UNIVERSITY OF CAPE COAST

# PSYCHOSOCIAL SAFETY CLIMATE AS PREDICTOR OF OCCUPATIONAL HEALTH AND SAFETY OF FUEL STATION ATTENDANTS IN ACCRA, GHANA

EDWARD WILSON ANSAH

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BY

EDWARD WILSON ANSAH

Thesis submitted to the Department of Health, Physical Education and Recreation of the College of Education Studies, University of Cape Coast, in partial fulfilment of the requirements for award of Doctor of Philosophy Degree in Health Promotion (Environmental and Occupational Health Promotion)

JULY 2017

## DECLARATION

### Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Signature …….. Date…….

Name: Edward Wilson Ansah

### Supervisors' Declaration

We hereby declare that the preparation and presentation of this thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:…… Date:…….

Name: Prof. Joseph K. Ogah

Co-supervisor's Signature …….. Date……..

Name: Prof. Joseph K. Mintah

## ABSTRACT

The purpose of this study was to determine the level of organisational psychosocial safety climate (PSC) among Oil Marketing Companies (OMCs) and their fuel service stations (FSSs) in Accra, explore the paths through which PSC predicts health and safety (H&S) of the attendants and the extent to which job resources (JR) and PSC mediate the effect of job demands (JD) on H&S of the attendants. The survey involved four purposively sample OMCs (Allied Oil, Goil, Shell and Total Petroleum) and 876 conveniently sampled attendants from these companies. An instrument derived from three pre-existing ones was used for data collection. The questionnaire yielded composite reliability between 0.91 and 0.95. Tools for the data analysis included One-way ANOVA, factorial MANOVA and SEM-PLS. The results revealed a general high risk (36.08) perceived PSC, with forecourt attendants having significantly higher risk perception ($M$ = 34.98, $SD$ = 12.47) than lube bay ($M$ = 37.61, $SD$ = 13.20). Also, ANOVA indicates a significant difference H&S status among the attendants by their OMCS, $F$ (3, 872), 6.14, $p$ = 0.01, Shell attendants ($M$ = 18.15, $SD$ = 5.77) reported poorer status than those at Allied ($M$ = 19.79, $SD$ = 5.81), GOIL ($M$ = 20.36, $SD$ = 5.97), and Total ($M$ = 20.34, $SD$ = 5.57). Further, PSC significantly and directly and indirectly, via the path of JR, predict H&S. PSC and JR are also partial mediators of the effect of JD on H&S of the attendants. Fuel station environment is posing a serious H&S threat to the total well-being attendants. Management needs to provide a strong safety leadership in all matters concerning the H&S of the attendants. The supervisors are also encouraged to increase their support for the attendants. A longitudinal study exploring changes in H&S of the attendants as PSC, JD and JR change over time is needed.

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## DEDICATION

To my wife, Ruth Abboah-Offei

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# CHAPTER ONE

# INTRODUCTION

## Background to the Study

Work is often associated with various hazards and risks that have the potential of causing harm to employees and property (Ana, & Sridhar, 2009). These harms have health and safety, economic and social effects (Clarke, 2010; Lanciano, & Zammuner, 2014). For this reason, the existence of occupational health and safety (OHS) aims at providing protection for workers. Further, worksite or OHS aimed at promotion and prevention of accidents caused by the unsafe worker behaviour and/or work environment. Besides, it is supposed to create a safe working environment that eliminates or significantly reduces identifiable inherent hazards, to protect the workers (Ostiguy, Roberge, Woods, & Soucy, 2010).

Over two million workers die worldwide each year from work-related diseases and accidents (Kanten, 2012). Additional 100 million estimated occupational injuries occur worldwide each year (Chau et al., 2008). However, the number of research conducted on health and safety is limited. For instance, in the last two decades less than 1% of organisational researches have focused on OHS issues (Mullen, 2004). But, most of these studies were conducted in developed nations (Dollard et al., 2012ab; Sadullah, & Kanten, 2009), where OHS policies have been formulated and effective implementations are ongoing (Clarke, 2010). Yet, most of these recent studies focused much on individuals' behaviours, rather than organisational factors. The above records give a cause for

concern, considering the health, social and economic consequences associated with poor OHS issues. The social and economic costs as a result of workplace accidents call that researchers critically study and understand better the events antecedents to work-related injuries as well as the organisational factors that affect an individual's safety and well-being (Mullen, 2004).

Job schedule such as working on shift bases is one factor that affects the health and safety of many workers. For example, safety is compromised for shift workers during the night (Bergh, Shahriari, & Kines, 2013). To illustrate this, Bergh and colleagues recorded among a large Swedish workers that shift workers at two different plants had significantly lower scores on all safety climate scales compared to daytime workers. In addition, shift workers had higher risk of exposure to dangers and experience the most injury events. Furthermore, Huang, Chen, DeArmond, Cigularov and Chen (2007) also revealed that a major accident like Three Mile Island, Chernobyl and Exxon Valdez, which killed hundreds of workers, occured at night and as such resulted of human error. Unfavourable work schedules like running shifts cause many ill health conditions including unstable psychological and emotional states (Marchand, 2007).

Previous research indicates that the experience of mental health concerns in the workplace differs according to industry, occupation and/or employment level. For instance, wholesale trade and transportation industries have been identified as industries at higher risk of poorer mental health than the average working population (Weiclaw, Agerbo, Mortensen, & Bonde, 2005). This is attributable to several night shift in these inductries (Marchand, 2007). Among these kind of workers, there is a lower level of safety climate perception compared to others without such experiences (Wu, Liu, & Lu, 2007). Besides, night work

deprives workers from quality sleep which is associated with psychological health problems (Occupational Safety and Health Administration, 2009). Problems including fire outbreaks, armed robbery attacks and customer abuse are also frequent in those industries (Ansah, & Mintah, 2012).

Traditionally, occupational safety research focused on identifying individual attributes such as personality traits, attitudes, and behaviours that are associated with accident proneness (Neal, & Griffin, 2006). In some cases, it concentrated on physical work environment and machinery effects in exposure, injury and other ill health state of the workers (Wills, Watson, & Biggs, 2009). This traditional paradigm is changing. Organisational climate is now identified as a mojor factor influencing the worker health and safety of many workers (Dollard et al., 2012a; García-Herrero, Mariscal, García-Rodríguez, & Ritzel, 2012). As an organisational factor, safety climate is commonly cited as a determinant of accident and injury occurrence (Yueng-Hsiang, Ho, Smith, & Chen, 2006), safety behaviour (Ansah, & Mintah, 2012; Clarke, 2010) and employee well-being (Dollard, Skinner, Tuckey, & Bailey, 2007; Kanten, 2013). However, psychosocial safety climate (PSC) is identified as an organisational factor that is driving the current research focus (Dollard, & Bakker, 2010; Dollard et al., 2012a). Thus, poor PSC provides the origin of the underlying causes of work stress and can lead to poor worker health and safety of workers (Abd Radzaz, & Bahari, 2013). PSC promises to be an effective organisational factor in determining worker health, safety and well-being (Bakker, & Demerouti, 2007; Dollard et al., 2012b), though, there is limited available research evidence to that effect.

Nevertheless, PSC draws relationships among organisational safety climate, worker psychological health, safety and well-being (Dollard, & Bakker, 2010; Dollard et al., 2012a). It has become an effective path for promoting worker health, safety and well-being (Law, Dollard, Tuckey, & Dormann, 2011). PSC is largely determined by organisational management which relates to specific organisational climate that influences the psychological health, safety and well-being of the workers. PSC is latent to psychosocial risk factors that pose psychological and physical strains that influence the health of the workers (Dollard, et al., 2012b; Iavicoli et al., 2014). Thus, PSC becomes a macro-level resource and safety signal for workers (Hall, Dollard, Winefield, Dormann, & Bakker, 2013).

Developing a robust organisational PSC safeguards the effects of workplace psychosocial hazards and builds environments conducive for worker psychological health and positive organisational safety behaviours (Dollard et al., 2012ab; Hall et al., 2013). According to Dollard and Neser (2013) high level of PSC can leads to improve worker health and safety, social and economic growth, in terms of national gross domestic products (GDP). PSC comprises management commitment, priority, participation and communication in safety matters affecting the workforce (Dollard, & Bakker, 2010; Law et al., 2011). Therefore, in small, medium and multinational organisations, senior management including safety committees or unions are relevant to promoting PSC (McTernan, Dollard, & LaMontagne, 2013). In this case, such management activities should aim at providing a conducive work environment for workers to build a positive safety culture or climate that serves the good of all workers (Dollard, & Neser, 2013).

Safety climate is a shared perception of workgroup members about management and workgroup safety related policies, procedures and practices (Lehmann, Haight, & Michael, 2009; Veltri, Pagell, Behm, & Das, 2007). But PSC is a more comprehensive concept that refers to an organisation's true priorities for the protection of worker psychological health, safety and well-being (Dollard et al., 2012ab; Hall et al., 2013). Hence, PSC relates to organisation's 'true' priorities given to policies, practices and procedures for the promotion and protection of health and safety of the workers (Dollard, & Bakker, 2010; Dollard et al., 2007). Further, it reflects management support for, and commitment to workplace health and safety. It manifects in organisational safety culture (Okoye, & Aderibigbe, 2014), which is a set of beliefs, norms, attitudes and social technical practices. The aim is minimizing the exposure of individual workers to conditions considered dangerous or injurious within and beyond the organisation (Okoye, & Okolie, 2013).

Organisational health and safety policies are the basis for providing workers with protective measures such as personal protective equipment [PPE] (Rickie, & Sieber, 2010). Such policies result in the formulation of and effectiveness of safety committee (Parker et al., 2009). The operationalization of such policies may result to effective bottom up safety communication (Lehmann et al., 2009). For instance, workers who perceived their management to have emphasized their well-being, and promote good human relations over productivity are more likely to report higher levels of safety climate and fewer incidents (Colley, Lincolne, & Neal, 2013). On the other hand, lack of attention to safety by senior management personnel significantly could relate to low frequency of reporting dangerous work procedures (Oltedal, & McArthur 2011).

Hence, appropriate OHS is required to effectively preserve, promote and protect the well-being of workers in all industries. More importantly, emphasis in promoting worksite health and safety must be put on those industries such as fuel and gas service stations that may pose high physical and psychological risks to their workforce (Dollard, & Bakker, 2010).

Workers in the fuel service stations, for example, are continually being exposed to various workplace hazards in the course of their duties. A recent study by Ansah and Mintah (2012) in the Central and Western Regions of Ghana found that fuel service station attendants (FSSAs) experienced various levels of hazards including fire outbreaks, robbery at gunpoint, vehicular accidents, major oil spillage, and customer abuses. Several similar incidences resulting in fuel attendants' deaths and grave injuries have been reported, including armed robbery (Olaotse, 2010), fire (Ghana News Agency, 2011), and violent acts from customers (Oduro, 2006). In another case recently, a fuel station disaster claimed the lives of more than fifteen fuel station workers and over 200 other individuals (Ghana News Agency, 2015). Moreover, workers in this industry are grappling with job insecurity, lack of decision autonomy, high pressure for timely service delivery, and very active interaction with customers of different behaviours (Smit, De Beer, & Pienaar, 2016). It is further observed that workers in such industries have ill health conditions like musculoskeletal disorders, injuries and psychological health problems including stress, burnout, depression and emotional exhaustion (Lanciano, & Zammuner, 2014).

Some work arrangements such as shift especially night and 24-hour shift have been linked to high rate of accidents and poor workplace safety behaviours (Okoye, & Aderibigbe, 2014). For instance, in the construction industry Okoye

and Aderibigbe found a significant disparity in the safety behaviours of casual and permanent construction workers on sites in Nigeria. This disparity was due to perceived difference in the level of management time at work, commitment to safety, safety obligations in terms of workers involvement, safety education and training. Unfortunately all these working arrangements are core job schedules in fuel service station industry (Ansah, & Mintah, 2012; Olaotse, 2010). Besides, most fuel attendants work 24-hours continuously dispensing fuel for more than a typical 40-hour work week (Udonwa, Uko, Ikpeme, Ibanga, & Okon, 2009). In addition, pump attendants relatively work under several compromising health conditions such as working without the use of nose guards, and under the sun, in the rain. They also work under adverse weather conditions because some of the service stations do not have canopy roofing (Santiago et al., 2014). Besides, they engage in refueling motor vehicles, cleaning vehicle windscreen, topping up brake fluid and engine oil (Monney, Dramanni, Aruna, Tenkorang, & Osei-Poku, 2015). These job duties have great potentials of exposing them to adverse health effects.

Fuel service attendants are also exposed constantly to volatile organic compounds (VOCs) such as benzene, lead, ethyl benzene, nitrobenzene, 1, 3-Butadiene, Ethylbenzene, n-Hexane, Toluene Xylene, majority of which are carcinogenic (Udonwa et al., 2009). A recent study about the quality of petroleum fuel imported and sole in some African countries (including Ghana) indicates that in addition to high levels of benzene, the sulphur contents are between 2000 to 3000 per part millions (Gueniat, Harjono, Missbach, & Viredaz, 2016). This level is more than 200% of the acceptable fuel quality, indicating that these young energetic men and women are also at higher risk of cardio-respiratory illness

health couple with already existence of high rate of workplace injuries (Breslin et al., 2008). However, since most occupational diseases manifest at later ages, exposure of young workers to adverse workplace conditions is a great public health concern (Gilbreath, & Karimi, 2012). Consequently, organisational productivity should not be placed above the health and safety concerns of such young workers (Winwood, Bowden, & Stevens, 2013).

Health and safety issues of workers are not only a product of management efforts (Okoye, & Aderibigbe, 2014) but centered on the wokers' safety practices (Ansah, & Mintah, 2012). Safety work practices such as effective use of appropriate PPE, observing operational procedures, offering assistance to other workers and reporting hazards to management need to be judiciously observed by every worker. Nevertheless, safety practices protect the workers first and foremost before any other auxiliary factor gains that protection (Bjerkan, 2010). According to Attfield et al. (2012), lack of self-protection contributes to the increase in the levels of blood lead and benzene among the workers. Therefore, appropriate workplace safety behaviour promotes the well-being of the workers and other individuals associated with the work environment. Besides, safety behaviours are facilitated by the attitude and safety behaviours of management towards worker safety (Ansah, & Mintah, 2012; Dollard, & Bakker, 2010). This suggests the reciprocal nature of wokers' safety behaviour and management safety practices to promoting employees' health and safety state.

The 21st century workplace is becoming more complex and diverse (Adei, & Kunfaa, 2007). This complexity challenges both managers and the employees on day-to-day basis. Management would have to grapple with business competition by introducing and/or improving technology. Perhaps, management

also has to compete with hiring and training new and existing workers and meeting regulatory standards, including those of health and safety (Puplampu, & Quartey, 2012). At the same time, employees may have difficulty with understanding and operating new and/or improved technologies as well as going through training to understand work processes and procedures. Besides, workers have to meet service delivery deadlines, face and manage clients with different characters and manage work-family conflicts (Duxbury, & Higgins, 2009). These situations present health and safety challenges, especially to the workforce, demanding that there be high level provision of psychosocial climate to facilitate institution of measures that would mitigate adverse health effects of work on workers (Dollard et al., 2012a).

The organisational safety climate literature has identified and is making a strong case for the PSC as the 'true factor' affecting health, safety and well-being of workers (Dollard, & Bakker, 2010; Law et al., 2011). PSC is an organisational management practice that involves management commitment and priority to health and safety, and senior management communication and participation in workplace safety. Accordingly, PSC runs front to and moderates the effects of job demands and job resources (supervisor support, co-worker support) in a typical organistional and worker group (Dollard, & McTernan, 2011; Hall, Dollard, & Coward, 2010). Furthermore, improving organisational PSC provides a buffer for work outcomes and worker health and safety. Besides, PSC influences work outcomes and worker health either directly or indirectly through the paths of job demand and job resources (Dollard, & Bakker, 2010). Thus, an organisation's true priorities for the protection its workers' psychological health, safety and well-being are largely reflected through enacted organisational

policies, practices and procedures in relation to health and safety (Dollard et al., 2012ab; Hall et al., 2013).

PSC is of health, moral and economic relevance to all stakeholders in the world of work (Clarke, 2008; Dollard et al., 2012a). Corporate safety climate describes shared values within an organisation and influences its members' attitudes, values and beliefs with respect to health and safety matters (Dollard, & Bakker, 2010). This shared perception is acknowledged as a strong force influencing workplace safety behaviour, accident occurrence, injury rate, workers' health and well-being (Dollard et al., 2012b; Wills et al., 2009). As a shared perception of employees, safety climate can be viewed as a snapshot of the prevailing state of safety in the organisation at a discrete point in time (Yueng-Hsiang et al., 2006). In line with this evidence, Lehmann et al. (2009) contend that the presence of a strong safety climate, such as open safety communication and strong leadership skills, produce the desire safe work behaviour necessary for the well-being among workers. There is also evidence that organisations with strong safety attitudes with management support for safety record low turn-over rate, low absenteeism and presenteeism, lower hospital expenses and worker compensation claims (Veltri et al., 2007). Additionally, strong organisational safety climate promotes increase in co-operation, worker confidence, productivity and corporate image of the organisation (Chau et al., 2008; Clarke, 2008).

An important mover of health and safety in every organisation is an explicit leader commitment to safety (Clarke, 2010; Dollard, & Bakker, 2010). Organisational safety climate components may include a focus on system improvement instead of blaming individual workers for mistakes, reporting

accidents and near misses, learning from errors and infrequent unsafe acts (Dollard et al., 2012ab). Defective safety climate has also been highlighted as one of the organisational causes of accidents. For example, an accident involving the space shuttle Columbia has been cited as evidence of high profile management compromise of safety issues (Thomas, Sexton, Neilands, Frankel, & Helmreich, 2005). Therefore, organisational safety perception is thus seen as an antecedent and "cause of cause" (p. 2) to worker safety and general workplace well-being (Dollard et al., 2012b).

The perception of safety among the workforce proved to be a precursor to employees' attitude towards safety (Kanten, 2013) that translates either to demonstrating health protecting or compromising behaviours (Abd Radzaz, & Bahari, 2013). Positive association between safety climate perception and healthcare worker compliance with safety regulations has been found. A worksite safety policy (Akpan, 2011), which a core element of PSC, promotes effective safety behaviours among workers that also safeguard their health, safety and well-being (Tsung-Chih, Chi-Wei, & Mu-Chen, 2007). Moreover, Ansah and Mintah (2012) recently documented that there is a positive high relationship between management safety practices and safety behaviours among fuel service station attendants. They observed a positive correlation between high management safety practices and positive safety behaviours among forecourt attendants at Central and Western regions of Ghana. This empirical evidence emphasizes the importance of organisational management in the promotion of the well-being of the worker (Dollard et al., 2012a).

Generally, unsafe work environments and worker behaviours are considered to be some key factors responsible for occupational accidents

(Sadullah, & Kanten, 2009). This classification acknowledges that the promotion of workers' health and safety places relatively equal responsibilities on both the employer and the employees (Clarke, 2008). Perception of organisational safety climate is also a critical determinant of an individual's behaviour in the workplace. Further, such perception mediates the relationships between objective characteristics of the work environment and the individual's response to this same environment. Besides, protective physical working environment is a significant determinant of safety performance, which promotes worker health and well-being (Bjerkan, 2010). Therefore, work safety requires that safe working conditions be provided to reduce risks significantly, especially for workers, such as the young and physically disabled individuals, who are deemed less fit for their jobs. This is because the aim of workplace health and safety is creating conducive working conditions, capabilities and habits that enable the workers and the organisation to carry out their work efficiently to avoid harm (García-Herrero et al., 2012). In this case, the attainment of such a health protecting work environment and the workers' health and safety rest predominantly on the organisation's PSC (Dollard, & Bakker, 2010; Dollard et al., 2012ab).

**Statement of the Problem**

Issues of workplace health and safety practices have received little research attention in the developing world to date (Alli, 2008). As a result, OHS has continued to remain outside mainstream organisational and management research. Most countries and industries scarcely recognise OHS practices as crucial determinants of organisational success and national development. Hence, mainstreaming OHS into institutions and national agenda must become an important consideration not only for the organisations in heavily industrialised

countries but also for those in the developing world (Katsoulakos, & Katsoulacos, 2007). The worst of it is that only a small number of the world's workforce has access to occupational health services for prevention and control of diseases and injuries caused or aggravated by work (WHO, 2013). But the challenges of availability and access to these occupational health services is even more in the developing countries (Clarke, 2010).

Apart from little research attention given to OHS issues in general, most African countries are struggling with OHS practices at industry and government set ups (Regional Committee for Africa Report, 2004). However, it is recorded in up-and-coming industrial nations that lack of OHS infrastructure, untrained and inadequate OHS professionals, lack of proper monitoring and surveillance for OHS diseases and injuries are key issues hindering the promotion of the health and safety of their workforce (Ministry of Health, 2012). This is an indication that workers in the developing nations including Ghana may be working in occupational environments that are injurious to their psycho-physiological health and well-being. Moreover, these developing nations record the highest and the most severe work-related accidents resulting in injuries, diseases and deaths (WHO, 2013). In recent times, exposure to psychosocial risk factors in work environments has also been strongly linked to mental health and well-being of workers (Fernandes, & Pereira, 2016). Therefore, working environments in such nations need more worker friendly interventions in the promotion of organisational PSC (Dollard et al., 2012b). These acts are believed to increase worker health and safety protection and promotion of the general workplace health and safety (Dollard, & Bakker, 2010).

PSC is an indicator of psychosocial hazards, psychological health problems and work engagement (Law et al., 2011). Positive PSC has a link with improved safety behaviour, well-being, general psychological health and safety (Dollard, & Bakker, 2010). PSC reveals the importance organisational leaders place on the psychological health of their employees. It comprises dimensions such as senior management commitment and support for stress prevention, and priority given to psychological health versus productivity goals. It further stresses the reciprocal communication concerning psychological safety and involvement of senior managers and workers toward psychological health and safety procedures (Dollard et al., 2012b). Such determinant of safety climate like safety management practice, is an antecedent to safety behaviour, worker safety orientation (Ansah, & Mintah, 2012) and psychological well-being (Law et al., 2011). For example, better perceptions of workplace safety climate is positively related to lower patients' safety indicators (Singer, Lin, Falwell, Gaba, & Bakker, 2009), self-reported injury rate (Clarke, 2010) and safety behaviours among fuel attendants (Ansah, & Mintah, 2012).

Ghana's discovery of oil in commercial quantity has brought about the proliferation and setting up of fuel service stations all over the country expecially in big cities like Accra, Tema, Kumasi and Takoradi (Ansah, & Mintah, 2012). This development has also brought about the increase in the number of employment in the sector. Such an increase in the rate of employment could result in the rise of physical and psychological work demands and their associated psychosocial health, safety and well-being challenges (Dollard, & Bakker, 2010). Statistical evidence from industry health and safety outcomes indicate that wholesale and retail trades (where fuel attendants and shop attendants belong)

have highest and third highest poor scores of 1.8 and 1.4 injury rate, respectively. Unfavorable physical and psychological demands of work result into occupational diseases, accidents, injuries and near misses (Winwood et al., 2013). These adverse effects increase the economic costs on the employees and employers (Tappura, Sievanen, Heikkla, Jussila, & Nenonen, 2014).

There are rampant fuel service station disasters in Ghana. These accidents are claiming the lives of the attendants and leaving many of other workers and customers severely injured (Ghana News Agency, 2015). For example, the June 3rd 2015 "twin disaster" climed about 159 lives including all the fuel attendants on duty. The remote cause of this was fuel tank leakage, which occurs in most fuel stations during delivery or the discharge of fuel into underground tank. To protect lives, the interim report recommended standardised training, certification and licensing of filling station attendants (Smith-Asante, 2016). This is an indication of the realization and acknowledgement of the hazards at the fuel stations and attempts to ameliorate that without research component. Besides, the fuels sold by these attendants contain high amount of sulphur (3000 ppm) and other VOCs that have acute and/or chronic debilitating effects on the health of these workers (Attfield et al., 2012; Gueniat et al., 2016). Therefore, the protection of these categories of workers is of greater concern now than ever. Perhaps, the first and the best approach towards this occupational health and safety challenges is research that facilitates the understanding of the interrelationships among related factors. The aim would be to develop and promote high levels of workplace safety climate in which the workers feel safe and protected (Avram, Ionescu, & Mincu, 2015).

Building of PSC lies with organisational senior management in every workplace (Dollard, & Bakker, 2010). PSC is mutually beneficial for all stakeholders to monitor, address and evaluate within organisations, and across each industry sector (Dollard, Shimazu, Nordin, Brough, & Tuckey, 2014) and country with differing cultures (Singer et al., 2009). Studies testing PSC in Western developed countries (Dollard et al., 2012ab) and few Eastern Asia countries have given evidence that PSC is an organisational factor (Idris, Dollard, & Winefield, 2011). It is this factor that promotes worker psychological health, safety and well-being (Law et al., 2011). However, very few research have tested the theory of PSC (McLinton, Dollard, Tuckey, & Bailey, 2014; Abd Radzaz, & Bahari, 2013). Even these studies are focusing predominantly on psychological health (Yulita, Idris, Dollard, 2016) neglecting OHS or physical health of the workers. Furthermore, in sub-Saharan African there is no available research evidence showing how the theory and its related constructs have been tested empirically in any organisation or population segment including fuel service stations attendants.

More importantly, only two studies have attempted to give some understanding into health and safety of FSSAs in Ghana (Ansah, & Mintah, 2012; Monney et al., 2015). The first ever study in Ghana by Ansah and Mintah investigated the safety measures of the OMCs as they relate to the safety behaviours of the attendants. They found very low provision of measures like PPE by the companies. These authors concluded that availability of adequate safety measures is important to increase safety behaviours among the attendants. The second study by Monney et al. explored health and safety standards, occupational hazards and health problems among attendants. Monney and

colleagues concluded that attendants are predisposed to "dire health risks due to their working conditions and require urgent measures" (p. 139) that protect them. Though, a good attempt, these two studies concentrated on attendants in Central and Western regions and Kumasi in Ashanti region. Thus, skewing the results and conclusions which could not cover or represent the vast majority of attendants and their companies in Ghana. Moreover, these studies failed to address the fundamental issues, such as PSC (Dollard, & Bakker, 2010; McLinton et al., 2014), confronting workplace health and safety in the developing nations in comtemporary times. In furtherance, WHO's Global Plan of Action (GPA) for workers' health (WHO, 2007) also stressed the need for workplace research evidence. Accordingly, such evidences are to support policy interventions, programmes and projects that are geared towards protecting and advancing the health and well-being of the worker (WHO, 2013). Besides, the Sustainable Development Goal (SDG) eight advocates for the promotion of sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (Osborn, Cutter, & Ullah, 2015). Apparently, these interventions towards decent work, health and safety and well-being of the workers could only be achieved when driven by empirical research evidences.

**Purpose of the Study**

The purposes of this study were to: (1) explore the level of organisational PSC among the Oil Marketing Companies (OMCs) at the fuel service stations (FSSs) in Accra, (2) test the paths through which PSC predicts worker health and safety of the fuel station attendants, and (3) determine the extent to which job resources and PSC mediate the influence of job demands on health and safety of the fuel service station attendants in Accra. The study futher hypothesised the

significant interaction effects between category of OMC and FSSAs on the perceived PSC levels and worker health and safety of attendants and that PSC, job demands and job resources would predict worker health and safety of FSSAs in Accra, Ghana.

**Research Questions**

The following research questions guided the study:

1. What is the level of PSC at OMCs and FSSs in Accra, Ghana?
2. What differences in PSC exist among departments of FSSAs in Accra, Ghana?
3. What differences exist in health and safety status of FSSAs from different OMCs in Accra, Ghana?
4. What interaction effects exist among categories of OMCs and different FSSAs on PSC levels and worker health and safety of attendants in Accra, Ghana?
5. To what extent do PSC, job demands and job resources predict worker health and safety of FSSAs in Accra, Ghana?
6. To what extent do job resources and PSC mediate effect of job demands on worker health and safety of FSSAs in Accra, Ghana?

**Significance of the Study**

Organisational psychosocial environment is recently identified as a major factor in determining the psychological health, safety and well-being of workers. This places much emphasis on organisational managers, than employees, to be responsible for "all" workplace conditions necessary for worker well-being and safety. Therefore, the findings of this study can assist employers, workers, workers' unions and their representatives, practitioners and policy makers in the

development of policy to reduce work stress and related injuries. This may improve work relationships between workers, their employers and other clients. Improvement in such relationships is likely to result to improve confidence of clients in FSSAs. And that promotes worker health, safety and well-being, improves productivity, cooperate image and overall business for the organisation (Hafner, van Stolk, Saunders, Krapels, & Baruch, 2015).

OHS is at an infant stage in most African nations, with Ghana at gestational stage. For example, Ghana as of now has no comprehensive OHS policy (Clarke, 2010). The findings of this study can be a reference point for advocating for a national comprehensive health and safety policy that advance the health, safety and well-being of the Ghanaian worker. The findings could also serve as reference material for developing and implementing both national and organisational health and safety policies for the Ghana's downstream oil industry. In the future, it can also be used to evaluate current and future worker injury prevention and intervention strategies or organisational worksite health promotion interventions.

There is limited literature exploring the theory of PSC and its closely related constructs. Also, there is yet no available literature on PSC from any nation in Africa. Hence, this study is likely to produce a psychometric data based on participants in Ghana and specifically for the fuel service station sector. This instrument will be useful for researchers in the field of OHS. It will also be essential for monitoring and diagnosis of PSC at fuel service station industry and other analogous industries in Ghana and other African nations.

## Delimitation of the Study

The study was delimited to using descriptive survey design to explore the relationships among PSC, job demands, job resources, and worker health and safety. It was further delimited to using only a survey instrument (questionnaire) for data collection. Thus, the study was delimited in exploring the concept of PSC and health and safety of the workers working in Accra. In addition, only means, One-Way ANOVA, MANOVA and structural equation model with partial least squared were statistical tools used for the data analysis.

The study was further delimited to surveying attendants working in OMCs in Accra, the capital city of Ghana. The population of OMCs includes Total Oil Company, Shell Ghana Limited, Ghana Oil Limited (GOIL) and Allied Oil Company. Moreover, only attendants working one year or above and were present at their service stations during the data collection took part in the study. Attendants involved in this included forecourt attendants, shop attendants or shopkeepers and mechanics. Besides, background data included in the research are age, sex, work experience and educational attainment.

## Limitations of the Study

I envisage that the results, findings and conclusions drawn from this study cannot be deemed to be the "absolute true" of PSC. In effect, making generalization based on the results of this study will be a limitation. This is because few purposively selected OMCs were part of the study. Thus, attendants from these OMCs may not be the true representations of the companies and their fuel service station attendants in Accra. Moreover, only those attendants in Accra took part and that these could not represent the characteristics and perception of those of the entire nation.

**Definition of Terms**

**Forecourt:** An open space either with or without roof where the sale of fuels such as petrol, diesel, kerosene and other products take place at the fuel stations (GOIL, 2010; Shell Australia, 2007).

**Fuel Service Station Attendants:** Includes all workers who sell petrol, diesel, kerosene, work (repair) on the vehicles at the fuel filling stations and those that sell items such as dresses, alcoholic beverages, and other household appliance in the shops (GOIL, 2010).

**Fuel Filling Stations/Filling Stations/Service Stations/Petrol Stations/Fuel Service Stations:** Established fuel dispensing stations where petrol, diesel, kerosene and various engine oils are sold to the public. Such stations also have convenience shops and lube bays where vehicles are repaired (GOIL, 2010; Shell Australia, 2007).

**Hazards:** A situation, condition or environment which has a potential to cause harm, damage, human injury or ill health or combination of these (Shell Australia, 2007).

**Lube Bay Attendants/Mechanics:** Are the fuel station workers who normally work or repair vehicles or wash cars.

**PPE:** All equipment (including clothing affording protection against the weather) which are intended to be worn at work and which protect workers against one or more risks to health or safety, e.g. safety helmets, gloves, eye protection, safety footwear and safety harnesses (Chilcott, 2007; Shell Australia, 2007).

**Presenteeism:** This is being at work despite poor or compromised health and performing below working capacity (Brown, Gilson, Burton, & Brown, 2011).

**Psychosocial Safety Climate/Safety Climate:** Includes 'policies, practices and procedures for the protection of worker psychological health, safety and well-being. It reflects senior management priority, commitment, participation and consultation in relation to stress prevention about the value of worker health and safety (Dollard, & Bakker, 2010). It is measured through the perceptions of the workers (Dollard et al., 2012ab).

**Pump/Forecourt Attendants:** Are the fuel station workers who normally sell at the forecourt.

**Risk:** The probability of occurrences of a hazardous event or exposure and the severity of injury or ill health that can be caused by event or exposure (Chilcott, 2007).

**Shop Attendants:** Fuel station workers who normally sell at the grocery stores or bars.

**Supervisor:** A person who helps the station manager and other station workers in the discharge of their duties. He or she also liaises between the manager and other workers (GOIL, 2010; Olaotse, 2010).

**Workplace Accidents:** They include accidents, assaults and abuses related incidents and illnesses resulting from work related stress (Sullivan, Seymour, McDermott, Hrymak, & Pérezgonzález, 2007).

**Organisation of the Study**

This study is organised under five separate chapters, one, two, three, four and five. Chapter one laid the background for the study, provided the problem

statement, purposes of the study, research question and hypotheses. It further, explained the significance of the study, delimitation and limitations and the definition of terms. The review of related literature is captured under chapter two. It took a critical look at the concept of occupational health and safety, prevalence of occupational health and safety problems, occupational health and safety response, overview of Ghana's downstream oil sector, some theories of occupational health and safety promotion, theoretical model PSC, the main theory underpinning this research. Besides, the chapter two literature has been reviewed on job demands, job resources and health and safety, interactions among PSC, job demands and job resources, factors affecting PSC and worker health and safety, conceptual framework and concluded with the summary. The plan for this research is provided under chapter three. This chapter involved the design, including the philosophical approach underpinning the study, population and sample descriptions, data collection instrument with its validity and reliability indices, data collection procedures and ended with statements about how data analyses were carry out. Meanwhile, as chapter four presented the results of the analyses and the discussions thereof, chapter five covered summary, the main findings, conclusions and recommendations.

# CHAPTER TWO

## REVIEW OF RELATED LITERATURE

The purposes of this study were to: (1) explore the level of organisational PSC among the OMCs at the fuel service stations in Accra, (2) test the paths through which PSC predicts worker health and safety of the fuel station attendants, and (3) determine the extent to which job resources and PSC mediate the influence of job demands on health and safety of the fuel service station attendants in Accra. The study futher hypothesised the significant interaction effects between category of OMC and FSSAs on the perceived PSC levels and worker health and safety of attendants and that PSC, job demands and job resources would predict worker health and safety of FSSAs in Accra, Ghana.This chapter presents a review of related literature that guides the study. The review of related literature is organised under the following headings:

1. Concept of Occupational Health and Safety
2. Prevalence of Occupational Health Safety Problems
3. Occupational Health and Safety Responses
4. Overview of Ghana's Down Stream Oil Sector
5. Theories of Occupational Health and Safety Promotion
6. Theoretical Model of PSC
7. Interactions among PSC, Job Demands and Job Resources
8. Factors Affecting PSC and Worker Health and Safety
9. Conceptual Framework

10. Summary

**Concept of Occupational Health and Safety**

Historically, the importance of worker health and safety has been acknowledged and documented early in the mid 1500 century (Jensen, 2005). Howver, the issues of the health and safety of workers became more pronounced during the industrial revolution. This period witnessed an upsurge in the demand for and number of people employed in the vaious industries (Asogwa, 2000). In addition, the industrial revolution has led to the introduction of many labour saving devices and different working methods. During this era, it is oberseved that workers were negligent and inexperienced in the use of working equipment. The era further broght about high work load on workers. However, due to the little or no experience in the use of these tools or devices, the workforce experienced a high rate of occupational accidents, injuries, illnesses and deaths. According to Jensen (2005), many workers worked under pressure to meet demands and satisfy employers. The increase in the rates of occupational incidences and accidents necessitated the attention to health and safety including worker safety behaviour (Zohar, & Luria, 2003).

There are hazards inherent in every work done by humankind. The hazards associated with work and workplace had been recognised over ages (Comaru, & Werna, 2013). Various hazards have a probability of causing accidents, injuries, near misses and/or diseases to the worker and workplace associates (Ana, & Sridhar, 2009). Moreover, hazards occur as a result of worker behaviours associated with work processes, work procedures or compliance with workplace policies or regulations (Gorman et al., 2013). Besides, work environments such as unguarded machinery, poor housekeeping, exposure to

harmful chemical compounds, poor lighting and ventilations pose various degrees of risk that can bring hazards to the worker (Clarke, 2010). These OHS problems do not only affect the worker, and their families; they also affect the company and the general society (Gahan, Sievewright, & Evans, 2014). Therefore, the need for worker protection becomes more a corporate social responsibility rather than an individual worker health protection issue.

According to WHO (2007), OHS establishes basic levels of health protection at all workplaces. The aim is to decrease inequalities in workers' health between and within countries and to strengthen the promotion of health at work. Accordingly, OHS ensures access of all workers to preventive health services. OHS further links occupational health to primary healthcare, and improves the knowledge base for action on protecting the health and safety of the workers. Furthermore, it promotes the health of workers and establishes linkage between health and work. Hence, OHS aims at procedures and processes that enhance positive workplace, as well as those that protect, preserve and promote the health, safety and well-being of the workers both at and off work. It becomes central to the total improvement of the working conditions for employees and any individual or group of individuals associated with work and the work environment (Alli, 2008; WHO, 2007).

OHS can also be described as a study of the interrelationships among work, workplace and the workers, and how such interactions influence human health, safety and well-being (IAPA, 2007). The field of OHS is vast and diverse. It includes but not limited to occupational health and safety management, ergonomics, health and safety risk assessment, occupational or industrial psychology, occupational engineering, occupational or safety hygiene,

occupational medicine, nursing and research (Dollard et al., 2012 abc; European Commission, 2013). In its specific term, health is the state of optimal or improved physical, psychological, emotional and environmental well-being of the worker. Safety can also be explained as the practice of preventing situations or conditions that inadvertently or by design, cause injury, ill health or death to humans in their working environment. Perhaps, the health and safety of workers become an inseparable entity that needs much more practical attention at the workplace and from management (Kirsten, 2010). Therefore, intensive and comprehensive safety programmes are needed to provide safe and conducive workplace for all workers (Punnett et al., 2013), irrespective of gender, age, education or social status.

OHS represents an important strategy that ensures the prove health, safety and well-being of workers. It further improves the productivity goals of both large and medium scale organisations (Songstad, Moland, Massay, & Blystad, 2012). Besides, it makes healthy workers become better motivated, enjoy better job satisfaction and contribute to yielding higher return on investment through productivity and service develivery (Gilbreath, & Karimi, 2012; Seidler et al., 2014). Therefore, OHS enhances the overall quality of life of workers, their families, the organisation and the society and should be underestimated, especially by employers and worker unions. In this regard, organisational senior managers have both moral and legal responsibilities to deliberately institute workable measures that protect the total health of each employee. On the other hand, employees are morally obliged to protect their own health and safety by complying with workplace safety rules and regulations including other measures (Clarke, 2008).

Occupational health and safety manifests in the safety measures that organisational senior managers put in place to safeguard the well-being of workers. Safety measures are deliberate practical actions taken by organisational senior managers to protect, maintain and promote health, safety and well-being of the workforce, both within and outside the work environment. Safety measures are manifestations of management support and priority for, and commitment to workers' health and safety. These safety measures are based on organisational participation and communication of safety (Dollard et al., 2012ab). They include safety risk assessment and management, safety policy and enforcement, safety training/education, provision of safety facilities and PPE (Rickie, & Sieber, 2010; Zohar, & Luria, 2003). The provision of such safety measures is a preventive strategy that employers use to safeguard physical and psychological health workers (Iavicoli, Cesana, Dollard, Leka, & Sauter, 2015).

In a typical organisation, safety measures may include instituting safety policies, forming workplace safety committee, supervising and/or enforcing compliance to these policies or regulations. In addition, providing for PPE and training workers in safe work procedures, and providing medical care including pre-employment medical screening and undertaking safety risk assessment and management improve safety (Boustras, & Hadjimanolis, 2012). These safety measures are interrelated. Thus, providing one safety measure (PPE) and neglecting other (enforcement) still leaves workers exposed to workplace risks. For instance, instituting safety policy or providing PPE without enforcing the policy for compliance or supervising workers to wear the protective devices, leaves much to be desired (Akpan, 2011). Also, the utilisation of PPE is important as their provision for health and safety of workers. In addition, enforcing

instituted policies without providing for other workplace safety measures such as training in safety procedures and providing safety facilities, to a large extent, demoralize and/or reduce safety behaviour of workers (Clarke, 2008; Occupational Safety and Health Administration, 2010). Therefore, the provision of safety measures should be comprehensive rather than fragmented.

**Prevalence of Occupational Health and Safety Problems**

Workers spend more than 60% of their waking hours at their various workplaces (Tan et al., 2014; World Health Organisation/World Economic Forum, 2008). Perhaps, work and work have environment become the most important factors affecting the life and well-being of workers (Morken, & Johansen, 2013). This is because there are inherent risks and hazards in every work. These risks may manifest by creating health and safety problems including injuries and diseases, some of which cause death, temporary or permanent disabilities (Hamalainen, Takala, & Saarela, 2006). The risks and hazards associated with work sometimes result in accidents, injuries that may lead to other ill health conditions. Occupational accidents are workplace events that may cause instantaneous injuries. Furthermore, occupational injuries are those damages to any parts of the body as a result of an events in the work environment. Such events may have either cause or contribute to the resulting condition or significantly aggravate a pre-existing health and safety condition (United States Bureau of Labor Statistics, Department of Labor, 2013). Some of these cases may be fatal with others resulting in absenteeism, presenteeism or transfer to another job. Others may be classified as near misses cases and not involve any lost days (Galizzi, & Tempesti, 2015).

Workplace accidents, injuries and ill health produce costs not only to the worker, their families and the employer, but such costs affect the general society (Dollard et al., 2012a; Gahan et al., 2014). Probably, the employer bears the least of these costs. The results of Hassan et al.'s (2009) study confirmed this observation. They discovered that between 2001 and 2002, Great Britain recorded workplace accidents and work related-ill health to society as 20.0 to 31.8, to the worker, 10.1 to 14.7, and to the employer, 3.9 to 7.8 billion pounds. Pathak (2008) therefore, believes that, for share of workplace accident costs by employers, they will be less motivated to adequately provide for the health, safety and well-being of their workers. Hence, there is the need for all stakeholders in the world of workplace health and safety to make concerted efforts for the promotion of health, safety and well-being of the worker.

Efforts towards having national policy, regulations should influence organisational or workplace health and safety policies and regulations. It should further lead to creating a strong and active institution that implements these policies and regulations. In addition, the policies need to translate into worksite health and safety committee, effective management support for workplace health and safety (Bond, Tuckey, & Dollard, 2010). In the same vien, it should aim at increasing supervisor and co-worker support (Okoye, & Aderibigbe, 2014), enforcement activities, safety training, provision of appropriate safety PPE and devices (Dollard et al., 2014; Kanten, 2013). The effects of these are reduced near mises, accidents, injuries, illness, dealths, low turnover rate and compensation cliams, increase worker morale, productivity and financial returns (Becher, Dollard, Asia Pacific Center for Work Health and Safety, WHO Collaborating Center in Occupational Health & University of South Australia, 2016).

**Global levels of occupational death and injury statistics.** International Labour Organisation's (ILO) on worker health and safety statistics reveal that over 2.3 million workers die from about 300 million accidents globally each year (ILO, 2017a). These are as a result of work-related accidents ending up in injuries and diseases annually (Nenonen et al., 2014). Simply, a worker dies from work-related accident or disease while 153 workers encounted a work-related accident in each 15 seconds worldwide. Again, over 317 million accidents occur at workplaces annually, many resulting to extended absence from work (ILO, 2017b).

The economic cost of these on the job deaths, injuries and diseases according to the ILO (2017a) is estimated at 4% of the global GDP. Furthermore, a study to explore the relationship between reported levels of work stress and economic performance in 31 European economies indicated that, after controlling for other determinants, worker health accounted for 13% of the variance in GDP across the study countries (Dollard, & Neser, 2013). Workplace injuries alone accounted for about 10% of the Global Burden of Disease (GBD) in 2013 (Haagsma et al., 2015). A more recent statistics also revealed about 973 million people sustained injuries that warranted some type of health care and treatment (Gahan et al., 2014) and that 4.8 million of the people died.

According to Nenonen et al. (2014), 3.2% of Singaporean's GDP is contributed to by work-related accidents. ILO estimates also noted that over 12 million men and women from developing countries become victims of occupational accidents each year. Each year, 3.2% of European workers also report various forms of accidents. That is, approximately 6.9 million workers get involved in different kind of accidents at work (ILO, 2006). Additionally, about

8.6% of the workers in Europe experience work-related health problems annually. Thus, each year, not less than one out of ten European workers suffer accidents at work (Van den Broek, De Greef, Van Der Heyden, Kuhl, & Schmitz-Felten, 2011). Other studies have estimated global annual work-related diseases and accidents at two million (Kanten, 2012), with 100 million additional occupational injury occurrence (Chau et al., 2008).

In Russia for example, about 190 people die each year due to working in hazardous conditions, 15,000 are due to occupational accidents. Russian workplace statistics revealed that 180,000 people are forced to early retirement due to work-related accidents and diseases (ILO, 2005). Safety statistics from Bangladesh also indicates that of 465 workers who lost their lives, 211 worked in the formal sector while 254 were with the informal sectors. It further reveals that out of 444 injured workers in 2014, 349 involved formal sector workers with 95 informal workers coming from different workplaces. These deaths and injuries affected 847 male workers and 57 females (Bangladesh Occupational Safety, Health and Environment Foundation, 2014). In effect, these statistics provide the occupational health and safety professionals with international, regional, national, industrial and population specific occupational death, injury, diseases and near misses rates (Galizzi, & Tempesti, 2015).

There are varying degrees of occupational accidents resulting in many deaths and injuries of workers all over the world. Available data indicated that there were about 45, 550 accidents and cases of ill health resulting in more than three days absence from work in 2004 (Nenonen et al., 2014). In 2005, over one million injuries were sustained by workers in the United Kingdom (UK) from which nearly 25,000 workers were forced to resign due to resulting injury or ill

health. This results in about 40 million lost working days. Additional estimates from Health and Safety Executive (2008) indicated that in 2006, 2,056 deaths associated with mesothelioma occurred. Besides, work-related lung cancer killed 250 workers the same year in UK. Employers cannot continue to neglect the health and safety of their most important resources if productivity and society will have to develop (Kaynak, Toklu, Elci, & Toklu, 2016).

Workplace accidents, injuries and ill health situations produce high cost to stakeholders and industries. The costs associated with occupational accidents and ill health do not only affect the workers, and their employers (Sullivan et al., 2007), but they also affect families and the society in general (Mossink, & De Greef, 2002). Globally, workplace accidents cost employers between £3.3 billion and £6.5 billion each year. Of the global accidental costs (GAC), between £910 million and £3710 million is accounted for by accidental damage to property and equipment. Mottiar (2004) estimated that in 2002 alone, the overall cost of accidents and ill health in the European Union was about €20 billion and approximately €171 billion in the U.S. Moreover, in the financial year 2006/07, £393 million was lost in the whole Britain civil service sector as a result of work-related injury absences. This brings the cost per staff per year to about £887.66 million (RED Scientific Limited, 2007), a huge loss affecting the organisational productivity and growth (Kaynak et al., 2016). Furthermore, recent health expenditure data from US shows an increase over the years (Dieleman et al., 2016). This data further reveals that between 1996 and 2013, $87.6 billion was spent on low back and neck pains which accounted for the third highest healthcare expenditure. More than 75% of the occurrence of these health conditions is attributable to work settings (Martimo et al., 2007).

Due to the extreme financial loss associated with workplace accidents, it is difficult to convince employers and other decision makers of the financial benefits of workplace accident prevention (Mossink, & De Greef, 2002). Mossink and De Greef reasoned that the neglect may be due to the economic consequences of accidents being difficult to calculate. This in most cases results in the underestimation of the financial costs and losses associated with occupational accidents and ill health. For example, the annual costs of Irish workplace accidents and ill health has been estimated between €3.3 and €3.6 billion. Irish industrial specific workplace accidents and ill health cost data also show that construction, mine and quarries and agriculture and forestry lost €17,000, €8,700 and €2,000 respectively (Dalley, 2005). However, Dalley believed that the figures could be higher than these, thereby creating big loses to industry players. Occupational accidents causing deaths, injuries, and other related problems are not affecting workers only but their employers are bearing large among of costs. Thus, if employers aim at increasing productivity and have competitive market advantage, they need to place worker health and safety first over productivity.

**Regional levels of occupational injury and death statistics.** Occupational health and safety is believed to be poor in the developing countries (Diugwu, Baba, & Egila, 2012; Umeokafor, Umeadi, & Jones, 2014). Occupational accidents figures are increasing annually, with the developing countries bearing most of the brunt (Machida, 2009). Workers in these third world countries are believed to be more exposed to occupational risks or hazards. According to Nenonen et al.'s (2014), work-related illness estimates among WHO regions, low and middle income African countries topped occupational injuries and communicable diseases. Also, workers from these countries

disproportionately suffer the burden of occupational health problems (Mottiar, 2004). Despite these, there is a paucity of recorded workplace accidents, deaths, injuries, near misses and disease statistics in these countries. Thus, few estimated statistics are believed to be largely under reported. Additionally, such data are skewed against many industries and population segments (Comlan et al., 2009).

According to estimated occupational accident figures, Africa countries have more than 54,000 fatal occupational accidents annually. In addition, approximately 42 million work-related accidents took place that caused at least three days' absence from work in 2012 (Nenonen et al., 2014). Accordingly, the regional accident rate is about 16,000 per 100,000 and the fatality rate of 21 per 100,000 workers (Olowogbon, & Jolaiya, 2012). Moreover, 5% of adult blindness in the developing nations is associated with work-related injuries (Addisu, 2011). Comlan et al. (2009) also identified a total of 825 work-related accidents in Gabon between 2007 and 2008, of which about 45% occurred in 2007 and 55% in 2008, with 89% affecting men. These authors also recorded 49% open wound, 37% traumatic injuries and 18% bone, nerve and spine injuries. These statistics as reported by Comlan and colleagues indicate an increasing trend, with more than women being at risk at their workplaces. These increasing figures pre-suppose that worker health and safety is not being given the attention they deserve. These figures may be translating into less productivity and worker job dissatisfaction (Dollard et al., 2012bc).

There are vast differences in the occupational accidents figures among nations in Africa. According to Machida (2009), in 2007, Algeria and the Republic of Zimbabwe recorded 40,423 and 5,516 accident cases, out of which 697 and 62 workers lost their lives, respectively. According to her, many

countries in 2004 reported various different workplace problems such as Mauritius 2,743 cases, one death; Nigeria 53 cases, one death; Togo 397 cases, 10 deaths and Tunisia 43,317 cases with 155 deaths. Again, Machida underscored that most of these figures were from insurance claims and were therefore likely to be underestimated. Moreover, there are many out-of-court settlement of insurance claims. And that, in most of these nations, OHS decisions cannot be made based on workplace accidents reported data.

In some other nations in Africa, several deaths, injuries and diseases affect many and diverse groups of workers. In Tanzania for example, two separate reported accidents claimed the lives of 50 workers and injured several of others in 2013 (Ngowi, 2013). Ngowi is of the view that several of such cases went unreported and victims and their families suffered the consequences. In Kenya Republic, over 245,850 workers lost their lives to work-related injuries and diseases in 2010/2011 estimate year. Report indicates that about 263 Kenya workers died while 24, 024 others sustained various degrees of injuries in the same year as a result of work-related accidents. Moreover, over 186,549 Kenyan workers lost their lives to many diseases occurring in the various employment sectors (Hämäläinen, Saarela, & Takala, 2011). Nigeria for instance is described as the "problematic state" in terms of occupational accidents (Umeokafor et al., 2014).

According to Umeokafo et al. (2014) five, eight and fourteen injuries and one, two and four deaths occurred in Nigerian workplaces in 2010, 2011 and 2012, respectively. These accident statistics represent largely under-reported cases in Nigeria and many other developing nations. Umeokafo et al. are of the view that under-reporting of workplace accidents cases may be as a result of weak

OHS regulatory systems in Nigeria. Thus, OHS system in the developing countries should be strengthened not only for the health and safety of the workers, also to provide for appropriate accidents calculating and reporting.

**Occupational death and injury statistics in Ghana.** There are many workplace accidents resulting to injuries and death in this country, Ghana. These bring untold hardship not only to the victims, families and the organisation they work for, but also they affect the national economy. For instance, the Ghana Institute of Safety and Environmental Professionals (2013) asserted that the cost of workplace injuries and deaths could be as high as 10% of Ghana's GDP. In specific terms, a descriptive study among 500 mechanics in Cape Coast Metropolis revealed a high prevalence of injuries (Abu et al., 2015). Abu and colleagues reported that about 40% of the mechanics suffered eye injuries, attributable to non-usage of eye protective devices. A similar study by Addisu (2011) showed an increase in workplace injury and death rates. Accordingly, 80% occurred at night while manufacturing accounted for 53.8% with 63% deaths. Besides, fire resulted in 53% of the deaths, while management factors accounted for 91.3% injuries.

**Occupational death and injury statistics in the fuel service station industry.** Fuel stations in the developing countries are particularly hazardous working environments. Service station attendants are exposed to greater and more risks on daily basis. The attendants are exposed to stream weather condition, armed robbery attacks, fires and adverse psychosocial situations (Ansah, & Mintah, 2012; Olaotse, 2010). Exposure of the attendants to fuels containing carcinogenic compounds is a common knowledge. For instance, lead poisoning is one major and unreported cases among this segment of informal workers in the

developing countries. An empirical study by Onunkwor, Dosumu, Odukoya, Arowolo and Ademuyiwa (2004) revealed the mean blood lead concentrations of the male petrol station attendants and the auto-mechanics to be 2.81ug/ml whereas that of females were 2.85ug/ml.

FSSAs are exposed to more and complex hazards as a result of poor maintenance, carelessness, poor housekeeping, mechanical fault and robbery (Ahmed et al., 2005; Olaotse, 2010). Through refueling of vehicles, washing windshield, checking fluid level, air pressure and replacing tires, light bulbs and windshield-wiper blades of vehicles, FSSA are exposed to volatile organic compounds (VOCs) such as benzene, ethyl benzene, nitrobenzene 1,3-Butadiene, Ethylbenzene, n-Hexane, Toluene Xylene (Udonwa et al., 2009). VOCs are reported to cause, individually and in combination, notable changes in the hematological parameters of red blood cell morphology of fuel attendants from Bangkok Taiwan (Tunsaringkarn, Zapuang, & Rungsiyothin, 2013). In addition, Benzene causes hematological effects that ultimately may lead to anemia, and to the development of acute leukemia. Tunsaringkarn and colleagues found among their participants that 27.6% of their abnormal red blood cells were hypochromic. Furthermore, the fuel attendants' job operations involved frequent standing, walking and handling of heavy weighing objects, with weight up to 6.8 kg (15 pounds). They also work outside in all kinds of weather exposing them to cuts and burns (Ansah, & Mintah, 2012). These and many of their duties are potential risk sources and can lead to health damage if appropriate measures are not put in place.

In the developing countries such as Nigeria and Ghana, petrol stations are still largely dispensed by fuel station attendants. This form of sale expose the

workers to far more than 23mg/m3 limit for a 10-hour work day in a 40-hour work per week. This 24-hour continuous dispensing of fuel exposes the attendants to VOCs for more than a typical 40- hour work week (Udonwa et al., 2009). Again, available evidence revealed that continuous exposure to such volatile chemical compounds compromises human reproductive health. Exposure to these compounds causes many illnesses such as cancer, cardiovascular diseases, respiratory disorders, accidental poisoning, musculoskeletal disorders, digestive disorders, mental disorders, and skins disorders (Attfield et al., 2012; Valentic, Stojonovic, Micovic, & Vulcolic, 2005). Valentic et al. found respiratory disorders, accidental poisoning, musculoskeletal disorders, digestive disorders to be more common, compared to cardiovascular diseases, among oil workers. They argued that cardiovascular diseases may be rare because a majority of the workers are young between 25 and 30 years (Ansah, & Mintah, 2012). In Ghana, Monney and others in 2015 reported that 99% fuel service attendants from Kumasi are exposed to extreme weather conditions, 98% inhale vehicle exhaust fumes, 98% to petrol vapour and 88% fire outbreaks. They further indicated that these workers suffer work-related illness such as musculoskeletal disorders ($n$ = 141), low-back pain ($n$ = 81), headaches (62) and dizziness (36).

Furthermore, their jobs attendants are vulnerable to psychological stress such as burnout and depressions (McTernan et al., 2013). For instance, Bresic et al. (2007) found among 125 Croatian oil workers that they face many stressful work conditions. Compared to laboratory and office workers, Bresic et al. identified that oil workers were stressed by work overload, overtime and shift-work including night shift. Unpredictable weather conditions, the presence of fire and chemical hazards are also associated with such workers. Fuel attendants may

probably face worsened work stress conditions in Ghana. Ansah and Mintah (2012) documented that some attendants work long hours, run shifts including night shifts, experienced fire outbreaks, major oil spillage and are abused by customers. Thus, safety becomes a problem at night especially when workers work long hours before the night (Rotenberg, Griep, Fischer, Fonseca, & Landsbergis, 2008).

Exposure to low chronic doses of petrol vapour can be irritating to the eyes, respiratory tract, skin and neurocognitive functioning (Attfield et al., 2012). In addition, exposure to higher concentrations of petroleum vapour, which contains benzene and other harmful compounds, may produce central nervous system (CNS) effects such as staggered gait, slurred speech and confusion or cancer in the long term (WHO, 2010). Again, rapid unconsciousness and death due to respiratory failure may also result due to exposure to petroleum compounds at very high concentration (Boschetto et al., 2006). Prolonged dermal exposure to petrol fumes or inhalation of the vapour has also been associated with renal dysfunction, lipid degeneration and other clinical manifestations such as haematuria, proteinuria and myoglobinuria. Additionally, the likelihood of developing cardio-respiratory conditions like emphysema, asthma, and cancer such as lung cancer increases as a result of prolong exposure to diesel exhaust (Attfield et al., 2012) is very high. Attendants are also exposed to oil fumes such as diesel fumes containing nanoparticles (Ostiguy et al., 2010).

Nanoparticles are compounds known for their exceptional physical, chemical and electrical properties through which they may cause pulmonary inflammation, tissue damage and lung tumors among workers (Ostiguy et al., 2008). These workers are aslo most likely to have low and defective sperms as

the results of the exposures to the fumes (Moline et al., 2000). Moreover, where their pregnant wives may be anemic and experience miscarriage as a result of re-exposure (Crain et al., 2008). Additionally, children may be petro-chemically intoxicated resulting in anemia, bone and cardiovascular defects (Walter, & Moller, 2014), if these fuel attendants are not observing proper hygiene.

It is also reported that continuous exposure of fuel FSSAs to hazardous materials at filling stations calls for concerted efforts by employers to protect and promote the health and safety of these workers. It is important for all FSSAs to be educated about health risks of exposure to benzene (and other products contained in petrol fumes) found in petrol products. The acquisition of knowledge may trigger a self-protective attitude among the attendants. Attendants need to be trained to respond appropriately to emergencies (fire, armed robbery), and to situations common to their work (Health and Safety Executive, 2010). In addition, fuel attendants need to go about their activities by observing good hygiene practices such as keeping their hands and clothes clear from the spillage of petrol fuels, and washing their hands before meals. They also have to stand upwind when refueling vehicles and also using PPE such as gloves and disposable masks (Chawla, & Lavania, 2008). Moreover, FSSAs need to avoid direct contact with petroleum products from every route of exposure such as inhalation, ingestion and absorption by the nose, mouth and the skin respectively (Shell Australia, 2007).

In Ghana, fuel attendants have been reported to face many workplace incidences including abuse, major oil spillage, flood, fire outbreaks, and armed robberies (Ansah, & Mintah, 2012; Monney et al., 2015). Some others were raped while some experienced vehicular accidents. For instance, the recent “twin

disaster" (of fire and flood) claimed 159 lives including all the attendants in that service station in Accra (Ghana News Agency, 2015; Smith-Asante, 2016).

**Occupational Health and Safety Responses**

Worker health and safety should probably be the most important health concern for all in the world. Globally, labour is regulated by the ILO, in collaboration with WHO. The ILO and their collaborators institute standards, treaties, conventions, guidelines, regulations and programmes by which worker health and safety is promoted (Jensen, 2005; ILO, 2017c; WHO, 2007). Many nations responded to the health, safety and well-being of their workers in their national constitutions and policies. Besides, nations establish agencies and regulatory institutions that oversee the protection of the health and safety of the worker (Puplampu, & Quartey, 2012; The Constitution of the Republic of Ghana, 1992). In a similar manner, organisations, institutions or industries provide for workers' health and safety with workplace policies, regulations and programmes. Also, to effectively upscale worker protection, industries form committees and organise worksite health and safety programmes (Parker et al., 2009).

Ghana's responses to workers' health and safety issues are provided in its constitution and other regulations and their accompanying implementing institutions. The 1992 Constitution of Ghana provides every Ghanaian worker the right of working under safe and healthy conditions. Article 24 of the constitution, which falls under the Human Rights Provisions states that, "every person has the right to work under satisfactory, safe and healthy conditions" (p. 23). Again, the constitution in Article 36(10) provides that, "the state shall safeguard the health, safety and welfare of all persons in employment" (p. 35). Unfortunately laws and

regulations put in place to ensure this protection is ensured are in most cases ineffective.

The relative industrial and commercial growth in Ghana has increased employment rates. The industrial and commercial activities also bring advanced technology, complex work processes and procedures. These changes potentially expose workers to various forms of accidents, injuries, disasters, and occupational health diseases (Adei, & Kunfaa, 2007). These occupational health and safety adversities are global phenomena that occur at any time to any worker or group of workers (Annang, 2014). Therefore, there is the need to put proper OHS measures in place to safeguard the health and safety of workers. However, the formulation and implementation of these measures are hinged on the national OHS policy (Clarke, 2008). Perhaps, the national OHS policy and/or regulations become the backbone of very nation's or organization's attempt to safeguard the health, safety and well-being of their human capital (Annang, 2014).

Ghana does not have such national comprehensive OHS policy (Clarke, 2008). Not only is there the absence of national health and safety policy, but also the existing policies are fragmented and scattered under different jurisdictions and organisations. Besides, no single constituted national institution or body, by legislative instrument (LI), is responsible for the development and implementation of OHS standards and guidelines across all businesses (Annan, 2011). Annan also observed that, "Ghana has no or unclear national targets and objectives to guide health and safety across all sectors of the economy" (p. 13). Besides, there seems to be a low level of ratifications of ILO Conventions that address OHS in its member states (Annan, Addai, & Tulashie, 2015). As a result, there is inadequate resource allocation to OHS research, ineffective OHS

inspection, OHS training and education and OHS capacity building and monitoring (Puplampu, & Quartey, 2012).

The fragmented and outdated OHS policies and regulations that currently give some sought of legal backing to addressing Ghanaian workers' health and safety include: The Factories, Offices and Shops Act (328 of 1970), Workmen's Compensation Law, (Act 187 of 1987), and Labour Act (651 of 2003). There are also different institutions and bodies mandated with various policies, regulations and acts of law with accompanied LI for the protection of health and safety of the Ghanaian worker (Adei, & Kunfaa, 2007; Annan, 2011). Among these institutions include Inspectorate Division of Minerals Commission (LI 665). Their roles are to monitors and controls OHS activities in the mining industry. The Environmental Protection Agency backed by EPA Act 1994 (Act 490) is another. They controls and monitors the implementation of environmental management issues. The Ghana Labour Commission (Labour Act 2003, Act 651, Workman's Compensation Law 1987) that also controls industrial relations and employee wellbeing. The rest are Radiation Protection Board of Ghana Atomic Energy Commission (LI 1559, 1993; Act 204 of 1963). Their mandates include controling the importation, use and disposal of radiation sources and material. The Department of Factory Inspectorate (Act 328, 1970) which also controls OSH in shops, offices and factories (Annan, 2011).

The national health and safety policy underscores the importance a nation attaches to the welfare of their workforce. Meanwhile, a healthy workforce becomes a productive force that contributes, in significance terms, to both social and economic development of nations (WHO, 2007). There is an urgent need for the promulgation of a comprehensive national health safety policy in Ghana

(Annan, 2011; Annang, 2014). Such a policy represents the legal document that mandates employers to take proactive steps to preventing, preserving and promoting the safety and well-being of the workers. The OHS policy spells out measures such as conducting periodic safety risk assessment and management at worksites, providing medical insurance, providing training or education and the necessary safety facilities and equipment for the workers (Puplampu, & Quartey, 2012).

A health and safety institution or organisation is necessary to oversee the implementation of this national policy. Establishing such an organisation is a core element in the national health and safety policy. The mandates of such a body involves conducting researches and workplace safety inspections, and providing training and educating both workers and employers. Where necessary, the Health and Safety Institute (of Ghana) will have the legal backing to prosecute organisations defaulting in the health and safety issues of their employees (Annang, 2014). These technical duties would mean establishing a well-resourced institute, in terms of materials, finance and personnel, if health, safety and well-being of workers are to be safeguarded. In addition, the institute must be backed by a strong and effective LI upon which personnel can execute their mandates of OHS (Annan, 2011; Annan et al., 2015).

Evidence across different cultures and economics have proven that interventions for workers' health and safety are not only for workers protection. They are intended for business and productivity and they give corporate competitive advantages to such organisations. Also, they are corporate social responsibility matters that serve the image and drive organisations (Alli, 2008; Songstad et al., 2012). Worker health promotion is afore to profitability and

positive corporate competitive advantage for “a healthy worker is a productive worker”. Therefore, for nations to effectively and progressively develop in all their sectors, the health and safety of their workers must be paramount. This achievement rests in the National Health and Safety Policy (Annan et al., 2015; Puplampu, & Quartey, 2012).

**Overview of Ghana’s Down Stream Oil Sector**

Until the offshore discovery of crude oil in commercial quantities in July 2007, Ghana’s oil industry featured more prominently in the downstream sector. However, with the recent discovery and commencement of crude oil production, Ghana’s oil and gas industry can now be categorized into the upstream and downstream sectors. The upstream sector covers the exploration, development and production of crude oil and natural gas. The downstream sector covers the refining, storage, internal transportation, marketing and sale of petroleum products including petrol, liquefied petroleum gas (LPG), diesel and kerosene (Prempeh, 2010).

The downstream oil sector in Ghana dates back to the colonial era. This era experienced only expatriate OMCs such as Shell Ghana Limited, Texaco Ghana, British Petroleum Ghana Limited, Mobil Ghana Limited and Total Oil Company Limited. These OMCs imported, distributed and sold fuel and fuel products in the country. In addition, they built fuel service/filling stations in various cities and villages where they distributed and sold petroleum products to the motorists (Prempeh, 2010). Aside trading in vaarious petroleum fuels, the OMCs also trade in other fuel products including lubricants, car care products, car wash bays and convenience goods (Total Petroleum Ghana, 2010). The selling

of these petroleum products at the various service stations across the country is being done by these attendants (Ansah, & Mintah, 2012; Olaotse, 2010).

Many OMCs came to the fore of oil marketing in Ghana just after independence and recently (in 21st century) because of economic growth and expansion in country's oil industry (Prempeh, 2010; Total Petroleum Ghana, 2010). Many companies, both local and foreign, joined in for oil marketing in the face of this expansion. These companies operated as a loose organization for many years until in October 2003 when an Association of Oil Marketing Companies (AOMCs) was established. The association has the mandate to promote the interest of their members and that of their customers.

Currently, there are about 40 licensed OMCs in Ghana (AOMCs, 2011ab). These companies have over 2,000 licensed retail outlets all over the country. Some of the companies include Agapet Oil, Allied Oil, Anasset Oil, AP Oil & Gas, Bano Oil, Capstone Oil Ltd, Champion Oil, Dukes Petroleum, Engen Ghana Ltd, Excel Oil, Fraga Oil, Frimps Oil, Galaxy Oil, Ghana Oil, Glory Oil, Havillah Oil, Keysens Oil Market and Manbah Gas. The rest include Merchant Oil, Modex Oil, Nasona Oil, Oando Ghana, Obiba J. K, Pacific, Shell Ghana, Sky Petroleum, Star Oil, Sonnidom Energy, Strategic Energies, Superior Oil Co, Top Oil, Total Petroleum, Trade Cross, Trinity Oil, UBI Petroleum, Union Oil, Unity Oil, Universal Oil, and Virgin Petroleum. A lot more of these OMCs are coming up and with their outlets each passing time.

The OMCs in Ghana engage mostly young energetic males and females as sales girls and boys in the convenience shops or marts in African countries (Olaotse, 2010; Total Petroleum Ghana, 2010). In the convenience shops or marts, products from break fluids to insecticides and to groceries are sold. In

addition, pump attendants attend to customers at the forecourt at the services stations. These attendants also check brake fluid, engine oil, water level and they wash windscreen of vehicles. Furthermore, most of the stations have lube bay services where in most cases, young mechanics are employed to service vehicles. Most of these stations operate on a 24-hour basis with the pump attendants and the sales girls running shifts within groups.

The fuel stations are mostly owned and operated by OMCs but few of such stations are owned and operated by individuals called dealers under the various OMCs (Shell Australia, 2007). Each of the station is headed by a manager, assisted by station supervisor(s) who are in charge of the day-to-day running of the station. These outlets can be found all over the cities, towns and villages in Ghana with the majority and bigger stations found in the big cities like Accra, Tema, Kumasi, Takoradi, Tamale, Cape Coast and Ho (AOMCs, 2011b; Total Petroleum Ghana, 2010).

**Theories of Occupational Health and Safety**

Theories and/or models are tested assumptions that drive research for ages. They are the basis for stating and testing research hypotheses. As practiced in many disciplines (Hair et al., 2014a; Wong, 2013), the field of OHS or workplace health and safety promotion usually utilizes theories from organisational and industrial psychology (Dollard, & Bakker, 2010), health or health behaviour (Rogers, 1985; 1975). Some of these theories and models include: the 3 Es of safety, protection motivation theory, job-demands resource model, human factors theory of accident causation and epidemiological theory of accident causation. Others include systems theory of accident causation, behavioral theory of accident causation, depression and accident causation, and

management failures and accident causation. The tenets of some of these theories are presented in few of the pages that follow.

**The 3 Es of safety.** The 3 Es of safety is the theoretical model of safety that comprises engineering, education and enforcement of safety and is aimed at promoting the well-being of workers. This safety philosophy has been adopted and used by employers and safety practitioners in many industries since the early 1900s. It also provides a guide to workplace safety-related interventions for many decades (Blakely, 2009).

The first E in the concept focuses on developing engineering strategies that decrease the probability of an employee in engaging in at-risk behaviour or accident occurrence (Blakely, 2009). Safety engineering involves mechanical revisions or modifications to eliminate existing, unsafe conditions and, in some cases, those that prevent unsafe acts. Design of machine guards, traffic signals, provision of sand bucket, fire extinguishers and bright lighting systems are varied examples of safety engineering at some fuel service stations. It is considered the most effective way of preventing accidents involving unsafe mechanical and physical conditions at workplaces (City of Miami, n.d.). Safety engineering aims at providing a safe environment and modifying work and work environment conducive to minimize accidents. Safety environment can be accomplished through the provision of appropriate safety facilities, modern equipment or tools for workers (Rajeev, 2010).

The second E in the concept addresses education and training needs of employees regarding appropriate equipment utilisation, awareness cautions about environmental hazards and adherence to policies and procedures (Gorman et al., 2013). The education or training aims at equipping workers with the effective use

of tools, equipment, facilities, work procedures, best practices, guidelines and regulations which are necessary for safe work. Education or training equips workers with appropriate knowledge, techniques and increases their confidence to work safely, thereby preventing and/or reducing accidents and ill health (Kendrick et al., 2009).

The third E emphasizes safety enforcement of the policies, regulations and programmes related to environmental safety, operating equipment, wearing proper PPE and handling specific hazardous substances (Blakely, 2009). Safety enforcement is critical in encouraging workers to abide by the policies, rules and regulations instituted at the workplace. Enforcing workplace safety and health policies and regulatory procedures may include supervising workers while they work, punishing defaulters of rules and regulations and rewarding them for good and consistent safety behaviours (Rajeev, 2010). Efficient enforcement demands a good supervisor's and co-worker support (Bond et al., 2010).

It is theoretically prudent to assume that providing "all" engineering measures, educating or training workers about risks, hazards and precautionary measures and enforcing policies, rules and regulations will prevent accidents and safeguard the health and safety of workers. The occurenece of accidents and injuries at the workplace go beyond appropriate engineering activities, education and enforcement of policies, rules and regulations. Workers, are now faced with conflict between work and family (O'Neill et al., 2009), different psychosocial work environment (Tuckey, Dollard, Hosking, & Winefield, 2009), safety culture and climate (Wills et al., 2009; Zohar, & Luria, 2003) complex work arrangement and sophisticated technological environment (Chang, McDonald, & Burton, 2009). Thus, if these factors and more are believed to influence accidents and

injury occurrence, workplace safety behaviours and the total health of workers, then it is important for the search for a more encompassing theory to help researchers investigate workplace health and safety issues.

**Protection motivation theory.** Rogers' protective motivation theory (PMT) applies the philosophy of fear appeal approach to causing a behavioural change in individuals (Rogers, 1985; 1975). The theory explains how individuals' health attitudes and behaviours change in response to health risk messages or perceptions of susceptibility to ill health conditions. PMT is one of the influential theories of health behaviour that many researchers apply in current times (Cismaru, 2006). The PMT states that individuals' (workers') motivation or intention to protect themselves and others from injuries and ill health situations is enhanced by their perception of the severity of the risk, the personal vulnerability to the risk, self-efficacy and the response efficacy of the risk-reduction behaviour On the other hand, workers intention to protect themselves or others is weakened by the perceived costs of the risk-reducing behaviours and the perceived benefits of the alternative risk-enhancing behaviour (Bender, Ingrid, & Raish, 2006; Rogers, 1985; 1975).

PMT further postulates that people can be provoked to engage in desirable health behaviour or to avoid health risks. Further, the knowledge of workers about their susceptibility to occupational injuries/diseases and the perception of the severity to these adverse health conditions may provoke the attitude of conducting their businesses safely in safe environment. Therefore, in this case, FSSAs believe that they have the requisite knowledge, capability and resources (self-efficacy) to deal with the risk they faced daily at their stations and to facilitate remedial actions they take that will evidently reduce the risks (respond efficacy). In the

view of Bender et al. (2006), such a belief influences workers positively to take actions that will reduce the risks and diseases that workers perceive can affect their health negatively. However, efforts towards risks reduction becomes difficult if taking appropriate measures such as using adequate PPE and other fuel station safety appliances such as fire extinguisher and smoke detectors become costs to the attendants.

Mulilis and Lippa's (1990) intervention study to examine the effects of a negative, threat-inducing persuasive message on the change in earthquake preparedness over a 5-week period of time produced the test for PMT. The authors found among 111 California home owners that the manipulations produced a significant change in the earthquake preparedness behaviour of the participants. A similar study in Israel explored the components of PMT in the use of hearing protection device (HPD) among men manufacturing workers (Melamed, Rabinowitz, Feiner, Weisberg, & Ribak, 1996). Melamed and colleagues found that the use of hearing protective devices was primarily related to worker variables and not management pressure, coworker pressure or family support. Furthermore, the use of such devices was predicted by perceived self-efficacy for long-term HPD use and perceived susceptibility to hearing loss. These studies underscore both theoretical and practical applicability of the PMT components and their usefulness in changing worker behaviour to promoting health, safety and well-being. However, current workplace literature exposes more relevant factors associated with workplace health and safety behaviour. For instance, a meta-analytic review by DeJoy (1996) strongly relates workplace self-protective behaviour to value-expectancy, environmental and contextual factors. DeJoy further recommended environmental or situational factors in enabling and

reinforcing self-protective behaviour in the workplace. Though evidenced and emphasized, PMT does not consider environmental, psychosocial and climate factors in determining workplace health and safety behaviour. Therefore, there is the need for a theory which assesses up-to-date variables in the studies relating to workplace health and safety.

**Job demands-resources theory.** Job demands–resources (JD-R) theory represents an extension of the job demands–resources model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). The model was inspired by job design and job stress theories (Parker, Wall, & Cordery, 2001). The JD-R theory was in response to the fact that job design theories have often failed to recognise and incorporate the role of job demands, and that job stress models largely ignored the motivating potential of job resources. Thus, JD-R theory explains how job demands and resources have unique and multiplicative effects on job stress and work motivation. In addition, it proposes reversed causal effects. In these effects, burned-out workers may create more job demands for themselves while engaged workers may mobilize and activate their own job resources to stay engaged (Bakker, & Demerouti, 2014).

The JD-R theory has two path ways or processes: a health impairment process and a motivational process (Bakker, & Demerouti, 2007). It states that job demands are initiators of a health impairment process and job resources are initiators of a motivational process. The theory further states that all working settings have two distinct job characteristics: job demands and job resources. The theory explains and makes predictions about employee well-being such as burnout, health, motivation, work engagement and job performance (Demerouti, & Bakker, 2011). Therefore, this theory can be applied to all work organisations

and can be used to study specific occupational group (Bakker, & Demerouti, 2014; Bakker, Demerouti, & Sanz-Vergel, 2014).

Job demands refer to physical, psychological, social, or organisational aspects of the job that require sustained physical and/or psychological efforts. They are connected with certain physiological and/or psychological costs (Demerouti et al., 2001). Job demands may include high work pressure and emotionally demanding interactions with customers as in the case of fuel station attendants (Monney et al., 2015). Job demands are not negative in themselves. They may pose challenges when in the act of satisfying such demands, the worker is not able to fully recover (Bakker, Van Veldhoven, & Xanthopoulou, 2010). Job resources refer to those physical, psychological, social, or organizational aspects of the job that are functional in achieving work goals. They may reduce job demands and the associated physiological and psychological costs. Besides, they stimulate personal growth, learning, and development (Bakker & Demerouti, 2007). Therefore, the import of job resources extends beyond reducing the effects of job demands on both physiological and psychological variables of the worker and includes creating a conducive work environment for all the stakeholders in the world of work (Bakker, & Demerouti, 2014; van Wingerden, Bakker, & Derks, 2016).

Many researchers over the years have explored this theory in different fields and among diverse population. These studies have demonstrated the job demands-resources interaction in promoting work outcomes such as job engagement and worker health variables. For example, Schaufeli and Bakker (2004) demonstrated that constructive feedback, social support, and coaching from supervisors were positively associated with three dimensions of job

engagement including vigor, dedication, and absorption. In a similar vein, Bakker, Hakanen, Demerouti and Xanthopoulou (2007) observed supervisor support, appreciation, information, job control, innovation, and climate to have positive influences on job engagement. Furthermore, a recent articles by Van den Broeck et al. (2017) demonstrated that JD-J model or theory is helpful in understading the relationship among job demands, job resources, burnout, work engagement of workers in healthcare, industry, service and public sector. Using similar analytical Buitendach, Bobat, Muzvidziwa and Kanengoni (2016) found among large sample of Zimbabwean bus drivers that job demands and resources had impacted employee's work engagement, job satisfaction, work happiness and burnout.

The tempering effect of job resources on the negative association between job demands and burnout have also been evidenced. Bakker, Demerouti, & Euwema (2005) showed that job demands, such as work overload, emotional demands, and conflict between work and home responsibilities, usually culminate in exhaustion and cynicism. However, such effects got reduced when job resources, like autonomy, feedback, and support, were available. Besides, job resources at one time predict subsequent improvements in job engagement. In this case, job resources become a link to improving worker morale and work performance. This was demonstrated by Mauno, Kinnunen and Ruokolainen, (2007) who found that resources such as current levels of job control predicted future job engagement. However, de Lange, De Witte and Notelaer (2008) argued that a cycle sometimes occurs whereby job resources promote job engagement that further attracts resources.

Similar evidence has been recorded by Bakker et al. (2007). They found among large sample of Finnish elementary, secondary, and vocational schools teachers that job resources act as buffers and diminish the negative relationship between pupil misbehaviour and work engagement. In addition, they observed that job resources influence work engagement when teachers are confronted with high levels of pupil misconduct, job demands. In specifics, supervisor support, innovativeness, appreciation, and organisational climate were important job resources for teachers that helped them cope with demanding interactions with students. Furthermore, Bakker et al. (2010) demonstrated with large sample (12,000) employees from different working groups that task enjoyment and organisational commitment were the results of different job demands and job resources. For instance, task enjoyment and commitment were highest when employees were faced with challenging and stimulating tasks, and had sufficient resources at their disposal.

Recently, van Wingerden et al.'s (2016) quasi-experimental study, using pre-test-post-test design with a control group also revealed that participants' psychological capital, job crafting, work engagement, and self-ratings of job performance significantly increased after the JD-R intervention. The aim of van Wingerden et al.'s study was to examine the impact of a JD-R intervention on psychological capital, job crafting, work engagement, and job performance among healthcare professionals. They found that organisations can foster work engagement and improve performance by contribution to JD-R interventions aimed at increasing the overall worker well-being and that it is critical to acknowledge the importance of facilitating and stimulating a resourceful and challenging work environment.

Although, there is an overwhelming and significant evidence of the positive impacts of JD-R interventions on providing conducive workplace environment and worker well-being (Bakker et al., 2014; 2010; de Lange et al., 2008; van Wingerden et al. 2016), they theory failed to consider the major roles of the senior management team in the promotion of the employee health (Dollard et al., 2012bd). This still places emphasis on the worker as the most important architect in creating satisfying workplace. However, the role of the senior management is much more essential since they can control and enforce workplace policies, procedures and practices within the workplace (Zinsser, & Zinsser, 2016). This may demonstrate the optimum concerns the organisation has towards its workforce (Dollard et al., 2014).

**Theoretical Model of PSC**

PSC evolved as a result of a predominantly focus on individual factors for the provision of intervention against work stress and health. Further, understanding of the work stress process is guided by major theories that emphasise job design components that combat health consequences (Dollard, & Bakker, 2010; Dollard et al., 2012ab). Moreover, studies inspired by these theories have been monolevel, focusing on individual perceptions of job design. For that, many researchers have called for multilevel theoretical models and research to explain the work stress process (Bliese, Jex, & Halverson, 2002) and move beyond individual phenomenon as explanations for work stress and health implications (Dollard, & McTernan, 2011).

Beyond the individual factors (for work stress and health intervention) was the search for conditions that give rise to prevailing work conditions that activate stress and pose health and safety conditions within organisations. This

search culminated to the proposition of a healthy, conducive production model whereby health, safety and well-being of workers are considered as important as production goals. The proposition argued that if management is concerned about the balance of production goals and the health of workers, it is then expected that work conditions will also be balanced (Garrick et al., 2014; Law et al., 2011). In such case, job demands will be manageable because job resources will adequately be supplied. In the same vein, organisational systems, policies, practices and procedures will reflect the production-health balance. These philosophy, values and actions of management give rise to PSC of an organisation (Dollard, & Bakker, 2010; Dollard, & Karasek, 2010).

PSC refers to a climate for employee psychological health and safety, and encompasses four inter-related principles: (a) the level of senior management commitment and support for stress prevention; (b) the priority management gives to health and safety versus productivity goals; (c) organisational communication, upwards and downwards in relation to health and safety; and (d) the extent of participation and involvement by managers and workers in relation to health and safety (Dollard et al., 2011; Hall et al., 2010). PSC is defined as "shared perceptions of organisational policies, practices and procedures for the protection of worker psychological health and safety", (p. 1) that stems largely from management safety practices (Law et al., 2011). Thus, PSC score reflects the adequacy of an organisation's practices and procedures that are proven to support health and safety of its employees (Bailey, Dollard, & Richards, 2015a). Accordingly, Bailey and others' recent organisational study revealed that as workplace health and safety scores reduce, employees face greater risks of depression and job stress. Moreover, reduced workplace safety score is a

demonstration of high job demands, less job control, increased injury and illness rates (Winwood et al., 2013).

Previous research established evidence for the relationship between leadership for positive emotional climate and organisational performance such as revenue growth (Ozcelik, Langton, & Aldrich, 2008). Perhaps, this occurs through the path of job resources and engagement. Accordingly, PSC is an indicator of job resources and, in turn, engagement and positive work outcomes such as job satisfaction (Dollard, & McTernan, 2011). A meta-analysis shows that the health erosion and motivational pathways are mechanisms by which demands and resources relate to health and safety outcomes (Nahrgang, Morgeson, & Hofmann, 2010). The extended health erosion path way is the one from PSC through job demands to health outcomes such as physical health and safety, psychological distress, and emotional exhaustion. Extended motional path has PSC through job resources and work outcomes like engagement, presenteeism and absenteeism (Dollard et al., 2012a). The two paths may lead to the promotion of the health and safety of the workers. Previous research also linked work stress (negative PSC and job demands) and medical errors (Jones et al., 1988). Therefore, PSC is expected to precipitate these paths and serves as a lead indicator of safety outcomes, errors, accidents, injuries and death (Dollard et al., 2011; Garrick et al., 2014).

Evidence is further mounting about the importance of the PSC context in organisations. In relation to its possible preventative function, Dollard and Bakker (2010) found that high PSC was longitudinally related to lower emotional demands, work pressure and increased skill discretion. These are signals of job control (Nordenmark, Vinberg, & Strandh, 2012). In turn, these demands and

resources carry the effect of unit level PSC onto perceived health and safety status of workers. These findings provide strong evidence for how PSC is linked to health outcomes through workplace policies, practices and procedures that are implemented in relation to job design. Moreover, the moderation function of PSC also provides that it acts like a higher level support variable by providing the imprimatur for instrumental support (peer support) or by providing a context where workers feel comfortable utilising available resources to cope with work demands. Several studies have shown that the detrimental effect of demands on health and safety is moderated in the context of high PSC (Law et al., 2011). Further, PSC at high levels moderates the effect of bullying and harassment on posttraumatic worksite stress disorders (Bond et al., 2010).

In relation to PSC's latency for workplace safety or hazardous behaviour, Law et al. (2011) found evidence that PSC acts as a latent pathogen for hazardous behaviour such as bullying and harassment. Accordingly, workers who face such health challenging situations at their workplaces also report much more chronic health conditions (Hines, Barrett, Jiang, & Steiner, 2014). This health status is likely to increase the health seeking behaviour of these workers as they attempt to seek treatment from health facilities. Organisations with high PSC are expected to have policies, practices and procedures regarding appropriate workplace behaviour that are strongly and consistently enacted. In the absence of policies and actions, bullying and harassment are tacitly condoned. Further, employees have to know the right norms and practices regarding occupational safety, if life is to be protected. Thus, PSC serves both a preventative and an ameliorative function in the development of work stress and becomes an optimal target for

primary and secondary intervention (Dollard, & Bakker, 2010; Dollard, & McTernan, 2011).

PSC of an organisation is recognised as a powerful factor influencing workers' psychological and physical health, safety and well-being (Dollard et al., 2012a). PSC theory is an extension of the JD-R framework (Bakker, Demerouti, 2007). PSC proposes that organisational level PSC determines work conditions and subsequently it determines psychological health problems, safety and work engagement otherwise known as work outcomes of workers (Dollard, & Bakker, 2010; Dollard et al., 2012abc). And that organisational PSC, with emphasis on safety, such as management support and priority for, management participation and communication of health and safety influences job resources and job demands. These interactions in turn affect work outcomes and worker health and safety (European Agency for Safety and Health at Work, 2010).

According to Dollard and Bakker (2010), and Dollard et al. (2012abc), PSC precedes and influences supervisor and co-worker's support (job resources), emotional demands, physical demands and bullying and harassment (job demands). Dollard and Bakker further observed that PSC moderates directly and indirectly, via job resources and job demands models, job satisfaction, absenteeism and presenteeism (work outcomes), psychological distress, emotional exhaustion and physical health of the worker (Lindeberg et al., 2010; Seidler et al., 2014). The theorists of PSC are of the opinion that work conditions, worker health and engagement can be predicted when the PSC of an organisation or work group is known (Dollard et al., 2012a). As a 21st century theory, PSC attempts to explore the total organisational management factors influencing work processes (job resources and job demands) which in turn influence work

outcomes variables and the total health of the worker (Waldenström, Lundberg, Waldenström, Härenstam, & MOA Research Group, 2003). Therefore, this study relied on the theory of PSC as its theoretical framework.

According to Dollard et al. (2012a), in high PSC contexts, managers will be cognisant of risk factors and will help to shape jobs where demands are manageable and resources are adequately provided. Therefore, if PSC is assessed, levels of demands and resources can be predicted. In addition, work outcomes and worker health and safety can be predicted. In a typical health and safety oriented organisation, PSC will involve senior management support for, priority of, and organisational participation and communication of health, safety and well-being of and with the workforce (Dollard, & Bakker, 2010; Dollard et al., 2012c). In the fuel service station industry, PSC will be reflected in the management safety practices. Management safety practices may include safety education or training prior to or on the job, provision of PPE and safety facilities and formulation and effective of safety policies (Ansah, & Mintah, 2012; Arcury et al., 2013). Becher et al. (2016) further suggested that the differences between a company and another in relation to the health and safety of their workers and their perceptions about workplace PSC depend largely on how senior management demonstrate their commitment towards safety climate. In this instance, when senior management shows commitment and participates actively in safety matters, there is more likely to be less injury, stress, bullying and harassment (Dollard et al., 2014; 2012d). In such workplaces, PSC is perceived high and positive (Idris, Dollard, Coward, & Dormann, 2012; Hall et al., 2013).

Management safety practices involve strong and active leadership from the top management level (Barling, & Frone, 2016). In explaining the negative

relationship of passive leadership to employee well-being, Barling and Frone contended that passive leadership is directly related to a poor work environment. It is also directly and/or indirectly related to employee higher levels of psychological work fatigue and poorer mental health and overall work attitude. Barling and Frone explained that passive leaders fail to provide direction and support, and to ensure that appropriate reward including punishment, structures are in place that help to provide clarity about performance standards and expectations. Accordingly, such leaders create a work environment that can compromise employees' ability to meet performance expectations, and may undermine their well-being. Such a leadership manifests in management support, and active participation and establishing effective 'downward' communication systems and management structures for health, safety and well-being of the attendants (Ansah, & Mintah, 2012; Lehmann et al., 2009). Thus, a high or positive organisational PSC is expected to precede such organisational health and safety oriented activities that foster worker health promotion (Dollard et al., 2012ac). This indicates that where senior managers of the OMCs are committed to and prioritize health and safety of their attendants, the management is most likely to provide resources that will protect and improve health and safety. A condition of such sought is mostly evidenced in high job satisfaction and productivity, less reported job demands, absenteeism and presenteeism, injury rates and physical health complaints such as headaches and musculoskeletal disorders (Demerouti, Le Blanc, Bakker, Schaufeli, & Hox, 2009; Gilbreath, & Karimi, 2012).

PSC as a climate is an antecedent to organisational job resources such as supervisor and co-worker support (Dollard et al., 2012a). However, at low

organisational PSC, workers are said to experience high job demands, emotional demands, physical demands, and bullying and harassment (Dollard, & Bakker, 2010). In addition, the theory of PSC reveals a reciprocal relationship between job resources and job demands. For instance, a worker with a perceived high positive supervisor and co-workers support is likely to experience low job emotional and physical demands. Such a worker is also likely to experience less organisational bullying and harassment (Bond et al., 2010). On the contrary, if fuel attendants should perceive low supervisor and co-worker support at their service stations, they are most likely to feel the high emotional and physical demands placed on them, either by management or simply by work organisation (Azma, Omar, Muda, & Endut, 2013). It is also possible that attendants who experience no or minimal support from their supervisors and co-workers will experience high level of workplace bullying and harassment (Okoye, & Aderibigbe, 2014). As found among Vietnam's public workers (Nguyen, Teo, Grover, & Nguyen, 2017) workplace bullying is reduced when there is reported positive PSC. Thus, organisational PSC adverts risks and hazards and provides for a congenial working environment for every worker (Zinsser, & Zinsser, 2016).

Supervisor and co-worker support may be manifesting in the number and quality of available materials needed to work with and the assistance each worker receives from each other including prompting on issues of health and safety (Lanciano, & Zammuner, 2014). Moreover, supervisors assist their workers to better appreciate and understand work procedures, rules and regulations. These roles of the supervisors result in establishing a stronger relationship between the supervisors and attendants and their influence on attendants' organisational safety climate perceptions (Kumako, & Asumeng, 2013). Such supervisors are the

liaison officers between management and the workers, promoting the welfare of the workers (Dollard, Tuckey, Bailey, & McLinton, 2012d). Furthermore, psychological distress, emotional and physical job demands are normally under control in a congenial workplace where line workers assist one another (Oxenstierna, Widmark, Finnholm, & Elofsson, 2008). Besides, job design variables including highly demanding work environments where either job control or job support is low, bullying and harassment can be high (Tuckey et al., 2009).

Walker's (2007) study with participants from a South African construction industry indicated that conducive organisational safety climate can be created by line project managers, who are the immediate leaders. Accordingly, these line managers create work environments by which workers may perceive the management team as prioritizing their well-being over other issues or otherwise. In such a workplace, safety climate perception would be high (Dollard et al., 2012b), thereby reducing the weight of daily job demands (Nguyen et al., 2017). A similar study by Kouabenan, Ngueutsa and Mbaye (2015) revealed the supervisors' role in affecting safety climate perception. Their results among first-line managers showed that supervisors' encouragement was more influential on safety climate perception than that of senior management views.

According to Dollard et al. (2012a), PSC is related to work outcomes (job satisfaction, absenteeism and presenteeism) and worker health outcomes (psychological distress, emotional exhaustion and physical health) through the mediating paths of job resources and demands.

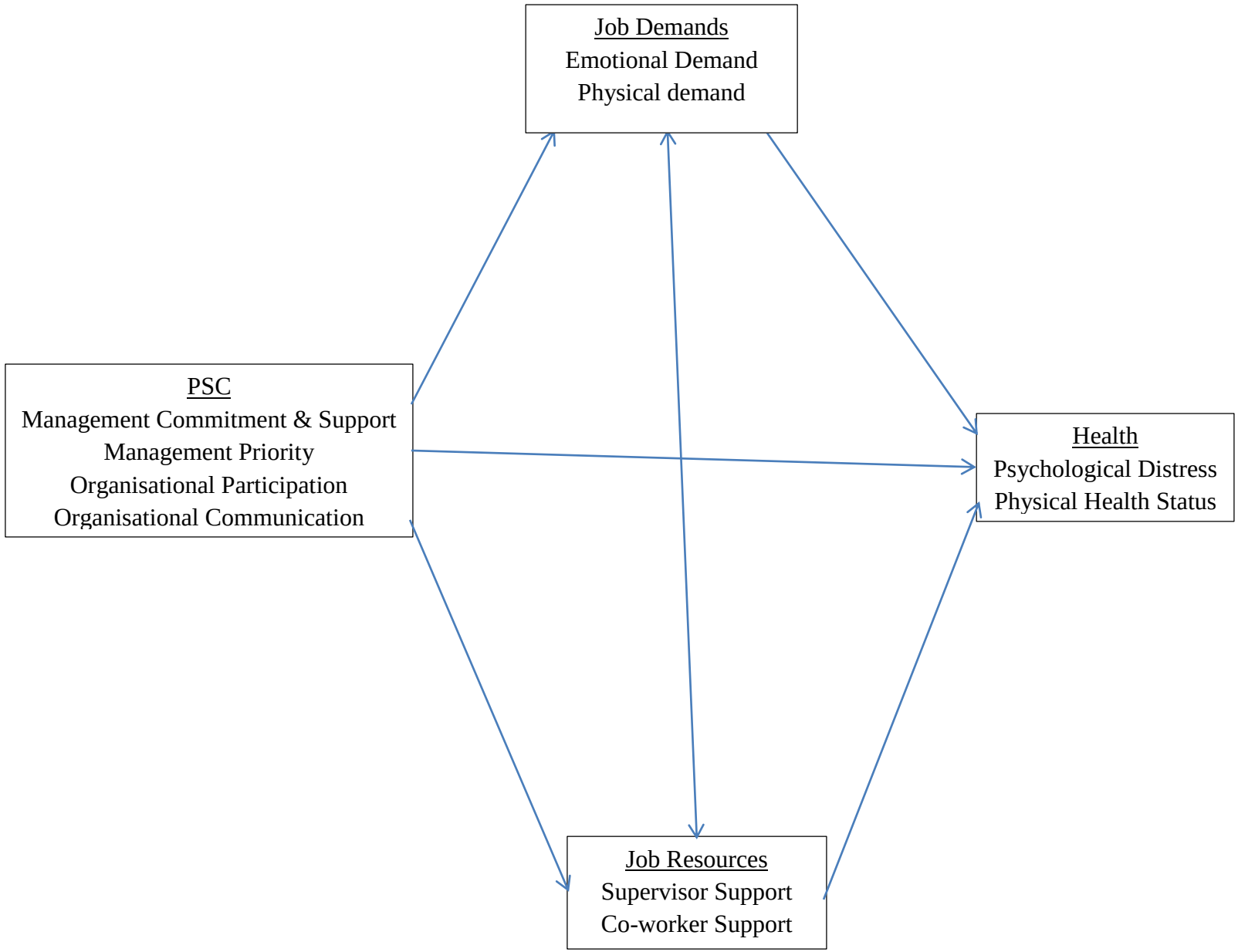


**Figure 1: Theoretical Model of PSC (Dollard et al., 2012a)**

Job resources directly promote job satisfaction, reduce absenteeism and presenteeism and decrease psychological distress, emotional exhaustion and physical health effects of the worker (Seidler et al., 2014). Additionally, job demands inversely relate directly with work outcomes and worker health. Therefore, attendant experiencing high job demands are probably battling with job dissatisfaction, absenteeism and presenteeism, psychological distress, emotional exhaustion and impaired physical health status (Gyekye, & Salminen, 2007). Besides, PSC provides interactive or reciprocal relationship between work outcome constructs and worker health variables (Dollard, & Bakker, 2010; Dollard et al., 2012ac). Accordingly, fuel attendants with high job satisfaction, low absenteeism and presenteeism are more likely to have less job psychological distress, emotional exhaustion and better physical health status (Lindeberg et al., 2010). Thus, the relationship between PSC and its constituent constructs is graphically represented below.

**Interactions among PSC, Job Demands and Job Recourses**

Organisational PSC is a management-driven concept that arises from workplace policies, practices and procedures for the protection of worker psychological health and safety (Dollard, Tuckey, & Dormann, 2012e; Idris et al., 2012). For instance, in a typical JD-R model, a high level of job demands leads to psychological distress. However, this relationship will be offset when there are high job resources (Bakker, & Demerouti, 2007), which are influenced largely by the organisational context produced through senior managers' safety concerns (Dollard et al., 2012d). Thus, high levels of PSC enable the safe utilisation of job resources to reduce demands. Dollard et al. identified from their longitudinal study conducted with a large sample of Australian police officers

that right organisational climate is necessary for resources to offset the influence of job demands. With hierarchical linear modeling, these authors observed that in the presence of high levels of PSC, high emotional resources moderated the positive relationship between emotional demands and change in workgroup distress. Thus, PSC becomes a preeminent stress risk factor, mediating the interactions among job demands, resources and psychological health problems among workers (Idris et al., 2012).

Using a randomly selected 291 Malaysian employees, Idris et al. (2011) proposed that work performance could be affected via both the extended health erosion pathway and the extended motivational pathway. Idris et al.'s cross-sectional survey analysed data using structural equation modeling and bootstrapping algorism in AMOS (Analysis of Moment Structures), a statistical technique used to test the amount of influence one variable has on another through any number of mediating variables. The data were analysed at the individual level since the identity of the organisations was not known, in contrast to aggregation of the data for PSC (Dollard, & Bakker, 2010; Law et al., 2011). In support of their hypothesis, Idris et al. observed that PSC was negatively related to job demands that in turn were associated with burnout or exhaustion and cynicism- a sign of psychological distress (Lanciano, & Zammuner, 2014). PSC was also related to job performance but only through its direct relationship to burnout. Again, PSC was related to performance through its positive relationship with job resources and in turn job satisfaction. In another study that used 269 employees from both public and private sectors in Malaysia, Idris and Dollard (2011) found that PSC had indirect effect on depression through job demands (emotional demands). Aggregating the data for PSC and structural equation modeling for

analysis, they supported their hypothesis that job resources, either supervisor support, co-worker support, related to job satisfaction through PSC.

Though, it is both a moral and legal requirement for the employers to provide safe working environment (Clarke, 2008) and this demonstrates in organisational PSC (Dollard, & Bakker, 2010; Dollard et al., 2012bc). It is equally the responsibility of the workers to adhere to the policies, procedures and follow practices that promote their health and safety (Clarke, 2010; Dollard et al., 2014). To that effect, the increasing and preservation of workplace positive PSC does not only rests on the shoulders of the employers but workers as well (Zinsser, & Zinsser, 2016). Two case studies by Zinsser and Zinsser, exploring the PSC at preschool, observed that the school policies and laid down procedures and other related practices could never be realized without the conscious efforts from the teachers. Accordingly, the school safety climate could not have been raised and maintained high without active and conscious participation of the teachers.

**Factors Affecting PSC and Worker Health and Safety**

PSC of organisations is a shared perception of workers and is believed to be antecedent "cause of cause" to worker safety and well-being (Dollard et al., 2012b). Organisational PSC is reflected in the management support, priority, participation and communication of safety issues to the workforce (Cigularov, Chen, & Rosecrance, 2010). In addition, PSC is antecedent to job resources (supervisor and co-worker support) and job demands such as emotional demand, physical demand, and bullying and harassment (Winwood, Stevens, & Bowden, 2015) which inadvertently moderate work outcomes (job satisfaction, absenteeism and presenteeism) and health (psychological distress, emotional exhaustion and physical health status) of the worker (Dallard et al., 2012ac;

Dollard, & McTernan, 2011). Additionally, safety climate is influenced by company size (Songstad et al., 2012), employee work experience (Oltedal, & McArthur, 2011), age, gender, (Mahalik, Burns, & Syzdek, 2009) educational level and whether such workers ever experience injury or not (Ansah, & Mintah, 2012; Okoye, & Aderibigbe, 2014).

**Relationship between PSC and worker health and safety.** PSC involves management support and priority and organisational participation and communication of employees' health and safety (Dallard et al., 2012ac; Dollard, & McTernan, 2011). Managers can have a positive influence on the safety outcomes, by articulating a clear vision for health and safety of their workers. Moreover, motivating employees to achieve health and safety, acting as role models and showing concern for the welfare of employees, communicating and setting clear goals and standards for safety, monitoring and recognizing positive safety behaviours are some manifestations of positive workplace safety climate. Effective managers are coaching-oriented and supportive. It further provides the necessary resources and encourages workers involvement in safety issues (Dollard, & Bakker, 2010).

The import of safety climate perceptions is key to health and safety of all workers (Dollard et al., 2012c). High perceived safety manifests in safety behaviours of workers, less absenteeism and presenteeism, increase productivity and general economic gains for the organization (Occupational Safety and Health Administration, 2010). Colley et al., (2013) found among the Australian high risk industry workers that those who had perceived that their organisation strongly emphasized formal processes and procedures in addition to goal attainment reported lower levels of safety climate and more safety incidents. But these

authors further found with one-way MANOVA that workers who perceived that their organisations strongly emphasize employee well-being or employee well-being and goal attainment and human reported higher levels of safety climate and fewer safety incidents. This study involved a sample of 368 that surveyed predominantly males (82%). Besides, the sample mean age was 37.9, representing those who worked in mining, power/electrical, engineering/ construction, rail, and aluminum smelting sectors. This survey aim at understanding how different patterns of perceived organisational values are related to safety. Therefore, positive organisational safety climate becomes more a corporate business issue rather than just employee protection mandate (Stańczak, Mościcka-Teske, & Merecz-Kot, 2014).

Management commitment to safety, active involvement and participation in safety and consistent enforcement of safety policies are associated with positive safety outcomes such as positive perceptions of safety climate and reduced levels of risk taking behaviours (Gilbreath, & Karimi, 2012). Moreover, management commitment to safety is associated with reduction in violations of safety regulations, lower levels of self-report incidents and higher levels of learning from safety events (Bergh et al., 2013; Okoye, & Aderibigbe, 2014). Moreover, leader support for safety and openness to safety suggestions is also associated with higher levels of employee willingness to raise safety issues, lower levels of report injury rates, higher levels of satisfaction with the organisation and can lead to a long-term improvement in safe working practices (Dollard, & Bakker, 2010). Additionally, management commitment affects workers' safety perceptions and behaviours. Besides, workers' perceptions and behaviours

determine the extent to which they compromise health and safety or safeguard lives and property (Dallard et al., 2012ac).

Safety communication and worker involvement in improving work environment have a positive impact on safety. Good working relationships between management (typically supervisors and employees) and perceptions that management values safety influence the 'bottom-up' communication of safety concerns (Dollard, & Bakker, 2010; Idris et al., 2011) have also been examined. Trust in management is an important determinant of safety as it enhances perceptions of a positive safety climate and employees' motivation to work safely, and reduces accident involvement and injuries. Perceptions that management values safety and encourage of two-way safety communications promote trust. Thus, consistent safety messages need to be demonstrated at all management levels, from senior management to supervisors and down to the individual workers. A bottom-up communication provides the worker opportunities to raise first hand safety concerns. Probably, the workers may take actions and/or provide meaningful suggestions for eliminating such hazards (Lehmann et al., 2009).

Organisational safety communication that is open leads workers to demanding workplace safety policy, safety training, setting safety goals, encourages immediate accident reports, helps others to conduct safety inspections, and prioritize safety matters at meetings (Shen, Koh, Rowlinson, & Bridge, 2015). However, lower level workers feel alienated when safety communication becomes top-down. In such a work environment, workers feel discriminated. According to Lee et al. (2016), workplace discrimination contributes significantly and positively to depression that affects concentration

difficulties, indecisiveness, and forgetfulness (Wang, & Gorenstein, 2014). A recent meta-analysis also found a strong association between mental health conditions, such as depression or anxiety and perceived discrimination among a cohort of Korean workers (Son, & Kim, 2015). Therefore, good safety communication aims not only to promote and protect the workers but to also give them capacity and voice to contribute effectively to their safety promotion.

Managerial training interventions can have a positive influence on occupational safety and may be an effective means of enabling managers to develop leadership skills that are conducive to safety. Evidence again indicates that safety communication between management and the workforce is associated with a reduction in the levels of risk-taking behaviours, promotion of positive safety behaviours and reduced levels of self-report work-related pain (Dollard, & Bakker, 2010). Failure to demonstrate commitment to safety, including investing the necessary resources for the maintenance of equipment and prioritising safety over production was evident in major incidents. For instance, the Columbia space shuttle incident where pressures to go ahead with the launch resulted in compromises in safety. The physical cause of the incident involved a failure in the shuttle's thermal protection system, which resulted in its disintegration upon reentering into the earth's atmosphere (Kadri, & Jones, 2006). Among the contributory factors highlighted in the Columbia Accident Investigation Board Report was the fact that they were under immense resource constraints coupled with pressures to complete the launch. These factors had contributed to an environment where employees felt that they could not raise any safety concerns that could compromise the launch. Although under pressures, evidence indicated that the workers made numerous efforts to communicate their concerns to

management but their safety concerns were either ignored or downplayed by the mission managers (Gilbreath, & Karimi, 2012; Kadri, & Jones, 2006). Nonetheless, workers in various organisations and capacities are mindful of their safety but when job pressure from management suggests that productivity is first to safety, workers are most likely to compromise their safety for organisational gains (Stańczak et al., 2014). The improvement in organisational safety climate reduces burnout and exhaustion, improves work engagement among workers and increases productivity (Geldenhuys, Łaba, & Venter, 2014).

Harvard Business Review's (2013) statement indicates that employee engagement is a top priority business case in recent times. In addition, a highly engaged worker or the one who reported high job satisfaction is more productive, absents him or herslf less times from work. Organisations also spend less in cost on the healthcare of such workers (Smit et al., 2016). The conclusions are thorough and based on analytical review with the majority of the researches coming from Harvard Business School. Nevertheless, the reviewed studies surveyed both top company executives and employees. These studies were conducted in only formal sectors and developed countries. These large multinational companies are probably motivated by their national OHS policies to care properly for the health and well-being of their workers. Moreover, for promoting their corporate image, preventing employee health and safety costs including compensation claims, some organisations take actions to safeguard worker health, safety and well-being (McTernan et al., 2013).

Law et al. (2011) also observed with hierarchical linear modeling that organisational PSC was negatively associated with workplace bullying and harassment and in turn psychological health problems among the workers. The

authors aimed at determining the relationships among PSC, bullying and harassment, job resources, psychological health and employee engagement. Their results indicated that PSC moderated the positive relationship between bullying and harassment and psychological health problems. Again, PSC moderated the negative relationship between bullying and harassment and job satisfaction. The indication is that workers with relatively high experience of bullying and harassment are less satisfied with their jobs. Thus, job satisfaction becomes a buffer to worker health (Gilbreath, & Karimi, 2012; Nahrgang et al., 2011). Additionally, Law et al. (2011) revealed that PSC was positively associated with work resources and in turn job satisfaction. This also provides evidence to the effect that in organisations where workers enjoy support from their supervisors and colleagues, they equally feel satisfied with their jobs (Seidler et al., 2014). The evidence adduced by Law et al. (2011) presupposes that PSC is an organisational resource that promotes worker health and safety. Also, PSC precedes organisational job resources and job satisfaction that promote worker health and well-being (Dorllad, & Bakker, 2010; Dorllad et al., 2012ab). Besides, workers with high perceptions on safety express the highest level of job satisfaction and record the lowest accident frequency (Wachter, & Yorio, 2014).

Several research analyses showed that PSC is both a direct and an indirect determinant of health and safety of workers (Garrick et al., 2014; Hall et al., 2013). Among a large sample of Australian basic school teachers, Garrick et al. (2014) observed the main effect of PSC on both chronic fatigue and work engagement. They noted that teachers at schools with lower PSC also reported higher fatigue level and engagement even after controlling for job demands. Thus, PSC was negatively related to fatigue levels and positively to work engagement

(Dollard, & Bakker, 2010). A similar finding by Hall et al. (2013) reiterated the direct effect of PSC on the safety signal for workers such as reduction depression. As the organisation records improved PSC, the workers' rate of depression also reduces. However, depression as a serious workplace health consequence (Kessler, Merikangas, & Wang, 2008) increases as the workers report lower PSC.

Fatigue, especially in its chronic state, is a health condition that can further lead to other illnesses such as depression, stress, headache, back pain, high BP and cardio-respiratory effects (American College of Occupational and Environmental Medicine et al., 2012). It is a feeling of fatigue a worker experiences following exposure to job demands during a work shift. In most cases, fatigue can be characterized by states of physical exhaustion and temporary impoverishment in cognitive function, mood, and motivation. Then, there is a need for a recovery from shift that may be undermined by a low level PSC work environment (Dollard et al., 2012e). Work engagement on other hand manifests in the vigour, dedication and enthusiasm the worker possesses and with which he or she works (Dollard, & McTernan, 2011). Senior management of organisations would need to pay a particular attention to developing a vibrant PSC to prevent workplace psychosocial hazards. Managers need to build environments conducive to worker psychological and physical health and safety (Garrick et al., 2014).

**Relationship between Safety measures and worker health and safety.** Every employer is legally and morally required to institute measures (safety measures) that provide conducive, safe and healthy working environments for their employees (Lerssi-Uskelin, Hopsu, & Salmi, 2014). The provision of conducive working environment promotes health and well-being and worker

morale, reduces injury rate, illnesses, and increases productivity. Besides, an organisation with high attention worker health and safety reduces or eliminates compensation claims among others, while promoting economic growth to the workers, and the organisation (Clarke, 2008; Health and Safety Executive, 2008).

There are lots of practical safety measure activities employers can integrate into their workplaces for the health and safety of their employees. These measures range from instituting OHS policies, establishing workplace safety committees to supervise and enforce compliance of the policies to providing safety training and education, safety facilities, PPE, and pre-and-on-the-job medical screening and services. The effects of these safety measures are interdependent. For instance, instituting worksite safety policy (Dwomoh, Owusu, & Addo, 2013) or providing PPE without enforcing the policy to increase compliance or supervising workers to wear the protective devices, will have no or very little effect (Clarke, 2008).

***Safety training/education.*** Safety training or educating workers on the safe work procedures is one of the critical means of protecting and promoting their health and safety (Ansah, & Mintah, 2012). Strong health and safety training programmes reduce worker turnovers and increase compliance with health and safety requirements (Wilkins, 2011). This assertion was found among large (1116) randomly selected registered nurses (Alison, Barbara, & Karen, 2003). Alison et al. observed that training in workstation adjustment was associated with significantly lower odds of MSD prevalence. According to Wilkins' argument, U.S. construction workers who received safety training reported less injuries compared with other without such education. Wilkins based the observation on the fact that those workers have better construction site safety behaviours compared to those with higher rates of injury. For example, Yang et al. (2016a) recently

cautioned that trainng would be a viable workplace intervention against neck pain. In their analysis of 2010 US National Health interview survey, they found neck pain to be signicantly associated with work-family imbalance, exposure to a hostile work environment and job insecurity, non-standard work arrangements, multiple jobs and long work hours. Safety training is believed could offset their effects on the well-being of the workers (Kim et al., 2013). On the other hand, Alison et al. found no effect of postural training on the pain at the neck, shoulder and back. Similarly, a review of randomized controlled trials and cohort studies revealed no effect of training in working techniques with or without lifting equipment on the preventing back pain or consequent disability (Martimo et al., 2007).

Workplace safety training is sparsely available to many workers, and it disadvantages younger workers, women and less experienced workers (Smith, & Mustard, 2007). Among a large cross-section of Canadian employees, Smith, and Mustard found no increased likelihood of safety training among younger workers or workers with higher physical demands jobs, though these two jobs are associated with increased injury risk (Dollard et al., 2014) and associated job losses (Okechukwu, Bacic, Velasquez, & Hammer, 2015). That is, Smith and Mustard attribute the increased injury rate among young workers to the lack access to safety training which they further believe affects the workers' safety behaviours (Okoye, & Aderibigbe, 2014). For example, a reciprocal relationship is found between injury to workers and their behaviours (Wall, Ogloff, & Morrissey, 2006) including taken safety precautions (Kanten, 2013). Wall et al. (2006) are of the view that injured workers tend to be more prone to making

mistakes which further causes additional vulnerability (WorkSafety Saskatchewan, 2015).

The relation between occupational and organisational factors and work related injuries was examined among Costa Rican public health workers by, Gimeno, Felknor, Burau and Delclos (2005). Accordingly, workers who are exposed to chemicals and physical hazards had higher work-related injuries rate ratios than non-exposed workers. Moreover, workers reporting a lack of safety training were more exposed to chemical and physical hazards than employees who received safety training (Waehrer, & Miller, 2009). They further observed that employees reporting lack of safety training had higher work-related injuries rate ratios than those who had some amount of safety training. Thus, safety training becomes a significant factors in determining work related injuries. For example, training workers in the appropriate use of PPE in advance of their need is strongly advised (Tsung-Chih et al., 2007). Training given on time is also likely to provide adequate preparation for workers requiring the use of such PPE (Tompkins, & Kerchberger, 2010). Among registered nurses, van der Molen, Zwinderman, Sluiter and Frings-Dresen (2011) found that attending a safety training workshop resulted to a significant reduction in the number of self-reported needle stick injuries among the health workers. Moreover, such trainings reduce the high level of traumatisation associated with nursing profession (Sinclair, & Hamill, 2007).

***Safety facilities/devices.*** Workplace safety facilities and devices include movable and stationary or permanent facilities whose presence or otherwise affects the health, safety and well-being of the workers (Clarke, 2008; Puplampu, & Quartey, 2012). Health and safety facilities and devices at a typical workplace

may include bathing and hand washing facilities with a regular running water, cloth storage facility, eating facility and firefighting devices (Rickie, & Sieber, 2010). The positive effect of providing safety devices was evidenced in van der Molen et al.'s (2011) study. They believe that provision of needed safety devices and positive interaction with and among health workers caused the reduction in the number of self-reported needle stick injuries. Alison et al. (2003) further argued in favour for the provision and use of such safety devices. They provided justification that the reduction of MSDs is likely even with a limited use of mechanical devices and lifting teams and with such health facilities, nurses are significantly less likely to have neck or back MSDs. But Martimo et al.'s (2007) review revealed otherwise. They found no evidence supporting the use of advice for the prevention of back pain among a cross-section of such workers.

**Relationship among job demands, job resources and worker health and safety.** The safety climate literature is explicit about the influence of job resources on the work outcomes, and health and well-being indicators of workers. Further evidence suggests that supervisor and co-worker support are typical job resource constructs that are associated with work outcomes variables such as job satisfaction, absenteeism and presenteeism, and worker health-psychological distress, emotional exhaustion and physical health status (Dallard et al., 2012c; Nahrgang et al., 2011). In a similar study, Schirmer and Lopez (2001) found supervisor support uniquely predicting all three strain constructs- burnout, emotional exhaustion and psychological distress. Moreover, the interaction of supervisor support and worker attachment orientation significantly predicted work stress intensity and job satisfaction (Brough, Dollard, & Tuckey, 2014). This study determined the contributions of supervisor support and adult

attachment orientation to work-related strain within 117 adult university employees. Adult attachment provides for either cordial relationships among workers (Wei, Shaffer, Young, & Zakalik, 2005), and thus, promotes co-worker support, work involvement, job satisfaction and the total well-being of the worker (Lanciano, & Zammuner, 2014). In recent study, for example, Van den Broeck et al. (2017) concluded that worker burnout needs to be decreased by increasing work engagement particularly in industry, service and the public sector. Using one-way analyses of variance and multi-group SEM analyses, Broeck et al. observed differences in the levels of job demands, job resources, burnout and work engagement. They further found that industry, service and the public sector wrokers significantly experienced higher degrees of job demands and buornout.

**Relationship between job demands and worker health and safety.** Almost a decade ago, organisational research has identified job demands variables such as work psychological demands, physical demands and bullying and harassment as antecedent influencing factors to work outcome variables and worker health status (Mauno et al., 2007). Dollard and Bakker (2010) and Dallard et al. (2012bc) in their various studies reported a direct negative association between perceived high job psychological demands, physical demands, and bullying and harassment and job satisfaction. They also observed a positive correlation between job demands, absenteeism and presenteeism. Meanwhile, these authors established that in organisations where employees' perceived job demands to be high, such employees are also more likely to report high stress, burnout with associated injury rates (Nahrgang et al., 2011). Burnout is an antecedent variable to many adverse health conditions including behaviour (Bakker, Le Blanc, & Schaufeli, 2005). It influences not only the physical and

psycho-emotional health of the worker, but also health behaviour of the worker (Alexandrova-Karamanova et al., 2016).

Alexandrova-Karamanova et al.'s (2016) recent multinational cross-sectional study of doctors, nurses and residents from Greece, Portugal, Bulgaria, Romania, Turkey, Croatia and Macedonia revealed significant positive relation of burnout to certain health behaviours. Alexandrova-Karamanova et al. aimed to exploring the associations between burnout and fast food consumption, alcohol consumption, exercise, and painkiller use among a large sample of 2623 healthcare professionals. These authors demonstrated that health workers with higher levels of burnout also reported higher amount of fast food and alcohol consumption, infrequent exercise, and more frequent painkiller use. Accordingly, even after controlling for some confounding variables, these effects still remained. Moreover, young workers experienced higher level of burnout and its effects of their health behaviour than older and more experienced once.

Job demands has a direct inverse relation with work outcomes and worker health (Masia, & Pienaar, 2011). A cross-sectional study by Masia, and Pienaar (2011) among mind workers in South Africa revealed that work stress and job insecurity had a negative relationship with safety. Accordingly, workers who reported high job stress also recorded significant corresponding high injury rates. In another observation, Santiago et al. (2014) attributed Osteoarticular diseases to the long period of standing and physical labor among a conveniently sample workers (158). A similar finding was revealed among randomly selected Australian casual workers that physical demands such as carrying loads and being on the feet for long hours were related to MSDs (Bailey et al., 2015b). Bailey et al. further revealed that such workers reported higher injuries, illnesses rates and

are very much dissatisfied with their jobs. These conditions translated into a relatively high workers' compensation claims. In addition, they found job satisfaction as a significant predictor of safety (Nel, Stander, & Latif, 2015). Furthermore, Burke, Moodie, Dolan and Fiksenbaum (2012) showed that job demands had generally significant and negative relationships with nurses' well-being. Moreover, increase in job resources has positive relation to employee well-being though increased engagement and job satisfaction, and decreased burnout (Tims, Bakker, & Derks, 2013).

The influence of job satisfaction on employees' life and safety cannot be underestimated. Stoilkovska, Pančovska and Mijoski (2015) demonstrated that job satisfaction has a strong effect on perceived management commitment to work safety, which is one component of PSC (Dollard et al., 2012ab; Dollard, & Bakker, 2010). These authors concluded, with data from construction workers, that in the presence of satisfaction, there would be lower percentage of accidents and injuries in the workplace and a better health among the employees. The mediating role of job satisfaction is further demonstrated by Avram et al. (2015). To test the mediating effects of job satisfaction on the relation between safety climate and organisational trust, Avram et al.'s (2015) survey showed that job satisfaction is a partial mediator in the relationship between the perception of safety climate and organisational trust.

Job demands is an important variable in explaining the variance of safety outcomes among different categories of industrial workers (Nahrgang et al., 2010). Beyond this, the type of job demands creates differences among varied industries. In developing and meta-analytically testing the relationship between job demands and resources and burnout, engagement, and safety outcomes in the

workplace, Nahrgang et al. found that job demands impair employees' health and positively relate to burnout. They further observed among their 203 independent samples that job resources such as supportive environment motivates employees. The importance of monitoring psychosocial and physical workplace exposures such as job demands to promote worker health and safety was emphasized by Cantley, Tessier-Sherman, Slade, Galusha and Cullen (2015). Cantley et al. further revealed an independent contribution of psychological job demand and job control to injury and MSD risk among a blue-collar manufacturing cohort. To study examined associations between workplace injury and MSD risk and expert ratings of job-level psychosocial demand and job control among a large cohort (9260) of aluminium manufacturing workers. Using multivariate mixed effects models, Cantley et al. (2015) showed that workers in jobs with high psychological demand had 49% greater risk of serious injury and serious MSD requiring medical treatment, work restrictions or lost work time (RR = 1.49; 95% CI 1.10 to 2.01), compared to workers in jobs rated as having low psychological demand. Also, workers in jobs rated as having low control displayed increased risk for minor injuries and minor MSD (RR = 1.45; 95% CI 1.12 to 1.87), compared with those in jobs rated as having high control. In effect, job demands also becomes a precipitating factors to workplace injuries and MSDs (Iavicoli et al., 2014).

**Relationship between job resources and worker health and safety.** Job resources is an organisational variable which provides a buffer against the ill effects of job demands. Its pathway goes through health motivation to health outcomes. Job resources comprises supervisors and co-worker support that give workers the sense of well-being and reduce burnout and exhaustions (Okoye, & Aderibigbe, 2014; Idris et al., 2011). For instance, high quality teamwork on the

organisation level is associated with cost savings, higher workforce retention and reduced turnover (Grumbach, & Bodenheimer, 2004). High team work also occurs between co-workers and/or supervisors who are the immediate management staff to the workers. Moreover, it is important to indicate that a higher rate of turnover may be a result of stress from higher job demands, physical and psychological exhaustions bullying, harassment and injuries (O'Neill et at., 2009).

The importance of team work and its positive outcomes on the job satisfaction and other variables purported to be plus to health outcomes cannot be underestimated. This has been demonstrated by Körner, Wirtz, Bengel and Göritz (2015), when they examined the relationship between job satisfaction, organisational culture and teamwork, using SEM analysis among healthcare workers. Their results showed that 35% of job satisfaction was predicted by a structural equation model that includes both organisational culture and teamwork. The model showed that the effect of organisational culture is completely mediated by inter-professional teamwork. In this case, the team work could completely remove the ill effects of some organisational variables on worker outcomes. Other findings suggest that presenteeism is reduced by increased respect and concern for employee stress at the workplace, by necessary support at work from colleagues and employers, and by the presence of comfortable interpersonal relationships among colleagues and between employers and employees (Yang et al., 2016b). Using SEM, Yang et al. examined the effects of co-worker and supervisor support on job stress and presenteeism among aged workers in US. The analysis of large data set (1,649) indicated that the level of presenteeism was low and that of job stress was moderate among aging US workers. Further, co-

worker support and supervisor support were strongly correlated. Besides, job stress had a significant direct positive effect on presenteeism. Additionally, co-worker support had a significant direct negative effect on job stress and presenteeism. Finally, supervisor support had a significant direct negative effect on job stress but not on presenteeism.

In a similar study, job resources such as autonomy, coaching, and team climate were related to employees' levels of self-efficacy, selfesteem, and optimism, work engagement, and financial returns (Xanthopoulou, Bakker, Demerouti, & Schaufeli, 2009). The study involved data from forty-two employees working in three branches of a fast-food company. It examined how daily fluctuations in job resources relate to employees' levels of personal resources, work engagement, and financial returns. The results indicated that day-level coaching had a direct positive relationship with day-level work engagement, which, in turn, predicted daily financial returns. Additionally, previous days' coaching had a positive, lagged effect on the next days' work engagement and on next days' financial returns. Workplace coaching demonstrates the support largely from the immediate superior officers and it provides a conducive team work environment for workers. In such a case, the well-being of the workers would have resulted in low turnovers and improved financial returns (Becher et al., 2016).

The lack of or inadequacy of supervisor and/or co-worker support have serious negative implications on health and safety of workers. Accordingly, the lack of social support, particularly from supervisors and co-workers, were associated with deteriorated nurse's well-being and more unfavorable work outcomes such as job satisfaction, job security and job autonomy (Burke et al.,

2012). Burke et al. revealed that the lack of social support, particularly from supervisors and co-workers, were associated with deteriorated nurse well-being. Using a hierarchical regression, the study aimed at examining the relationship of job demands (work-family interference, emotional demands and work overload) and three sources of social support (supervisor, co-worker and spouse/partner, family and friends) with nurse well-being among 2,104 Spain nurses. This finding points out that supervisors and co-worker support provide ameliorating effects to health and safety consequences from the workplace. Thus, the support from supervisors and other workers needs to be encouraged at the all organisations. A workplace like that provides congenial working atmospheres for the workers which directly and positively affects their well-being, lowers turnover rate, and impacts financial returns.

**Conceptual Framework**

The health, safety and well-being of workers are composite factors affected by national, organisational and personal level characteristics (Lanciano, & Zammuner, 2014; Stańczak et al., 2014). However, the current research investigates only organisational and personal variables that influence the health and safety of workers, and are depicted by the "conceptual framework" (see Figure 2). The framework presents the relations among organisational PSC, job demands, job resources, company type, worker characteristics and their influence on worker health and safety. It also represents the hypothesised linkages among the latent constructs (PSC, job demands, job resources, worker characteristics and worker health and safety) being investigated.

PSC is a key determinant of the both the safety behaviours of the workers and their health and safety status. Worker safety behaviour, in itself, plays an

influential role in determining the health and safety of the workers (Dollard, & Bakker, 2010; Dallard et al., 2012ab). Thus, PSC plays dual roles, (1) by influencing worker safety behaviours and (2) through which worker health and safety are also affected (Ansah, & Mintah, 2012). Ansah and Mintah recently reported low safety behaviours among a group of fuel attendants from Sekondi-Takoradi. Further, they observed a less provision of safety measures to these attendants by their employers, especially among the local companies. Moreover, fuel station attendants face serious job insecurity where they could be dismissed with little provocation without any compensation. They also receive meager wages with basically no insurance attached to their jobs. Perhaps, these are as a result of unavailability of national comprehensive occupational health and safety policy (Annan, 2014; Clarke, 2008). Besides, the enforcement of the outdated and fragmented health and safety regulations is no more in existence in the country (Annan, et al., 2015; Puplampu, & Quartey, 2012). The availability of such OHS laws and regulations and the proper enforcement of such, by well-equipped institutions, would have lead employers to providing for workers' health and safety (Okoye, & Aderibigbe, 2014). Therefore, it is likely that fuel station attendants would perceive PSC among their organisations as low or to pose high risk (research question one).

Multinational OMCs have higher levels of PSC than local companies. PSC as an organisational factor is different at different levels of organisations. Even in most organisations there are differences in the sections or departments according to their safety climate (Zohar, & Luria, 2010). In large international organisations, employee safety including PSC is believed to be given priority (Clarke, 2008; Dollard, & Bakker, 2010). This attention given to organisational

PSC affects the health and safety of the workers (Dallard et al., 2012ab). However, small or new organisations with relatively less resources pay less attention to safety climate. Such climate tends to expose the human capital or workers to many workplace hazards (Harvard Business Review, 2013).

Senior management support and priority for worker's health and safety has severally been reported to promote health and safety of their employees (Dallard et al., 2012ab; Mauno et al., 2007). Further evidence suggests that in organisations where senior management participate actively and communicate effectively and efficiently on health and safety, workers' health and safety is much more protected. Such workers experience fewer injuries, illnesses, deaths and their economic losses to their companies (Dollard, & Bakker, 2010). Additionally, management attitude towards workers' health and safety (PSC), could also indirectly affect employees' state of health and safety. Indirectly, PSC affects workers' health and safety through the path of job demands and resources. In the organisation where there is high job demands but high safety climate, workers' health and safety are likely to be protected. The opposite is the result in a high emotionally and physically demanded workplace with minimal PSC (Bakker, & Demerouti, 2007; Idris, & Dollard, 2011). On the other hand, workers' health and safety would be safeguarded in a work environment with both high PSC and adequate job resources (Lanciano, & Zammuner, 2014). Besides, where supervisor and co-worker support are available, the effect of job demands is always mediated. Hence, supervisor and co-worker support buffer the high emotional and physical demanding work routines (Dollard et al., 2012ce; Seidler et al., 2014).

In research question two, I set out to test whether categories of fuel attendants (forecourt, shop and mechanics) differ on their perceived organisational PSC levels. The discrepancies in PSC levels may be as a result of the differences between the multinational and local companies where these attendants work (Zohar, & Luria, 2003). Moreover, research question three also states that attendants from multinational companies would have higher health and safety status more than those from the local companies. Again, the differences in organisational characteristics underscore the differences in health and safety status of the workers from various organisations (Dallard et al., 2012a). Even in the same organisation, the differences in the provision of safety at the various sections may create disparity in the health and safety state of the workers. Therefore, employees of large multinational organisations are likely to experience better organisational safety climate and accompanied health and safety effects than others in small or new companies (McTernan et al., 2013; Songstad et al., 2012).

The interaction effects of OMCs and FSSAs to testing the differences in the organisational PSC and worker health and safety of the fuel attendants was examined in research question four. Dallard et al. (2012a) in their AWB survey found significant interactions between companies and the employees on the disparities in injury rates, sickness absenteeism and presenteeism. Organisations and their workers are closely interrelated constructs and workers reflect their organisations' climate. In a similar study, Ansah and Mintah (2012) found that though safety practices of the fuel attendants from Sekondi-Takoradi were better, those from large multinational companies performed better. Moreover, they observed that these multinational organisations were more safety responsive to

their workers. These differences may be as a result of interaction effects between the workers and their companies.

The perceptions of workers towards workplace climate are also largely influenced by their characteristics such as age, gender, educational level, job and injury experience (Mahalik et al., 2009). Accordingly, young workers are said to be relatively adventurous, risk lovers and are thereby more prone to injury. For lack of working experience, they are also likely to have more health and safety problems compare to adult workers. Due to these factors, such workers are likely to perceive their organisational safety climate as less of health and safety promoting (Oltedal, & McArthur, 2011). In a similar vein, women and highly educated workers are likely to have better health and safety outcomes than men and less educated employees. Although women work in relatively safety environment, they are more mindful of inherent risks associated with their jobs. Also, they are most likely to adhere to safety rules and regulations. Furthermore, highly educated workers, independent of their jobs, also understand better and follow safety measures that safeguard their health and safety (Ansah, & Mintah, 2012; Okoye, & Aderibigbe, 2014).

In research question five, I explored whether PSC, job demands and job resources predict worker health and safety of the attendants. PSC is an organisational climate that is evidence in how a company's management supports and prioritises issues of workers' health and safety. Again, PSC comprises organisational participation and communication of health and safety of employees (Dollard, & Bakker, 2010; Idris et al., 2012). At a high level of PSC, there is likelihood of employee job satisfaction and the promotion of health and safety (Idris, & Dollard, 2011; Okoye, & Aderibigbe, 2014). In promoting worker

health and safety, the availability of job resources (supervisor and co-worker support) aid PSC and verse vice. This relation has a promotive effect on worker well-being (Bond et al., 2010). In organisations where there is high PSC, supervisors are likely to provide both physical and emotional assistance to each other. Besides, such an organisational climate encourage workers to effectively provide helpful hands to each other. Also, in such climate, worker health and safety is likely to be enhanced (Lindeberg et al., 2010; Seidler et al., 2014).

Health and safety is likely to be eroded in the presence of the high organisational job demands (Law et al., 2011; Garrick et al., 2014). Worker health and safety is compromised among employees in organisations where there are high job physical and emotional demands. A situation where job insecurity is high, job decision latitude is very low, and there is high physical demands coupled with working under various health compromising weather conditions. Even in organisations with relative high safety climate, high job demands puncture the well-being of the workers (Lanciano, & Zammuner, 2014), thereby reducing the effect of PSC. Therefore, job demands moderate by reducing the buffering effect of PSC on worker health and safety (Dollard, & McTernan, 2011).

The mediating effect of job resources and PSC on the influence of job demands on worker health and safety was tested in the research question six. The path of job resources to worker health and safety is health-enhancing (Dallard et al., 2012a). In that, in the workplaces such as fuel stations where there is high interactive supervisor-worker and worker-worker relation, there are more likely to be positive work outcomes and health (Dollard et al., 2014). Moreover, PSC is said to be an antecedent to work demands and promotes job resources. Perhaps, high psychological distress, emotional exhaustion, depression and physical health

state of workers would be positive where there is high safety climate in the organisation (Yulita et al., 2016). In this case, PSC attempts to alleviate the negative consequences of job demands on the health and safety of workers though the provision of positive safety work climate (Dollard, & Bakker, 2010; Abd Radzaz, & Bahari, 2013). On the other hand, the path of job demands to worker health and safety is health compromising (Dallard et al., 2012bc).

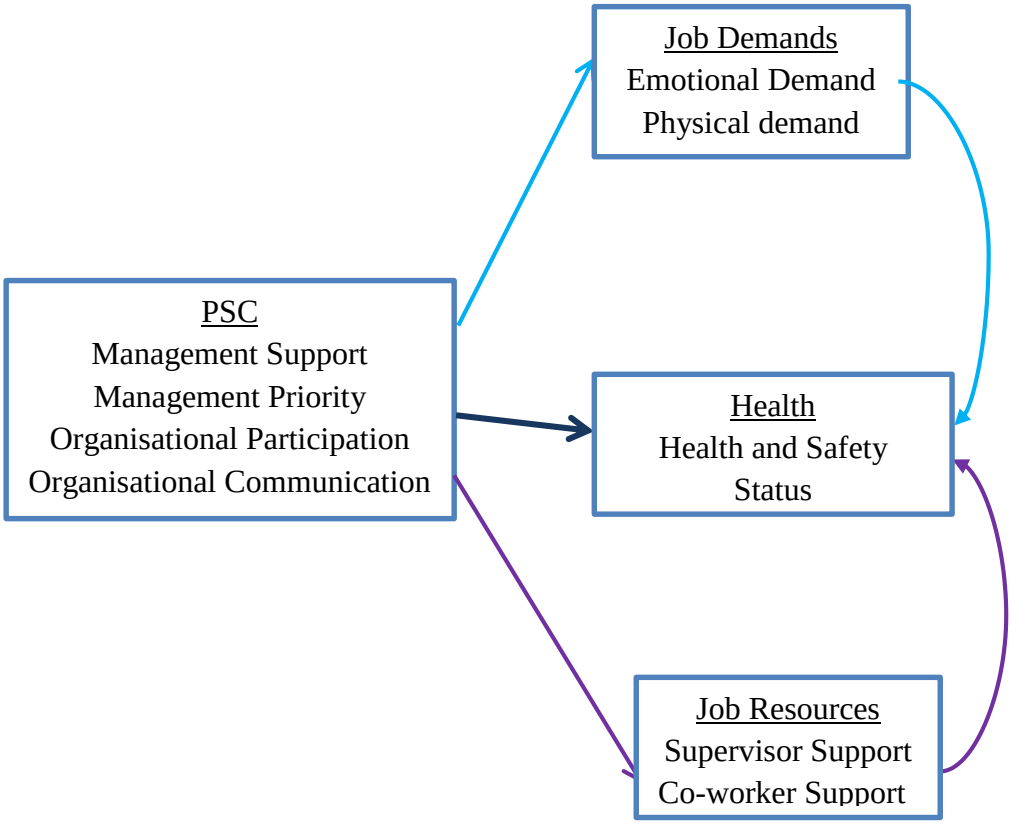


**Figure 2: Conceptual Framework (Dallard et al., 2012ab; Zohar, & Luria, 2003).**

Jobs place both physical and emotional job demands on workers. At high situation of job demands, workers are likely to experience physical and emotional strains that compromise their health and safety. However, with the presence of supervisor and co-worker support, and high positive PSC such strains are expected to be minimised (Garrick et al., 2014; Idris, & Dollard, 2011), and that the health and safety indices of the workers are expected to increase (Iavicoli et

al., 2014; McLinton et al., 2014). The interrelations among these hypothesised relationships are diagrammatically represented in Figure 2 above.

**Summary**

This study aims to explore the level of PSC at the fuel services stations in Accra, Ghana and to test the paths through which PSC predicts health and safety of these attendants. It again investigates the extent to which some background variables such as age, gender, working experience, injury rate and educational status of the attendants predict their health and safety state.

Occupational health and safety aims at creating the working environment that protects health, safety and well-being of the worker and equipment or property. It also creates a protective environment for other persons that may come in contact with the workplace. These have been the aims of management of organisations since the time of industrial revolution when workplace safety issues became known. In addition to these aims, health and safety activities now aim at promoting or increasing productivity, serve the cooperate image of organisations and place companies at competitive advantage. Attempts to achieve these aims culminated into many actions and activities at international, regional, national and organisational or corporate levels.

Occupational health and safety activities are spearheaded by the ILO and are strongly supported by the WHO. ILO and WHO singly or collaboratively formulated international conventions such as the ILO Convention on Occupational Health and Safety (1961) and Decent Work of 2012, which is goal eight in the current SDGs (Osborn et al., 2015). Many of their member nations including Ghana ratified these conventions to put measures like policies in place to safeguard the well-being of their human capital. These international

organisations assist many nations to formulate their national health and safety policies. They also provide guidelines, organise workshops and other training programmes for their member country representatives in workers' health and safety protection and promotion. Besides, they have instituted and conducted international studies into workplace problems including near misses, injuries, and fatalities. Other areas include bullying, harassments, absenteeism and presenteeism. Perhaps, they have achieved these through their member nations and their individual organisations. Most of these studies are also being conducted by the academics and other research institutions from these member countries.

Research into workplace health and safety started since the time of industrial revolution. Such attempts were geared towards the treatment of injuries and illnesses. They also involved how to promote returns to work after accidents. Research further attempted to fine suitable personal protective devices for workers. The factors affecting the use of these devices and adherence to other workplace safety regulations were equally examined by research. Furthermore, research identified workers behaviours as precursor to workplace accidents. For the past thirty years, research has also recognised and investigated organisational climate including safety climate as a forerunner to worker health and safety. However, the last ten years has experienced a paradigm shift in workplace research especially workplace psychological, where the focus is more on specific aspect of organisational safety climate. This led to the generation of the theory of PSC, as the core factor in determining the psychological health and safety and work outcomes among workers.

The theory of PSC states that workers' health and safety can be determined when the organisational PSC is known. It is mainly a psychological

workplace theory which is yet to be used in typical OHS research to study physical health and safety of workers. PSC further asserts that PSC can predict health and safety of the workers through job demands and job resources paths. Organisational PSC is a health protective factor that comprises management support, management priority, organisational participation and organisational communication of health and safety of the workers. In addition, job resources factors such as supervisor and co-worker support promote congenial working environment for workers. However, job demands which include emotional and physical demands are health-eroding path that have serious consequences on the health and safety of the workers.

Available research in safety climate in general and PSC in specific are mostly conducted by the researchers from the western world. Studies in PSC specifically are scanty. They are conducted by and among Australians, Austrians, Canadians and Pacific nations like Iranians and few by South Asians such as Singaporeans and Malaysians. Moreover, the data for these studies were collected from physicians, nurses, teachers, constructions workers, miners, bankers and some security services such police and fire service. However, available literature suggests that none of these studies have been conducted in Ghana. Similarly, there is no organisational PSC data on fuel station attendants in Accra, Ghana.

# CHAPTER THREE

# RESEARCH METHODS

The purposes of this study were to: (1) explore the level of organisational PSC among the OMCs at the fuel service stations in Accra, (2) test the paths through which PSC predicts worker health and safety of the fuel station attendants, and (3) determine the extent to which job resources and PSC mediate the influence of job demands on health and safety of the fuel service station attendants in Accra. The study futher hypothesised the significant interaction effects between category of OMC and FSSAs on the perceived PSC levels and worker health and safety of attendants and that PSC, job demands and job resources would predict worker health and safety of FSSAs in Accra, Ghana. This chapter discusses the research design used to investigate the study, the population, sample and sampling procedure employed in studying the issues. The chapter also explained the instrument used for data collection, validation and reliability of the instrument, data collection and data analysis procedures.

## Research Design

This study employed quantitative field survey to explore PSC and the paths through which it predicts worker health and safety of FSSAs in Accra. Survey research is an effective descriptive research method use for the collection of data from the "representative" sample of the target population. Surveys are also useful in describing a large population with accurate representative sample. Besides, surveys are flexible where many variables and questions are asked on a

topic at a time (Babbie, 2007; Mathiyazhagan, & Nandan, 2010). According to Babbie, and Mathiyazhagan and Nandan, survey design is considered as social scientific research which focuses on people, the vital facts of people, and their beliefs, opinions, attitudes, motivations and behaviour. Therefore, in this study I focused on describing the perceptions of the participants about organisational PSC, job resources, job demands and their health and safety state. With these aims, survey was the most appropriate methodology to use (Ogah, 2013).

It is equally important to note that dozens of studies in PSC used cross-sectional surveys of participants from the general population (Dollard et al., 2014; Hall et al., 2013; Law et al., 2011). Some other studies from specific industries or organisations included health and community service workers (Dollard, & McTernan, 2011; Idris et al., 2012), aged care industry (Winwood et al., 2013), automobile manufacturers (Azma et al., 2013), construction workers (Okoye, & Aderibigbe, 2014), drivers (Wills et al., 2009) and teachers (Garrick et al., 2014) across different cultures and segments of the population.

There are also a number of limitations associated with using descriptive survey as a research design. Mathiyazhagan and Nandan (2010, p. 1) believed that descriptive survey research design is inappropriate when studying diverse or vast heterogeneous groups. To these authors, it is difficult to utilize survey research methodology to study complex phenomena and population (unlike the population in this current study). PSC and its sub-constructs are quite simple phenomena which have being under study in recent times in Australia (Dollard et al., 2012ab; 2014), America (Garrick et al., 2014) and few countries in Asia such as Malaysia (Idris, & Dollard, 2011; Idris et al., 2012). Additionally, the population of FSSAs are organised group, under their employers OMCs and the

fuel service stations (Ansah, & Mintah, 2012). Sample selection bias can also result from the use of survey methods which may skew the data collected (Babbie, 2007; Creswell, 2009). To prevent this problem, the researcher needs to choose and apply robust statistical tools (Hair, Ringle, & Sarstedt, 2011; Henseler, Ringle, & Sarstedt, 2015).

Babbie (2007) again argued that quantitative surveys cannot be used for exploratory research where there is the need to explore meanings and feelings of people. Surveys are also limited to narratives and historical analysis of events (Choy, 2014). Notwithstanding these limitations, this study produced the depth of information needed for exploring PSC, job resources, job demands, worker health and safety and their latent variables. These constructs and their outcome measures are already established and have been tested in some populations and industries (Dollard, & Bakker, 2010; Dollard et al., 2012b). Moreover, attendants at the forecourts, shops and lube bay in Accra FSSs represent the characteristics of the general population of FSSAs in Ghana and probably Africa (Ansah, & Mintah, 2012; Monney et al., 2015).

This study was underpinned by positivist ontological and epistemological view points. From my ontological view point, I thought that PSC, job demands, job resources, health and safety status of the workers and the characteristics of the OMCs and their service stations exist independent of the workers. And that, the perceptions of the workers were only important to measure these variables. Moreover, I believed that these variables exist and will continue to exist irrespective of whether an attendant leaves or comes into any of these companies, regardless of the time. Besides, PSC and its constituent constructs are organisational variables (Dollard et al., 2012ab; 2014; Dollard, & Bakker, 2010)

that are determined not through the social construction and the interpretations of the attendants but measured as they exist and perceived by the workers (Oliver, 2010). Thus, my ontological position was not to construct or reconstruct these latent variables under investigation, but to determine the extent of their existence within the OMCs and their service stations and how they influence the health and safety of the attendants. The degree to which availability of these latent variables exist in these companies and their service stations, predict the health and safety status of these fuel station attendants, was my concern.

My epistemological view was that PSC, job demands, job resources and organisational characteristics of the OMCs and service stations can be observed and measured directly or indirectly from the perceptions of the workers, and not how they construct and interpret the existence of these variables (Jackson, 2013). The workers form the core and these workers interact actively and daily with each of these companies. These workers are the best to provide the most useful information about their companies. Therefore, I utilized standardized, valid and reliable questionnaire. In effect, quantitative methodology, specifically survey became the most appropriate means of conducting this research.

**Population**

The population for this study comprised OMCs and their fuel stations in Accra. There are about 45 licensed OMCs currently in Ghana. These companies have over 2,600 licensed retail outlets all over the country (AOMCs, 2011ab). In addition, over 90% of these companies have their head offices located in Accra. Close to 1,000 of these retail outlets are located in Accra. Accra is the capital city and the second most populated city in Ghana (Ghana Statistical Service, 2012).

It has over forty-one registered OMCs. The city holds majority of fuel retail outlets and their attendants in the country (GOIL, 2010).

Some of these OMCs include Agapet Oil, Allied Oil, Anasset Oil, AP Oil & Gas, Bano Oil, Capstone Oil Ltd, Champion Oil, Dukes Petroleum, Engen Oil Ghana Ltd, Excel Oil, Fraga Oil, Frimps Oil, Galaxy Oil, Ghana Oil (GOIL), Glory Oil, Havillah Oil, Keysens Oil Market and Manbah Gas. The rest include Merchant Oil, Modex Oil, Nasona Oil, Oando Ghana, Obiba J. K, Pacific, Shell Ghana Ltd, Sky Petroleum, Star Oil, Sonnidom Energy, Strategic Energies, Superior Oil Co, Top Oil, Total Petroleum Ghana Ltd, Trade Cross, Trinity Oil, UBI Petroleum, Union Oil, Unity Oil, Universal Oil, and Virgin Petroleum (AOMCs, 2011ab).

The OMCs, except GOIL, are private legal liability companies. They include both foreign (Total Petroleum, Shell Ghana, Virgin Petroleum, and Modex Oil) and local (Allied Oil, Union Oil, Unity Oil, Frimps Oil, Star Oil, and Glory Oil) companies. Aside establishing and operating fuel stations, some of these companies engage in oil exploration (Modex, Shell Ghana and Total Oil) and importation of crude and/or finished oil (Allied, Total Petroleum, Engen Oil Ghana Ltd) among others (AOMCs, 2011b). The outlets can be found all over the cities, towns and villages in Ghana with majority and bigger stations found in the big cities like Accra, Tema, Kumasi, Takoradi, Tamale, Cape Coast and Ho (Olaotse, 2010; Total Petroleum Ghana, 2010).

Fuel stations of OMCs are ran by station managers, assistant manager (supervisor) and mostly young energetic male and female attendants. Majority of these stations have three segment of operations and worker populations. They have the forecourt, convenient shops and lube bays (Olaotse, 2010; Total

Petroleum Ghana, 2010). In the forecourts are located fuel dispensing machines by which customers and their vehicles are served. In some stations, engine oils are also located and sold at the forecourts. In recent times, majority of these forecourts are covered with canopy roofing in the big cities. The convenience shops or marts contain products such as break fluids, insecticide sprays, wines, household products, disposals and vehicle repair equipment. The lube bays contain big channels on which vehicles stand to be repaired. Some of these lube bays have machines that are used to diagnose vehicular problems. The attendants working in most of these stations work on shift basis, either 24-hour, 12-hour or 8-hour (Ansah, & Mintah, 2012).

There are about 5740 fuel station attendants located at the various fuel stations in Accra (GOIL, 2010). This study population segmentation included 2583 forecourt service attendants, 2583 shop attendants and 574 lube bay fuel station attendants (AOMCs, 2011a). Fuel station attendants are mostly young men and women between ages 18 and 35 years. They are mostly informal unskilled workers from varying socio-economic and cultural backgrounds. Available literature indicates that majority of these attendants have secondary education (74%). Few have attained only primary (11%) and tertiary education (7%) levels (Ansah, & Mintah, 2012). According to Olaotse (2010), because fuel station attendants are mostly casual workers, they are paid less, without insurance cover, no pre-or-on service medical screening, work for long hours, with no proper health attention giving to them.

The duties of these attendants are diverse. Forecourt service attendants' duties involve refueling and washing windshields of vehicles, checking fluid levels, air pressure and replacing parts such as vehicle tires and cleaning

windshield-wiper and blades of vehicles (Chilcott, 2007). These workers also receive payment from customers, perform minor property maintenance duties such as sweeping service station lot, trimming shrubs, scrubbing service bays and opening heavy underground fuel tank covers, among others. Forecourt attendants' pre-occupation involves operating electrically controlled fuel pumps that dispense gasoline (petrol, diesel and kerosene) to vehicle owners and serving other customers. In addition, these attendants clean the dispenser (machines) on daily basis (Ansah, & Mintah, 2012).

Most of the FSSs in the big cities have mall or shops and/or lube bay attached. These shops and lube bay are usually managed by young ladies and men, respectively. The ladies in the service shops sell products including confectionaries, alcoholic beverages and many other products desired by customers. These ladies also perform cleaning jobs at the shops, with some carrying loads during shop stocking. The mechanics at the lube bays wash and repair motor vehicles and perform any needed services on vehicles. They may also repair any broken down machine at the station. These duties get mechanics in regular contact with various petroleum products including engine oils, petrol, diesel and many others (Abu et al., 2015; Onunkwor et al., 2004).

Almost all FSSAs work on shift basis. On many occasions, all the fuel station attendants carry out their duties by standing for many hours. Their jobs also expose them to different workplace and weather conditions and various characters of clients (Clarke, 2006). Some customers abuse attendants (physical and verbal) causing both physical and psychological health problems (Clarke, 2010; Dollard, & Neser, 2013). The attendants in the study were from the various OMCs such as Total Ghana Limited, Shell Ghana Ltd, GOIL and Allied Oil.

Other companies include Glory Oil Company Limited, Star Oil Company Limited, Frimps Oil Company Limited.

**Sample and Sampling Procedure**

A sample of 876 FSSAs, representing about 15% of the total population (5740), was studied in this research. The sample size selection for the study was not based on a priori determination by statistical power and/or effect size calculations. It was dependent on the proportion of the population used by most of the researchers in the fields of OHS, organisational health with PSC as emphasis (Dollard et al., 2012ac; Zohar, & Luria, 2003). This is because calculating effect sizes apriori is based on the assumption that sample distribution is normal (Selya, Rose, Dierker, Hedeker, & Mermelstein, 2012). However, in the current study, power and effect sizes were also not calculated apriori since the normality could not be determined before data collection (Cohen, 1988). Besides, 15.3% of the sample chosen was deemed adequate in the organisational study (Dollard, & Bakker, 2010; Dollard et al., 2012ab; Idris et al, 2011). Furthermore, this sample (876) appropriately represents the population, and thus making the results of the study more accurate and reliable (Araujo, & Froyland, 2007). Moreover, Fraenkel and Wallen (2000) pointed out that a sample of 100 or more participants is enough for making meaningful inferences from descriptive studies.

The participants comprised 49% ($n$ = 426) forecourt attendants out of sub-population of 2583, 28% ($n$ = 245) of shop attendants from a sub-population of 2583 and 23% ($n$ = 205) of lube bay mechanics from 574 sub-populations. Specifically, there are 25% ($n$ = 220), 21% ($n$ = 187), 20% ($n$ = 172) and 34% ($n$ = 297) of the fuel station attendants sampled from the Total Oil, Shell, GOIL and Allied Oil, respectively. Furthermore, this sample included 56% ($n$ = 492) male

and 45% ($n$ = 384) female attendants. Age of the participants range from 15 to 66 years ($M$ = 28, $SD$ = 6.5).

The working experiences of the fuel servicestation attendants range from less than one year to about 21 years. They included 73% ($n$ = 641) singles and 27% ($n$ = 235) married men and women. Besides, they included 13% ($n$ = 115) of attendants who either had no formal education or had only basic education, 10% ($n$ = 83) experienced some vocational education, 67% ($n$ = 588) had secondary education and 10% ($n$ = 88), tertiary level education. Furthermore, 16% ($n$ = 136) of the attendants described their overall health status as either poor or very poor, 21% ($n$ = 181) fair (not poor and not good), 37% ($n$ = 325) good, with the rest 26% ($n$ = 234) describing it as very good or excellent health. Meanwhile, the female fuel station attendants reported poorer health status ($M$ = 4, $SD$ = 1.159) than the males ($M$ = 3.86, $SD$ = 1.197).

These fuel station attendants experienced various forms of accidents and injuries. Of the 876 participants, 23% ($n$ = 198) reported having sustained injuries at their stations while 77% ($n$ = 678) do not. Meanwhile, while 40% ($n$ = 384) reported having had no form of accident at their stations, 13% ($n$ = 112) had had vehicle accidents. Furthermore, 31% ($n$ = 267) reported regular customer abuses, 10% ($n$ = 83) fire outbreaks, 4% ($n$ = 37), armed robbery and 3% ($n$ = 29) major oil spillage. The fuel station attendants also work at different shifts. The shift systems run in these fuel outlets showed that, 70% ($n$ = 611) work 24-hour shift, 25% ($n$ = 217) 12-hours a day, 3% ($n$ = 30) three or more continuous days per week, 1% ($n$ = 12) eight hours a day and 1% ($n$ = 6) only a night.

The OMCs were selected purposively for the research. Allied Oil, GOIL, Shell Ghana Limited and Total Petroleum Ghana Limited were chosen purposively

for the study because of their long standing experiences. Total Petroleum Ghana Limited and Shell Ghana Limited (SGL) are multinational OMCs operating in Ghana before independence (Ghana News Agency, 2011). Goil, on the other hand, is a Ghana government owned company that started its operations as far back in June 1960. Besides, Allied Oil is one of the first indigenous OMCs in Ghana. Allied started its operations in oil marketing in October 1998. Furthermore, these OMCs have over 97% of the shares of Ghana's downstream oil sector (Prempeh, 2010). By this, they employ the large number of the fuel station attendants and have more service stations located in Accra. These companies also have written goals of which health and safety of their employees are integral components (GOIL, 2006). Also, the companies engage in education, environmental reengineering, provision of safety equipment and many other measures to promote the health and well-being of the employees.

The fuel service stations and their attendants were conveniently sampled from the selected OMCs. The OMCs and their dealers build and establish these fuel outlets along the major streets of Accra. Futhermore, these fuel stations are not located in any order along the streets to permit random selection according to the OMCs chosen. Moreover, there are several of such fuel outlets coming up each time. Besides, the job at the fuel service station is busy. This does not provide enough space for the fuel station attendants to attempt filling a questionnaire. Filing the instrument at home could pose a problem since most of these workers run a 24-hour shift which makes them too tired (Monney et al., 2015). Therefore, it was only those workers who were a little "free" at a point and colud fill the questionnaire did so.

The limitation to generalise the findings and conclusions from studies using non-probability sampling methods such as purposive and convenient sampling has been argued by some early ressarchers (Babbie, 2007; Ogah, 2013). However, these methods are common in the field of organisational health and safety research (Idris et al., 2015; Juarez-Garcia et al., 2015). The results, findings and conclusions from these early studies are valid and generalised to a particular worker population studied (Idris, & Dollard, 2011). For instance, among public and private employees of Malaysia, Idris and Dollard used both purposive and snowball sampling procedures in choosing their sample. In a similar survey in Uganda, Mangasi (2009) used voluntary sampling method in selecting the participants. Thus, the ability to make generalisation from the results, findings and the conclusions from this research to the population of OMCs, fuel stations and their attendants in Accra, cannot be in question.

**Instrument for Data Collection**

The questionnaire used for this study was developed based on the AWB survey and the theory of PSC (Dollard, & Bakker, 2010; Dollard et al., 2012a). Items measuring PSC were taken from PSC 12 survey (Hall et al., 2010). PSC was constructed and measured with the following constructs; management support, management priority, organisational participation and organisational communication, towards health and safety promotion of the workers (Dollard et al., 2012bc; Idris et al., 2012). Physical health and safety items were adopted from Short Form Health Survey (Ware, Kosinski, Dewey, & Gandek, 2001). Moreover, job resources (supervisor and co-worker support) and job demands (physical and emotional demands) items were adapted from Job Content Questionnaire (Karasek et al., 1998).

These previous instruments were formulated mostly based on relevant theories and models such as PSC theory, JD-R theory and Demand-Control model (Bakker, & Demerouti, 2007). They are valid and reliable across continents, nations and industries (Bailey et al., 2015a; Choi, Ko, & Ostergren, 2015; Dollard et al., 2012c; Juarez-Garcia et al., 2015). For example, Villalobos, Vargas, Rondon and Felknor (2013) recently confirmed the validity and reliability of psychosocial risk factors for health questionnaires with 2360 Colombian workers and reported reliability coefficients between 0.88 and 0.95. Moreover, factor analysis confirmed the dimensions proposed in their measurement model such as management priority, commitment, and organisational communication. Besides, they observed that the current validity resulted in significant correlations with stress and health symptoms.

The current study utilized this 51 item questionnaire to study PSC of OMCs and their service stations and health and safety of FSSAs in Accra. The questionnaire was divided into sections A, B and C (see Appendix A; questionnaire for fuel service station attendants). Section A of the instrument has 10 items (1-10) that measured participants' socio-demographic characteristics such as gender, age, education, marital status, company they work for, years of working experience, attendants category, experience of workplace accidents, experience of injury, type of shift run. The items were mostly multiple choice types. Participants responded by placing a mark in the boxes provided for the multiple choice types items while they wrote in the space where such was the demand.

Section B of the questionnaire contained nine items (11-19). These items measured physical health and safety state of the participants. The physical health

and safety construct was the first sub-construct that measured worker health and safety, second being psychological distress. Health and safety part of this section was constructed on 5-point rating scale. The scales are different for most of the items. For instance, item number 14 had responses classified as none (5), very mild (4), mild (3), severe (2) and very severe (1) while number 16 had them as very much (5), quite a lot (4), some (3), a little (2) and none (1). Meanwhile, item number 19 had its responses as not at all (5), very little (4), a little (3), quite a lot (2) and could not do daily activities (1). Thus, a higher score such as 5 or such aggregation indicates a better health and safety status of the participant (Ware et al., 2001). But the item that measured the overall health status of the participants had six-point scale (1-6); very poor, poor, fair, good, very good and excellent. A higher score (6) on this item indicats a better health and safety status of the fuel service station attendant. For all the items in this section, the participants responded by circling the best option that described their perceptions.

The section C of the instrument comprised 32 items (20-51). This section measured PSC (20-31) job resources (32-39) and job demands (40-51). PSC was measured with (a) senior management commitment and involvement in relation to stress prevention practices; (b) management priority measures perceived by employees, how management values employee health and safety in comparison to productivity goals; (c) organisational communication, encompasses processes for employees to provide feedback on psychological wellbeing; and (d) organisational participation, relates to consultation regarding health and safety issues with employees, their unions and health and safety representatives (Dollard et al., 2012a). Participants responded on a four-point rating scale from 1 (strongly disagree) to 5 (strongly agree).

The participants' health and safety scores are rated 1-5. In aggregation, it ranges from a minimum of 5 to a maximum of 40. In this caese, a lower score means the presence and compromised health and safety of the attendants (Ware, et al., 2001). In addition, PSC is aggregated as a single score from 12 measuring items (20-31). Measuring score of PSC is based on benchmark which uses the mean scores of the items (Sobel, 1982). This benchmanrk classifies PSC as high or low or no risk (41 and above), moderate risk (37.99-40.99) and low or high risk (36.99 and below) and thus, reported as such. Currently, many researchers used this benchmark in the measurement of organisational PSC (Bailey et al., 2015a; Garrick et al., 2014). Therefore, the mean PSC score of 36.99 and below indicates that the OMC and its FSSs do not adequately support procedures, practices and processes that actively promote positive employee health, safety and well-being (Dollard et al., 2012a). Perhaps, the fuel service stations provide a risky safety climate, including psychosocial climate, to the fuel station attendants (Abd Radzaz, & Bahari, 2013).

Meanwhile, as job resources are measured with eight (8) items (32-39), job demands had 12 items measuring them (40-51). Besides, job resources' aggregated scores ranged from 8-32. Job demands' aggregated scores from the 12 items ranged from 12 to 60. Moreover, job resources and job demands were measured with supervisor (32-35) and co-worker support (36-39), emotional (40-45) and physical demands (46-51), respectively (Bakker, & Dollard, 2010; Dollard et al., 2014; 2015). A high aggregate score indicates a relative presence of job resources and job demands. High presence of job resources indicate a probable adequacy of support received from both supervisor and that which exist among the fuel station attendants. On the other hand, high score of job demands

reveals the devastating effect of both physical and emotional workload on the fuel station attendants (Abd Radzaz, & Bahari, 2013). The high presence of job resources provide buffer for health and safety of these attendants but high job demands erode it (Bailey et al., 2015a; Juarez-Garcia et al., 2015).

**Pilot study**

Piloting the study was essential to test the appropriateness of the questionnaire and answer all the research questions and test hypotheses prior to the main study. The questionnaire was distributed to 50 fuel service station attendants in Cape Coast. These workers were given three days to return the filled questionnaire, which I went back to retrieve. The workers were encouraged to read thoroughly and make suggestions for correction where they deemed necessary. Attendants' feedback and suggestions were used to revise the questionnaire.

Appropriate data screening and coding preceded statistical data analysis (Huck, 2008; Ofori, & Dampson, 2011). The analysis involved the use of SPSS version 16.0 and Smart-PLS software (Hair et al., 2011; Ringle, Wende, & Becker, 2015). The research questions and hypotheses were statistically analysed and results presented. In addition, construct validity and reliability of the questionnaire were examined.

**Construct validity of the instrument**

Establishing the construct validity of the current questionnaire became necessary since the questionnaire items were selected and pulled together from different survey instruments. Though matured, these instruments have been developed and tested with very different workers, organisations and nations (Hall et al., 2010; Ware, et al., 2001). Therefore, this validity helped to assess the factor

structure of the current instrument (Sounan et al., 2012) and "tap" the various constructs being measured (Field, 2005). The current questionnaire measures PSC, job resources, job demands and worker health and safety at interval scale, and worker and organisational characteristics at nominal levels. Thus, the data collected was taken through confirmatory factor analysis (CFA) using principal component factor analysis with Varimax orthogonal rotation (Field, 2000).

The factor analysis using the principal component analysis with orthogonal rotation (Varimax) yielded four factors; PSC, job demands, job resources, and health and safety. These constructs together accounted for 63% of the variance extracted by the instrument (Field, 2000). The first factor PSC composed of 12 items and accounted for 25% of the variance. The second factor, job demands had six items and extracted variance of 14%. The third factor, job resources had eight items and had 13% variance extracted. The fourth fator, health and safety had six items and recorded the least (11%) variance extracted.

The initial loadings in the rotated component matrix indicated that eight items jd_2, jd_3, jd_5, jd_7, jd_9 and jd_12 under job demands and, heal_4 and heal_7 under health and safety did not meet the cut-off point of 0.5. These items were subsequently removed from further analysis. Furthermore, statistical analyses of research question 1, hypotheses 1, 2, and 3 are based on these factors and their items. Analyses of hypotheses 4 and 5 involved the use of Structural Equation Modeling, Partial Least Squared (SEM-PLS). This technique has its own validity and reliability processes and criteria (Ringle et al., 2015; Henseler, Ringle, & Sinkovics, 2009). The four factors and the items comprising them and their alpha and composite reliability co-efficient values are presented in the table 1 below.

**Table 1: Item Listings, Factor Loadings, Alpha and Composite Reliabilities and Communalities for the Four Factors; PSC, Job Demands, Job Resources, and Health and Safety**

| Factors | Factor Loadings | | | | Communality |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| **Factor 1: PSC ($\alpha$ = 0.95; CR=0.95)** | | | | | |
| PSC_1 | 0.77 | | | | 0.60 |
| PSC_2 | 0.74 | | | | 0.55 |
| PSC_3 | 0.81 | | | | 0.66 |
| PSC_4 | 0.71 | | | | 0.54 |
| PSC_5 | 0.83 | | | | 0.69 |
| PSC_6 | 0.86 | | | | 0.75 |
| PSC_7 | 0.79 | | | | 0.66 |
| PSC_8 | 0.76 | | | | 0.62 |
| PSC_9 | 0.79 | | | | 0.67 |
| PSC_10 | 0.82 | | | | 0.69 |
| PSC_11 | 0.81 | | | | 0.68 |
| PSC_12 | 0.74 | | | | 0.56 |
| **Factor 2: JD ($\alpha$ = 0.92; CR=0.95)** | | | | | |
| JD_1 | | 0.79 | | | 0.64 |
| JD_4 | | 0.87 | | | 0.79 |
| JD_6 | | 0.76 | | | 0.58 |
| JD_8 | | 0.85 | | | 0.74 |
| JD_10 | | 0.87 | | | 0.77 |
| JD_11 | | 0.85 | | | 0.75 |
| **Factor 3: JR ($\alpha$ = 0.86; CR=0.91)** | | | | | |
| JR_1 | | | 0.56 | | 0.53 |
| JR_2 | | | 0.68 | | 0.62 |
| JR_3 | | | 0.68 | | 0.55 |
| JR_4 | | | 0.72 | | 0.58 |
| JR_5 | | | 0.74 | | 0.55 |
| JR_6 | | | 0.65 | | 0.45 |
| JR_7 | | | 0.77 | | 0.60 |
| JR_8 | | | 0.68 | | 0.47 |
| **Factor 4: H&S ($\alpha$= 0.86; CR=0.92)** | | | | | |
| H&S | | | | 0.78 | 0.69 |
| H&S | | | | 0.82 | 0.77 |
| H&S | | | | 0.79 | 0.64 |
| H&S | | | | 0.67 | 0.63 |
| H&S | | | | 0.77 | 0.60 |
| H&S | | | | 0.60 | 0.50 |

**Key: JD = Job Demands, JR = Job Resources, H&S = Health and Safety, CR = Composite Reliability**

**Reliability of the instrument**

The internal consistency reliability of the items was tested and reported using the pilot data. The instrument recorded overall Cronbach alpha reliability of 0.86 with 0.95, 0.92, 0.86 and 0.86 for the PSC, job demands, job resources and health and safety constructs, respectively. In spite of these high alpha reliability (Ogah, 2013), its weakness demanded the computation of composite and indicator reliabilities, and convergent validity (Henseler, et al., 2009). According to Hair et al. (2011), and Nunnally and Bernstein (1994), alpha is a weak measure of instrument reliability since it operates on an assumption that the items are measured without errors and hence are equally reliable. Moreover, in alpha, the items load at the same rate. These assumptions accordingly are false. Therefore, composite and indicator reliabilities are better options with acceptable loadings of above 0.70 and 0.60, respectively. In addition, convergent validity with the average variance extracted (AVE) higher than 0.50 is equally acceptable. The current instrument met all these criteria (Chin, 2010; Hair, Sarstedt, Ringle, & Mena, 2012). Thus, the composite reliabilities of PSC = 0.95, job demands = 0.95, job resources = 0.91, and health and safety = 0.92 and convergent validity of the constructs are also acceptable, PSC = 0.65, job demands = 0.76, job resources = 0.72 and health and safety = 0.66 (Dijkstra, & Henseler, 2015; Garson, 2016).

**Data Collection Procedures**

Collection of data proceeded after the research protocol had been approved, ethical clearance gained and the necessary permissions sought. Data collection took place at the various service stations with assistance from two trained research assistants (RA). I trained the RAs on the purposes of the study

and how to gain entry into the various fuel service stations. They were further tutored on how to build rapport and give respect to the station officials and attendants. Training was also provided to the RAs about how to interpret the question and guide few participants who may not be able to read and understand. The training involved back-to-back interpretation of the questionnaire and insulating one's judgment from influencing the interpretation. The members of the research team distributed the questionnaire to the attendants face-to-face at their stations. Fuel station attendants were given three days to return the filled questionnaire to their various workplaces for collection by the research team members. At some stations, the managers or supervisors assisted in the distribution and collection of the completed questionnaire. In situations where a fuel service station attendant could not read and write or too busy to fill the instrument, the members of the research team assisted. Data collection took place from the third week of March 2016 through to the end of May 2016.

Data collection showed 73% return rate. This was not a surprise since work at fuel stations is a busy one (Ansah, & Mintah, 2012). Moreover, because these fuel attendants work 24-hours (Monney et al., 2015), they get too tired and desire rest, in the process forget to fill the questionnaire.

Research ethics involve the protection of dignity and anonymity of participants and the publication of their information (Fouka, & Mantzorou, 2011). To achieve this, the research protocol was approved by the Institutional Review Board (IRB) under the Directory of Research, Innovation and Consultancy (DRIC), University of Cape Coast. The ethical clearance sought from DRIC (see Appendix B; ethical clearance –ID:UCCIRB/CES/2016/03) paved way for the data collection. I also collected an introductory letter from the department of

HPER, UCC (see Appendix C; introductory letter). The documents obtained (ethical clearance and introductory letter) enabled me to introduce myself to the Heads of the OMCs, the stations managers and the attendants. Again, I sought permission from the management of Allied Oil, GOIL, Total Oil and Shell to conduct the study at their station and with the fuel station attendants.

I sought permission from the attendants to conduct the research with them. In addition, inform consent form was made available to the participants. The attendants were informed of the voluntary nature of the study and that no monetary gain was attached. They were further assured of anonymity and confidentiality of the study and on no occasion should they write their names. Participants were also informed that this study was purely for academic exercise. Furthermore, there was going to be pool data analysis where no individual participant or station could be singled out. Attendants willing to partake in the study duly signed the informed consent form before attempting the questionnaire.

**Data Analysis**

Data was screened for missing values, univariate and multivariate outliers using frequency distributions and box plots. Also, the data was checked for Bartlett's Test of Sphericity and for regression slope (Huck, 2008). Bartlett's Test of Sphericity was not significant, an indication of low correlation between the DVs of OMCs and FSSAs. This means they can be analysed together in a single model without cross interaction. The SPSS version 16 software was utilized at this stage for the analyses.

The missing values for quantitative data were replaced using the serial means while median of nearby points procedure was used to replace the missing qualitative data. According to Huck (2008), the most appropriate statistics to

replacing missing values in interval and/or ratio data such as PSC, job demands, job resources and health and safety, is serial means (the average). Besides, Babbie (2007) contends that it is best to replace missing values in categorical data like type of attendant, OMCs, educational level and sex with median of nearby points. Histograms with normal curves were employed to test normality and revealed that data collected met this assumption. In addition, homogeneity of variance was assessed using the Leven's test of equality of error variance for PSC, and health and safety of the fuel station attendants. The result produced a significant *p*-value and therefore homogeneity of variance could not be concluded. Hence, fuel attendants in Accra constitute a heterogeneous population from which this sample was drawn (Ofori, & Dampson, 2011). The few outliers identified were removed since that was far less than 5% of the data collected. This removal did not impact the data negatively since sample was large enough (Tabachnick, & Fidell, 2007).

**Research question one: What is the level of PSC at OMCs and FSSs in Accra, Ghana?**

In this research question, I sought to measure the level of PSC among the OMCs and their FSSs. PSC was aggregated as a single score from 12 measuring items. The question was answered based on the AWB survey standards or benchmarks (Dollard et al., 2012a). This benchmark uses the mean scores of PSC as proposed by Sobe (1982). Thus, each OMCs' organisational PSC mean score was calculated and reported as having a low risk, moderate risk or high risk. Furthermore, to indicate the overall organisational PSC of the companies together, the grand mean score was reported based on the benchmark.

**Research question two: What differences in PSC exist among departments of FSSAs in Accra, Ghana?**

Research question two investigated whether the various categories of fuel attendants' perception differ on their organisation's PSC levels. PSC as the DV produced a single continuous score for each participant for this analysis. In addition, fuel service station attendants (forecourt, shop and lube bay attendants) formed the IV. The research question had one categorical IV at three levels (forecourt, shop and lube bay attendants) and an interval data DV (PSC) and thus, One-way ANOVA was preferred for this analysis.

The *F*-statistic and other parameters including partial eta squared ($\eta^2_p$), degree of freedom (*df*), alpha or *p*-values, means (*M*) and standard deviations (*SD*) were reported in testing this research question. Where a statistical difference among the category of FSSAs on their PSC level exist, a Bonferroni post hoc analysis was conducted. The post hoc test enabled the identification of the specific two groups within which the differences existed (Huck, 2008). In addition, Cohen's (1988) effect size using $\eta^2_p$ was calculated to test the magnitude of existing differences among the group of FSSAs on their PSC levels. According to Cohen's criteria, a value of 0.01 indicates small, 0.06 medium and 0.14 large (Cohen, 1988).

Bonferroni post hoc analysis was chosen because it was relatively conservative as compared with liberal Tukey and more conservative Cheffe (Huck, 2008; Ofori, & Dampson, 2011). Furthermore, $\eta^2_p$ effect size was chosen and reported because it made use of population variance rather than the sample variance, as used by eta squared ($\eta^2$). The use of sample variance in such analysis limits the ability of the results, findings and conclusions to be generalized to the

larger group beyond the sample. Therefore, $\eta^2_p$ creates room to make generalization from the results, findings and conclusion from the study (Kotrlik, Atherton, Williams, & Jabor, 2011).

**Research question three: What differences exist in health and safety status of FSSAs from different OMCs in Accra, Ghana?**

Research question three examined the differences in health and safety status among the various categories of FSSAs. The IV was the FSSAs at three levels (forecourt, shop and lube bay attendants) while worker health and safety formed the DV. Moreover, while FSSAs was categorical variable with three levels, worker health and safety formed a single quantitative score aggregated from eight rated scale items. Thus, one-way ANOVA became the most appropriate statistical stool to use for this analysis (Huck, 2008).

Parameters such as the *M*, SD, $\eta^2_p$, *df* and alpha or *p*-values and *F*-statistic were reported. The decision on the significant difference among the groups was based on the higher *M*, *F*-statistic, and the significance *p*-value ($< 0.05$). Furthermore, post hoc analysis using Bonferroni was conducted to identify the two groups within which such differences exist (Huck, 2008). Bonferroni after analysis was preferred since it was relatively a conservative test (Ofori, & Dampson, 2011). Moreover, Cohen's (1988) effect size using $\eta^2_p$ was estimated to test the magnitude of the existing practical difference between each two groups with a significant difference. The test further demonstrated the proportion of variance accounted for by each IV and error variance in the ANOVA model (Kotrlik et al., 2011).

**Research question four: What interaction effects exist among categories of OMCs and different FSSAs on PSC levels and worker health and safety of attendants in Accra, Ghana?**

In research question four, I tested the interaction effects of the type of OMCs and type or department of FSSAs on their perceived PSC levels and health and safety status of the service attendants. The IVs included OMCs (Allied Oil, GOIL, Shell and Total Oil) and departments of FSSAs (forecourt, shop and lube bay service attendants). In addition, the DVs, measured on continuous, included organisational PSC and health and safety status of fuel station attendants. Hence, factorial multivariate analysis of variance (MANOVA) was preferred for the analysis. The first consideration of MANOVA was to explore if a significant interaction effects exist among the IVs. Second, if this significant interaction exists does to what extent it create any significant difference in the DVs of orhanisational PSC and health and safety status of the fuel service attendants (Huck, 2008). However, the main effects was evaluated where no significant interaction effect existed between the two IVs in creating a further significant difference in the organisational PSC level and health and safety status of the service station attendants. The main effect was a one-way ANOVA analysis where differences in the IVs as function of DVs were tested separately (Field, 2005).

The data was explored for outliers, multivariate normality, homogeneity of variance-covariance and regression slope. All assumptions were suppose to be met and to warrant the use of MANOVA as the "best" statistical tool for the analysis (Huck, 2008). The homogeneity of variance-covariance would not be concluded when the DVs are not equal across the groups. Hence, Pillar's Trace statistic would be reported (Kotrlik et al., 2011). In this analysis, the *F*-statistic,

and other parameters such as the *M, SD, df, p*-values and $\eta^2_p$ were appropriate to be reported (Field, 2005).

Research questions 5 and 6 were tested using PLS-SEM, a second generation multivariate analytical tool (Hair et al., 2012; Ringle, Sarstedt, & Straub, 2012), with use of the software Smart-PLS (Ringle et al., 2015; 2005; Wong, 2013). Research question 5 explored the extent to which PSC, job demands and job resources predicted health and safety of fuel station attendants. It further tested the paths through which PSC predicted health and safety of these service station attendants. In addition, research question 6 examined the mediating role of the job resources and PSC on the effect of job demands on health and safety of the fuel station attendants.

**Ressrach question five: To what extent do PSC, job demands and job resources predict worker health and safety of FSSAs in Accra, Ghana?**

Research question five explored the extent to which PSC, job demands and job resources predict health and safety of the fuel station attendants (see Figure 3). In this model, the IVs included PSC, job demands and job resources while health and safety served as the DV. PSC, job demands and resources are quantitative latent variables measured with 12, 12 and 8 quantitative measurement indicators, respectively. Moreover, all these latent variables were reflectively modeled; all arrows pointing away from variables to their respective indicators (Hair et al., 2012; Hair et al., 2011; Ringle, Sarstedt, & Straub, 2012).

The evalution or assessement of models in PLS-SEM was done and reported separately for both the outer and inner models (Hair, Ringle, & Sarstedt, 2013; Ringle et al., 2012). The evaluation of reflective outer model begins with verifying both the reliability and validity, of the indicators (Hair, Hult, Ringle, &

Sarstedt, 2014a; Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014b). The reliability of each of the indicators was assessed where their standardized or cross-loadings were acceptable if higher than 0.60 (Hair et al., 2014a; 2011).

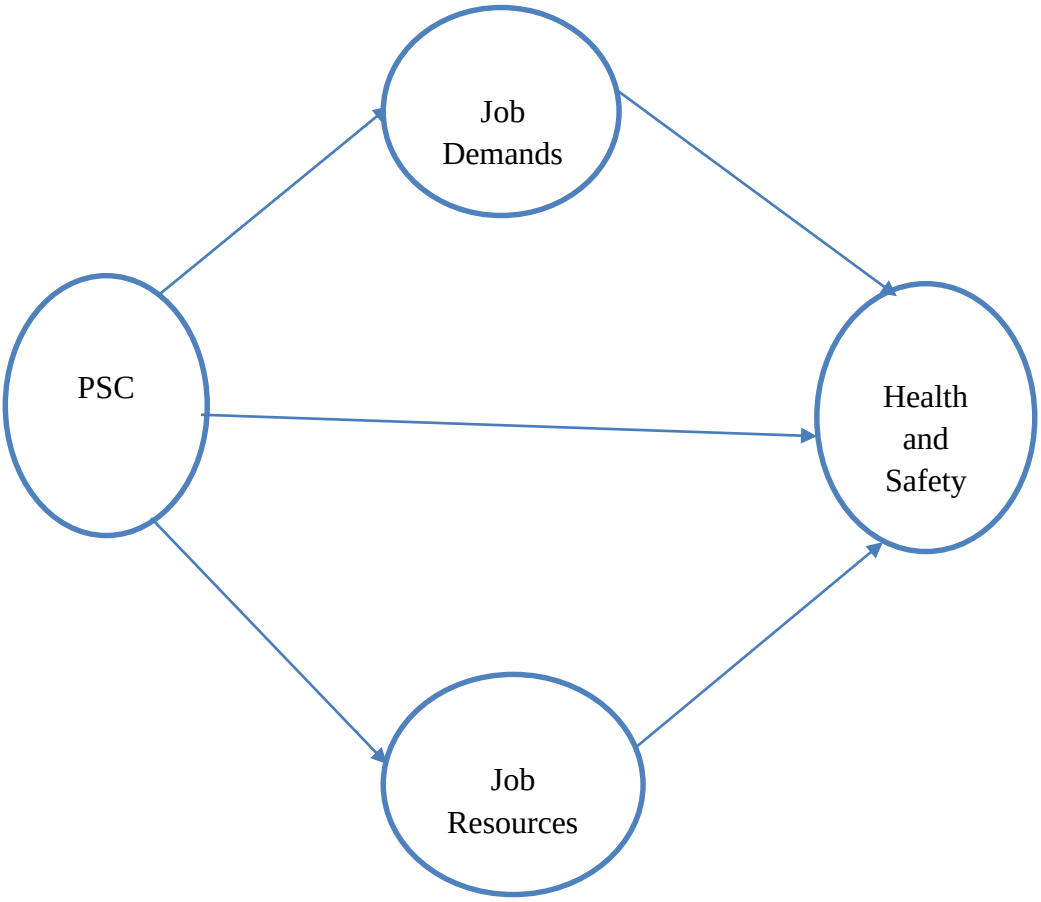


**Figure 3: The Power of PSC, Job demands and Job Resources Predicting Health and Safety**

The second step of evaluating reflective indicators or the outer model was the assessment of validity. This involved the examination of the convergent validity and discriminant validity of PSC, job demands, job resources and health and safety measurement indicators (Henseler et al., 2015; Wong, 2016). Convergent validity is assumed when each item has outer loadings above 0.70 and when each construct's AVE is 0.50 or higher. The AVE is the grand mean value of the squared loadings of a set of indicators in a model (Ringle, & Sarstedt,

2016). For instance, an AVE of 0.50 indicates that the construct explains more than half of the variance of its measurement indicators (Hair et al., 2013).

Discriminant validity represents the extent to which a construct such as PSC is empirically distinct from other constructs such as job demands, job resources and health and safety. It also represents the extent to which a construct measures what it is intended to measure (Hair et al., 2012). Discriminant validity was assessed using the Fornell and Larcker (1981) criterion. This method is based on the assumption that the construct like PSC shares more variance with its indicators than with any other construct such as like job demands, job resources and health and safety in the PLS model. This requirement was tested for by the AVE of each construct. The AVE values for each latent variable should be higher than the highest squared correlation with any other construct. For instance, AVE of PSC should be higher than the highest squared correlation of job demands, job resources and worker health and safety.

The next stage involved the assessement of the cross loadings of the indicators (Henseler, Ringle, & Sarstedt, 2012; Rigdon, 2014). Thus, the loadings of each indicator on its construct such as job demands should be higher than the cross loadings on other constructs such as PSC, job resources and health and safety. Furthermore, these loadings are acceptable when they are 0.70 or higher. On the other hand, an indicator loading less than 0.60 is removed, especially if the instrument is new or not matured (Henseler et al., 2009; Matthews, Sarstedt, Hair, Ringle, 2016). It is important to indicate that the efficiency of the outer models is a pre-requisite to the assessment of the inner or the structural model (Shumaker, & Lomax, 2010).

The structural model tested the relationship between the latent constructs; PSC, job demands, job resources and health and safety of the fuel station attendants. The evaluation of reflective inner models involve the assessment of the coefficient of determination ($R^2$), path coefficients, cross-validated redundancy ($Q^2$), and the effect size ($f^2$). That is, in this analysis, the structural model evaluation was based on the ability of the PSC, job demands and job resources to accurately predict the health and safety status of the fuel station attendants (Hair et al., 2014ab; 2013)

The first step in the assessment of the inner model involved the evaluation of the $R^2$ (Henseler et al., 2012; Ringle et al., 2011). This measures of the model's predictive accuracy with its predictor latent constructs such as PSC, job demands and job resources. The evaluation criteria for $R^2$ range from 0 to 1 and values of 0.75, 0.50 or 0.25 present substantial, moderate, or weak levels, respectively, of predictive accuracy of the constructs in the model (Hair et al., 2011; Henseler et al., 2009). However, because of the weakness of 'consistency at large' of $R^2$, adjusted $R^2$ ($R^2_{adj}$) was also considered and reported. The 'consistency at large' is that tendency of the $R^2$ values to keep increasing as a result of addition of a latent construct or more to the PLS model. In this case, $R^2$ is not a stable indices (Rigdon, 2014). However, $R^2_{adj}$ value is not inflated when the model becomes complex or a latent variable is added. Rather, $R^2_{adj}$ values are controlled as latent constructs increase and models become complex (Hair et al., 2014a).

The second step of the inner model evaluation involved the assessment of $Q^2$ (Hair et al., 2014a; Wong, 2013). This procedure used the blindfolding in the PLS software (Henseler et al., 2012). It assessed the inner model's predictive relevance (Hair et al., 2014b). For a particular endogenous construct such as PSC,

job demands or job resources, $Q^2$ value greater than zero indicates the path model's predictive relevance for that construct (Rigdon, 2014; Wong, 2016).

The third step involved the evaluation of the path coefficients of the inner or the structural model. Path coefficients represent the hypothesized relationships linking the constructs PSC, job demands, job resources and health and safety in the PLS model (Hair et al., 2014a). The path coefficients were estimated based on values +1 to -1, after running a PLS model algorithm. For example, coefficients value closer to +1 represents strong positive relationships and -1 indicates strong negative relationships. In addition, standard error was obtained using bootstrapping procedure to test the significance and the strength of each path in the PLS model. A path's strength is significant and depends on its value if higher than 1.96 at 0.05 (Hair et al., 2014b). Hence, the predictiveness and the relevance of PSC, job demands and job resources are dependent on the path coefficient values and standard errors between the PSC, job demands and job resources and the health and safety of the fuel station attendants (Sarstedt, Hair, Ringle, Thiele, & Gudergan, 2016).

The finally step of the inner model assessment involved effect size ($f^2$) evaluation. Effect size is the practical significant contribution each of the latent variables, PSC, job demands and job resources makes on health and safety (Huck, 2008). This is determined by calculating Cohen's $f^2$ for each path in the PLS model. These paths included the hypothesized likings between PSC and health and safety, job demands and health and safety, and job resources and health and safety. The $f^2$ is computed by observing the change in $R^2$ and the adjusted $R^2$ when a specific construct such as job demands is eliminated from the model. But this elimination is done for with each latent variable linking to the endogenous

variable (health and safety). Two PLS path models were estimated, the first being the full model as specified by the research question (Figure 4) and its corresponding $R^2$ values ($R^2$ included) determined. The second was an identical model that eliminated one of the exogenous constructs such as job demands. This identical model may yield a reduce $R^2$ value called $R^2$ excluded (Hair et al., 2014a; Ringle, & Sarstedt, 2016).

The effect size of the omitted construct (job demands) for a particular endogenous construct (health and safety) was determined based on the $f^2$ values. The omission of exogenous latent construct was alternatively to determine the $f^2$ for each 'hypothesised' link between health and safety and the other PSC, job demands and job resources (Ringle et al., 2015). Therefore, if PSC, job demands, and job resources strongly contribute to explaining the variance of health and safety status of these fuel station attendants, the difference between $R^2$ included and $R^2$ excluded will be high or low, leading to a high or low $f^2$ value (Hair et al., 2014a; 2012; Ringle et al., 2012). Accordingly, the $f^2$ values, 0.02, 0.15, and 0.35 represent small, medium and large effects, respectively (Cohen, 1988).

**Research question six: To what extent do job resources and PSC mediate effect of job demands on worker health and safety of FSSAs in Accra, Ghana?**

Research question 6 examined the mediating effect of job resources and PSC on the effect of job demands on health and safety of the fuel station attendants (see Figures 4 and 5). The IV was the job demands with job resources and PSC as the mediator variables (MV) while health and safety serves as the DV. Mediation represents a situation in which a mediator variable (job resources) to some extent absorbs the effect of an exogenous latent construct (job demands) on an endogenous latent construct (health and safety) in the PLS path model (Hair

et al., 2014a). In other words, job resources and PSC variables were expected to account for the relation between the predictor variable (job demands) and health and safety, the criterion variable (Baron, & Kenny, 1986). Perhaps, job demands was as modeled exogenous latent variable in this model. In addition, job resources and PSC as MVs while health and safety, the DV, was modeled reflectively endogenous. Furthermore, all the latent variables were modeled reflectively (Hair et al., 2012; Hair et al., 2011; Ringle et al., 2012).

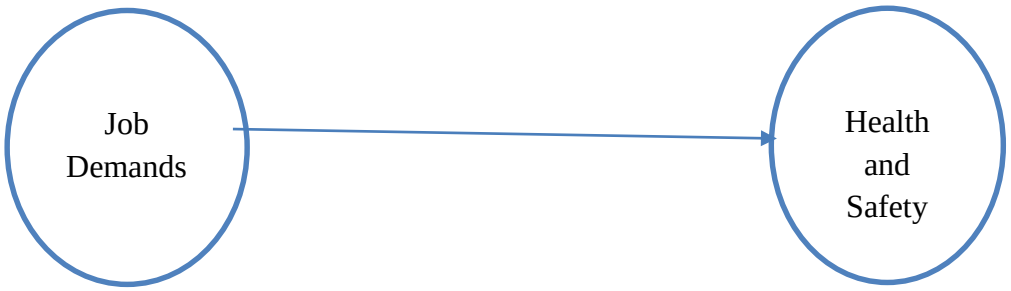


**Figure 4: The Relation of Job Demands on Health and Safety of FSSAs**

Mediating effect of job resources and PSC on the relation of job demands and health and safety was evaluated using PLS models Figures 4 and 5. The effect of the job demands was assessed by evaluating the path coefficients, direct and indirect paths and their effects in the two models. One involved the evaluation of the direct path which was job demands → health and safety. The second evaluation involved the indirect paths of job demands → job resources → health and safety, and that of job demands → PSC → health and safety. In addition, the path coefficient between the path job demands → health and safety and those of job demands → PSC, job demands → PSC, PSC → health and safety and job resources → health and safety were evaluated based on the coefficient ranges of +1 to -1. Coefficients of +1 or closer to +1 represents perfect or strong positive relationships and -1 indicates strong negative relationships between the job

demands and health and safety of the fuel station attendants. Therefore, the strength of the path coefficient depends on the magnitude of these values. Moreover, the path coefficient is significant if that value is higher than 1.96 (Hair, Sarstedt, Matthews, & Ringle, 2016).

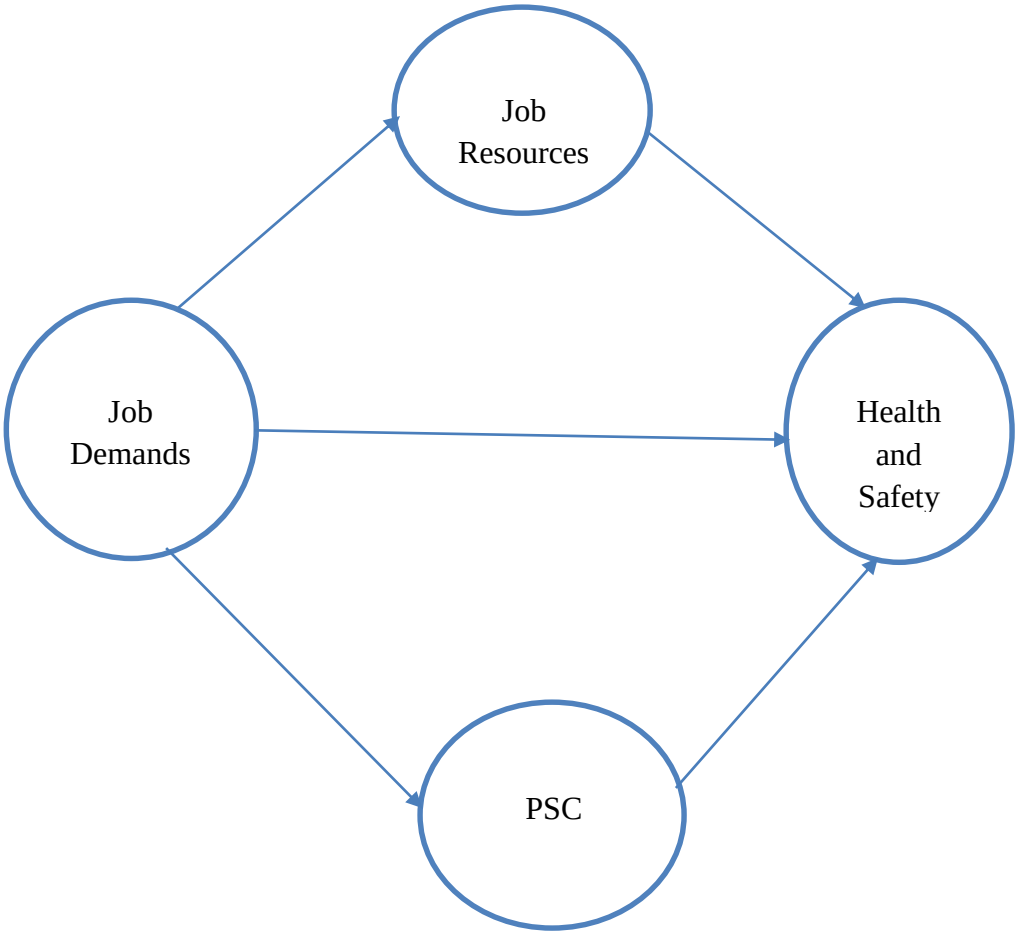


**Figure 5: The Mediating Effect of Job Resources and PSC on the Effect of Job Demands on Health and Safety of FSSAs**

The standard error was also obtained using bootstrapping to further test the significance of the path coefficient between job demands and health and safety of fuel station attendants. This was done with and without the mediating variables of job resources and PSC (Hair et al., 2014ab). A reduction in the path coefficient of the path job demands → health and safety in model figure 5 (direct effect), compared to that of model 4, indicated the mediating role of job resources and

PSC (Hair et al., 2012). But, in the first place, there must be a significant direct effect of job resources and PSC on health and safety in both models (Sushila et al., 2014). The significant direct effect in the complete model (figure 5) forms the basis for the assessment of the indirect effects. Similarly, the indirect effects must be significant (> 1.96 at 0.05) to adduce the argument for full or partial mediation role of job resources and PSC on the effect of job demands on health and safety of the fuel station attendants (Hair et al., 2014b; Wong, 2013).

Full mediation occurs when a significance direct effect of job demands on health and safety no longer exist in presence of job resources and PSC in the complete model (Figure 5). Besides, partial mediation occurs when job demands still has a significant direct effect, but this effect is reduced in the presence of job resources and PSC, as in the complete model in figure 5 (Baron, & Kenny, 1986). A full mediation reveals the MVs' (job resources and PSC) "total" influence on the effect of predictor variable or IV (job demands) on the criterion or IV (health and safety). However, a partial mediation demonstrates that there are multiple mediating factors or other variables are also responsible for reducing the effect of job demands on health and safety of these fuel station attendants (Chen, & Hung, 2016; Nitzl, Roldan, & Cepeda, 2016). Besides, the constructs' path coefficient values of the job demands → health and safety path disappears or diminishes in the complete model (Hair et al., 2014a; 2012; Ringle et al., 2012). But it is important to note that full mediation is normally impossible since several latent factors interralate to influence the outcome of another variable (Hayes, & Preacher, 2013; Hayes, & Scharkow, 2013).

Structural Equation Modeling (SEM) is a unique second generational statistical analytic tool (Hair et al., 2014b). SEM has been used in many social

science disciplines including organizational health research (Bakker, & Dollard, 2010), marketing, international marketing and strategic management (Hair et al., 2014a; 2012; Sarstedt, Ringle, Henseler, & Hair, 2014). It has been used in accounting (Lorraine, Stacie, Dutch, & Shani, 2011), aviation (Ringle et al., 2011), and tourism industries (Oom do Valle, & Assaker, 2015). Basically, it has two forms, the covariance-based SEM (CB-SEM) and the variance-based called Partial Least Squared Structural Equation Modeling (PLS-SEM). CB-SEM is relatively more popular and widely used in different disciplines (Hair et al., 2014a; Ringle et al., 2012). However, CB-SEM does not accept formative models (Garson, 2016). In addition, it is more of theory building than testing (Hair et al., 2011). Moreover, it has strict assumptions such as normal data distribution (Wong, 2013). In addition, it works with large data points or observations such as 200 or more (Hair et al., 2012).

This current research made use of PLS-SEM because it accepts both formative and reflective models (Hair et al., 2014ab; 2012; Henseler et al., 2015). Moreover, since the core aim of this study was to predict health and safety from the other constructs (PSC, job demands and job resources), PLS-SEM became the most appropriate tool. Furthermore, PLS uses a causal modeling approach analysis which aims at maximizing the explained variance in the DV (health and safety) in the model. Similarly, PLS does not also necessarily require a normally distributed data (Ringle et al., 2012). And since I cannot ascertain the quality of the data prior to its collection, PSL becomes the most preferred choice among the SEM families (Hair et al., 2011). One other strength of PLS is its ability to accept and analyse complex models such as those in the current research, in Figure 3 and 5 (Hair et al., 2011). Accordingly, PLS accepts complex measurements and

structural models (Rigdon, 2014). For example, both measurement indicators and their latent constructs can be modeled and analysed simultaneously (Hair et al., 2014a). This is more likely to lead to precise measurement and results upon which a valid conclusion can be drawn (Sushila et al., 2014).

# CHPATER FOUR

# RESULTS AND DISCUSSION

The purposes of this study were to: (1) explore the level of organisational PSC among the OMCs at the fuel service stations in Accra, (2) test the paths through which PSC predicts worker health and safety of the fuel station attendants, and (3) determine the extent to which job resources and PSC mediate the influence of job demands on health and safety of the fuel service station attendants in Accra. The study futher hypothesised the significant interaction effects between category of OMC and FSSAs on the perceived PSC levels and worker health and safety of attendants and that PSC, job demands and job resources would predict worker health and safety of FSSAs in Accra, Ghana. This chapter presents the results of the study and the discussions thereof. The results are presented in relation to the research question and the five hypotheses.

**Research Question One: What is the Level of PSC at OMCs and FSSs in Accra, Ghana**?

The level of PSC among the oil companies and their FSSs was determined by aggregating the PSC-12 items. The mean score was calculated based on the benchmark of Sobel (1982). These mean scores were then used to arrive at the level of organisational PSC in the companies. The results revealed an average PSC mean score of 36.08 among the OMCs. This is a low and high risk (39.99 or below) climate for the fuel station attendants. On the contrary, Total Oil and GOIL reported an average of high organisational PSC (41 or above), providing protective safety climate to their fuel station attendants. Specifically, the results

by company indicate that Total Oil has a mean score of 41.62, GOIL, 41.02, Allied Oil, 33.47 and Shell Ghana, 29.17. But Allied Oil and Shell Ghana scored low and thus, pose high health and safety risks to their fuel station attendants. Hence, there is a general high risk organisational PSC perception among FSSAs working in the OMCs in Accra. These fuel station attendants may be exposed to challenging work environments that risk the physical and psychological health and safety (Dollard et al., 2012ab; Dollard, & Neser, 2013).

Overall, the PSC finding revealed a general risk (36.08) of organisational safety climate to the health and safety of these fuel station attendants situated in Accra, Ghana. This level of PSC poses risks to health and safety of the attendants in this study (Dollard et al., 2012a). A possible reason for this high risk PSC level could be that the OMCs/FSSs or a vast majority of them, represented by their senior officers, do not adequately provide supportive PSC or measures that promote the safety climate of these companies (Dollard, & Bakker, 2010; Dollard et al., 2012bcd). Evidence strongly suggests that a high perceived organisational PSC is a buffer against deleterious impacts of daily job demands that may lead to injuries and ill health of workers (Garrick et al., 2014).

Organisational safety climate is an antecedent to improving the working conditions of worker (Idris et al., 2011; Abd Radzaz, & Bahari, 2013). Therefore, managers have to target worksite safety climate to provide for work environment that these attendants feel safe while doing their jobs (Kumako, & Asumeng, 2013). Improved working conditions of fuel stations may show first in the well written and appropriately displaced safety policy and working procedures at the fuel stations (Dwomoh et al., 2013). These policies and regulations form the basis of the work procedures (Shen et al., 2015) and direct the work and behaviour of

the attendants (Ansah, & Mintah, 2012). Furthermore, working conditions provide for adequate safety training and education, appropriate PPE, ensure safe housekeeping, while encouraging good interpersonal relation among fuel station attendants, and their management (Clarke, 2010; 2008). Improved organisational safety climate may reduce burnout and exhaustion among these workforce (Brough et al., 2014). Burnout and exhaustion are serious workplace factors that threaten health and safety (Lanciano, & Zammuner, 2014). Also, an improvement in worksite PSC could promote work engagement and increase in productivity at these stations (Geldenhuys et al, 2014). Hence, PSC at these fuel stations will be perceived highly and protective of health and safety if management practices are seen by the fuel station attendants to safeguard their well-being.

Perceived PSC level in this research is generally low, an indication of risk to health and safety of the fuel station attendants. Another plausible reason is that the level of senior management commitment and support for workplace stress prevention was low. In addition, the management may be given priority to increasing productivity or sales over that of the health and safety goals of these workers (Dollard, & Bakker, 2010; Dollard et al., 2011). Colley et al. (2013) support this assertion when they found that workers who perceived their management to have given emphasis to their well-being recorded more positive workplace PSC. Furthermore, their study indicated that at workplaces where management was perceived to have also promoted good human relations over productivity goals, the workers reported higher levels of safety climate perceptions. Colley et al. studied the perceptions of organisational values, safety climate and safety incidents among high risk Australian industrial workers.

Accordingly, their participants also reported fewer accidents, because of the perceived high values for the well-being of the workers.

A contrary finding by Colley et al. (2013) also showed that those workers who perceived their organisations to have placed much premium on formal processes, procedures and goal attainment reported lower levels of perceived safety climate and higher rate of safety incidents. Though they used a relatively small sample (368), Colley et al. surveyed predominantly adult ($M$ = 37.90) and males (82%) who included manual workers from industries such as mining, power/electrical, engineering/construction, rail, and aluminum smelting. This is an indication of male manual workers and their associated injuries and health challenges in these industries (Monney et al., 2015; Stańczak et al., 2014).

Furthermore, Oltedal and McArthur (2011) observed that the lack of attention to safety by senior personnel was responsible for inadequacies in the reporting of dangerous work among Norwegian-controlled merchant fleet. These authors reported that a trusting and open relationship among the crew, and safety oriented ship management culminated into higher reporting of incidents. On the contrary, the lack of attention to safety from shore personnel, are significantly related to lower reporting frequency. That is, senior management attitude to worksite safety does directly influence the safety behaviour of the workers (Clarke, 2010). This situation makes it difficult for the management to easily identify workplace hazards and to institute appropriate safety measures. In effect, the management of the OMCs and their outlets need to have open relationship with the fuel station attendants. Further attempt is vital to creating such open interactions among the fuel station attendants. This could promote prompt and

frequency of risks and accidents reporting which may result in taking of adequate proactive measures (Gorman et al., 2013).

The fuel station attendants in this current study would report high risk of PSC as about 70% ($n$ = 611), 25% ($n$ = 217) and 3% ($n$ = 30) of them work continuously for 24 or more hours and 12 hours, respectively. These long working schedules or hours can gravely compromise the health and safety of these fuel station attendants. And in such situation, they are more likely to have lower perception of their organisation's PSC (Bergh et al., 2013; Huang et al., 2007). Additionally, previous studies in Central and Western Regions (Ansah, & Mintah, 2012) and in Kumasi in the Ashanti Region, (Monney et al., 2015), all of Ghana, reported that over 80% of these fuel station attendants ran a 24-hour shift. Monney et al.'s finding indicated that these fuel station attendants suffer many illnesses including MSDs, headaches and low-back pains. Besides, Ansah and Mintah reported that the fuel station attendants were faced with insufficient provision of PPE. This reveals management's inadequacy in promoting fuel station attendants' health and safety. Therefore, in such a high risk safety climate fuel service stations, there is likely to be serious adverse effects on health and safety of these fuel station attendants.

Organisational PSC is also low in organisations with poor communication in relation to health and safety (Dollard et al., 2012cd). This position is also reasoned by Shen et al. (2015) that proactive involvement of workers in safety management is "conducive to forming a strong psychological safety climate" (p. 22). Such worker involvement in workplace safety matters is engineered by management communication, with the employees (Dollard et al., 2014). Moreover, good management safety communication may lead the fuel station

attendants to active participation in workplace safety discussions and performance (Lee et al., 2016). Cigularov et al. (2010) further stated that an effective safety communication is vital to engage workers in safety activities, to retain a positive culture, and to achieve support and cooperation among the various levels of the organisation. Accordingly, management has to put in place effective communication systems that identify and manage risks such as providing feedback to workers at these fuel outlets (Idris, & Dollard, 2011). A survey by Idris and Dollard among a cohort of Malaysian informal workers suggested that good safety communication promoted strong participation and involvement from all levels of the organisation in stress prevention. The opposite will be the case if such good communication system does not exist at fuel stations or if safety decisions are pushed top-down onto the fuel station attendants. At this point, low PSC will be recorded, thereby endangering health and safety of the fuel station attendants now and in the future.

Open organisational safety communication further leads workers to contribute immensely to demanding safety policy, safety training, setting safety goals, encouraging immediate accident reports, helping to conduct safety inspections, and prioritizing safety matters at meetings (Shen et al., 2015). On the contrary, one sided organisational safety communication may lead to the perception of discrimination. Discrimination is a significant and positive contributor to worker depression (Lee et al., 2016). For instance, a recent meta-analysis among Korean public workers established a strong association between depression symptoms and perceived discrimination among the workers (Son, & Kim, 2015). So if top-down management communication about safety exists and seen as discriminating against the fuel station attendants, their perception about

management caring for their health and safety perhaps would be low (Dollard et al., 2012a). Thus, good safety communication at the fuel outlets should aim not only at promoting and protecting the fuel station attendants but to also give them the capacity and voice. These should be enable them contribute effectively to their safety promotion and that of other persons who come in contact with their fuel stations. In the absence of these, the fuel station job would increase the risks to physical, psychological and social health and safety of the fuel station attendants. Management participation is also called upon in the face of this high risk PSC in the fuel stations (Dollard et al., 2011; Idris, & Dollard, 2011).

Perhaps, there is no or little participation including consultation among senior managers, fuel station attendants and their unions (if any exist) about health and safety issues of the fuel station attendants. In such a situation, fuel station attendants are more likely to have perceived their organisations to risk their health and (Hall et al., 2010; Dollard, & Bakker, 2010; Dollard et al., 2011). Management consults workers and their unions about their risks and needs to advert such risks. The consultation of that nature affords management insights into the needed safety measures to provide for the workers. Moreover, consultation provides the workers a sense of ownership of these measures that seek to protect and promote their health and safety (Idris et al., 2011). For instance, involvement of fuel station attendants and their supervisors in planning for fuel station security, provision of PPE, fire prevention strategies and healthcare provision will positively influence the safety behaviour that leads to increase perception of organisational PSC (Arcury et al., 2013). In the absence of this, safety perception will be low. The consequence of such low perception is that the workers may lose confidence in the management's ability to care for their

health and safety needs. This work environment breeds risky safety behaviours that reduces health, safety and well-being status of the fuel station attendants (Zohar, & Luria, 2010).

This finding is also evidenced in Clarke's (2010) meta-analytic path analysis where she tested a model linking perceived safety climate to organisational antecedents and individual outcomes. Her results demonstrated that perception of organisational measures such as the involvement of workers in safety issues was significantly associated with increased safety climate perception. Furthermore, though they concluded with their immigrant workers that safety climate was essential for providing workplace safety, Arcury and et al. (2013) found free provision of PPE to be associated with lower level of safety climate. However, this result was described as "counter-intuitive" (p.1). Thus, many other factors determine the level of safety climate perception among workers of all categories. Meanwhile, fuel station attendants in Accra would still report high risk PSC, posed by their fuel stations, to their health and safety. This is because the two previous studies (Ansah, & Mintah, 2012; Monney et al., 2015) revealed that very few aspect of safety such as training, guidelines on work and emergency procedures are given prominence in this industry in Ghana.

Fuel station attendants in this current study would perceive their companies to have a risky work climate. This may be as a result of the fact that station supervisors are not seen to provide adequately support for the health and safety of the fuel station attendants (Zohar, & Luria, 2010). Zohar and Luria provided evidence that supervisory leaders act as gatekeepers that direct work procedures and not to neglect health for customer service and productivity. In the fuel service industry, supervisors are better placed to inform their fuel station

attendants of the OMCs priorities (Ansah, & Mintah, 2012). This role of the supervisors results in a stronger relationship between the supervisors' influence on fuel station attendants' organisational safety climate perceptions (Kumako, & Asumeng, 2013). For example, a supervisor who often communicates about safety matters with the attendants helps enhance their individual safety climate perceptions. In this instance, the supervisor becomes a model, mentor and a friend to the fuel station attendants. Such supervisor-worker relation helps to promote PSC perception and reduce risk to health and safety among the fuel station attendants (Dollard et al., 2014).

Supervisors' concern is further demonstrated in daily interactions with fuel station attendants about safety matters. In such work environment safety behaviour of fuel station attendants is likely to be positive which contributes to their overall well-being (Shen et al., 2015). In specifics, Walker (2007) observed from South African construction industry that conducive organisational safety climate can be created by project managers, who are direct supervisors. Accordingly, where such conducive climate is created, workers perceive management team to prioritize their well-being over other issues like productivity. Besides, a study by Kouabenan et al. (2015) reiterated the supervisors' role in affecting safety climate perception. Their results among first-line managers showed that supervisors' encouragement was more influential on safety climate perception than that of senior management roles. Thus, where station supervisors create the congenial working atmosphere, fuel station attendants are more likely to perceive a favourable organisational safety climate (Lanciano, & Zammuner, 2014; Oxenstierna et al., 2008). This is because attendants' behaviour towards station safety is likely to be the one that protects

life and property (Clarke, 2010). In a similar vein, Gyekye and Salminen (2007) observed a close relationship between supervisor support and safety climate perception among a group of Ghanaian industrial workers. In the face of conducive organisational climate, there are probable high reported safety behaviours, less reported rate of death, injury and near misses, burnout, harassment, bullying and violence at the workplace (Azma et al., 2013; Okoye, & Aderibigbe, 2014). The absence of such climate is a perception of high risk of the fuel stations to the fuel station attendants.

The finding presupposes that the working conditions at some of the OMCs and their fuel stations pose risks to health and safety of the fuel service station attendants. These risks may include high exposure to petroleum fumes, costumer abuses resulting in physical and psychological stress, and other ill health conditions (Clarke, 2010; Monney et al., 2015). This poor safety climate could compromise, in the long term, the physical health and safety of the workers. These adverse health may manifest in MSDs, anxiety, depression, reproductive defects, loss of concentration, hypertension, cancer and even death (Attfield et al., 2012). Furthermore, evident indicates that low organisational safety climate has adverse effects on the health and safety of the family members of the worker (Dollard et al., 2012a). In the fuel station industry, the household members especially children and pregnant women are at higher risk of the effects of the exposure to fumes if these fuel station attendants continue to carry the work cloths home unwashed. Whereas the male fuel station attendants can have problems with reproduction including low and defective sperms as the results of the exposures to the fumes (Moline et al., 2000), pregnant mothers may be anemic and experience miscarriage (Crain et al., 2008). Additionally, children may be petro-

chemically intoxicated resulting in anemia, bone and cardiovascular defects (Walter, & Moller, 2014). Besides, the long working hours can also be a source of family conflict. Such conflicts could lead to both psycho-emotional and physical abuses and their complicated health, economic and social consequences (Dollard, & Neser, 2013).

The perceived risk posed by the companies and their stations to the attendants reveals practically that there are further inadequacies in the management participation via consultation with the workers, and their unions in the issues of station health and safety of the fuel station attendants. Perhaps, the managers further failed to train these fuel station attendants adequately on the issues of the health and safety both at work and at home. Moreover, the safety behaviours of these fuel station attendants may be very low (Ansah, & Mintah, 2012). Moreover, majority of them are suffering from various ill health conditions (Monney et al., 2015) that management need to pay more attention (Dollard et al., 2011; Idris, & Dollard, 2011). Thus, promoting PSC is a contemporary ways of conducting modern business and will advance the health, safety and well-being of the fuel station attendants (Dollard et al., 2014; 2012b).

Perhaps, the OMCs and their fuel stations are losing economically as a result of the perceive risks their outlets pose to health and safety of the fuel station attendants. The companies are losing economic values as a results of absenteeism and presenteeism, healthcare costs, and may be to some extent, compensation claims (Veltri et al., 2007). In the case of total withdrawal from work by an attendant, the companies would have to employ and train new fuel station attendant. These probably are inexperienced fuel station attendants who may be more proned to mistakes and injuries (WorkSafety Saskatchewan, 2015). This

brings higher costs and tarnishes the corporate reputation of the OMCs and the fuel service stations (Chau et al., 2008; McTernan et al., 2013). The situation further limits the OMCs' and their fuel stations' ability to boost the morale of fuel station attendants. It may further reduces the ability to foster innovation, promote productivity and give competitive advantage to their companies (Colley et al., 2013).

Fuel station attendants are relatively young men and women (Ansah, & Mintah, 2012; Monney et al., 2015; Olaotse, 2010). The compromised health and safety of these fuel station attendants does not only adversely affect them, but also affect the socio-economic indices of their families and the healthcare system. The family pays the brunt through chronic ill health and death of their members (attendants), disability and healthcare cost (Dollard et al., 2012a). Moreover, the healthcare system of Ghana would be burdened with high numbers of patients with various illnesses. Besides the direct economic costs to the healthcare provision by the ill health of these fuel station attendants, the large numbers may stress the health professionals, logistical and equipment provisions at the various healthcare systems. Not many health facilities in Ghana have OHS units and professionals (Annan, 2011; Annang, 2014). This means the healthcare system would have difficulty in dealing with such work-related illnesses. The result is a complicated health of these fuel station attendants (Dollard, & Neser, 2013). Therefore, there would be a need to establish facilities and train professionals to care for such work-related injuries and diseases. OHS issues could not be appropriately addressed without an effective national healthcare system and regulations (Harvard Business Review, 2013), which Ghana is yet to establish one (Clarke, 2010).

The high risk to health and safety perceived by fuel station attendants (in the current study) calls for the formulation and/or implementation of both national and company OHS policies. The OHS of workers cannot be assured without promulgation of such safety policies and regulations and their effective implementations (Clarke, 2010). Activation of the existing national fragmented OHS regulations is apparent in this situation and empowering Factory Inspectorate division of the Ministry Labour and Employment becomes necessary (Annan, 2011). Besides, a comprehensive national OHS policy and regulations, and establishment of an independent, well-equipped regulatory institution are long overdue (Annang, 2014; WHO, 2007). At the company or organisational level, simple workable policies and regulations are inevitable for the well-being of the fuel station attendants (Boustras, & Hadjimanolis, 2012; Songstad et al., 2012).

**Research Question Two: What Differences in PSC Exist among Departments of FSSAs in Accra, Ghana?**

One-way ANOVA was calculated to determine the difference in the PSC levels according to the departments of FSSAs. The results of the One-Way ANOVA revealed a statistical significant difference among various departments among the fuel station attendants by the way they perceived their organisations' PSC levels [$F$ (2, 873) = 3.29, $p$ = .037, $\eta^2_p$ = 0.01]. However, with 0.01, the magnitude of the practical difference of perceived organisational PSC levels was small (Huck, 2008). This is an indication that though forecourt and lube bay fuel service attendants have difference PSC perceptions, practically this difference is negligible (Cohen, 1988). As shown in Table 2, the Bonferroni follow up test indicated that fuel station attendants at the lube bay ($M$ = 37.61, $SD$ = 13.20)

reported higher levels (moderate) of organisational PSC perception than those at the forecourt who reported risky perception ($M$ = 34.98, $SD$ = 12.47). However, no further statistical difference existed among the other departments of the fuel station attendants. Hence, FSSAs by departments differed on their OMCs' PSC levels, and that forecourt fuel service station attendants perceived riskier psychosocial work environment compared with their counterparts at the lube bay.

**Table 2: One-Way ANOVA Results Showing the Differences in Perceived PSC Level According to the Departments of FSSAs**

| Groups | *n* | *M* | *SD* | *df* | *F* | *Sig.* | $\eta^2_p$ |
|---|---|---|---|---|---|---|---|
| | | | | 2, 872 | 3.29 | 0.04 | .01 |
| Lube Bay Att. | 205 | 37.61***** | 13.20 | | | | |
| Forecourt Att. | 426 | 34.98***** | 12.47 | | | | |
| Shop Att. | 245 | 36.71 | 13.21 | | | | |

***p* < 0.05; High Risk PSC = ≤ 36.99; Moderate = 37.0 – 40.99; Low = ≥ 41**

The finding revealed that fuel station attendants by departments differ on their OMCs' PSC levels. Specifically, forecourt service attendants perceived high risk psychosocial service stations compared with their counterparts at the lube bay. Furthermore, fuel service attendants at the forecourt perceived their stations to pose riskier PSC as compared with their counterparts at the lube bay. While fuel station attendants at the lube bay perceived moderate risk of PSC ($n$ = 205, $M$ = 37.61, $SD$ = 13.20), those at the forecourt reported high risk PSC perception ($n$ = 426, $M$ = 34.98, $SD$ = 12.74). Though fuel service attendants working in the shops recorded high risk PSC perception, this did not differ markedly from that of other fuel station attendants. These differences could be as a result of the differences in the shift systems these fuel station attendants run (Olastese, 2010),

variations in their jobs, differences in age and maturity (Okoye, & Aderibigbe, 2014), their educational and skills levels (Ansah, & Mintah, 2012).

Although, a vast majority of shop service attendants run similar shift, are also of the same skill levels, age and education bracket as those at the forecourts (Ansah, & Mintah, 2012). Besides, shop workers are mostly females who are most likely to see their jobs as dignifying and more satisfactory since they work in congenial physical environment (Gyekye, & Salminen, 2007). Moreover, shop attendants may be working under less pressure and deal with more friendly customers (Olaotse, 2010). These workers also work in safer environments that usually include well roofed, air-conditioned, less polluted setting and may have opportunity of sitting down (Monney et al., 2015). These conditions could lead to the demonstration of better safety behaviours and protection of well-being (Clarke, 2010). Moreover, with such positive safety behaviours, shop workers are more likely to have average workplace safety climate perception. This is because they may demonstrate high safety behaviours through adequate practices safety procedures that reveals in few accidents occurrence (Wachter, & Yorio, 2014).

Although, the shop attendants in the current study also reported risky (36.71) fuel service station PSC, their level of compliance to safety work practices may be positive. Evidence further suggests that female shop workers are the best compliant to safety procedures and thus have demonstrate higher safety behaviours (Comlan et al., 2009). Accordingly, because they also express the highest level of job satisfaction and record the lowest accident frequency, such workers indicate the best perceptions on organisational safety climate (Wachter, & Yorio, 2014). Comlan et al's. support this current result as their Gabonese

industrial workers study revealed various high rates of injuries. However, the female shop retailed workers in Comlan et al.'s study recorded fewer incidences.

The marked difference between the forecourt and lube bay fuel station attendants on their PSC perception could as a result of the vast variations in their working schedules. Fuel station attendants in this study work in shifts ranging from eight hour per day to 24 hours or more days. Earlier articles from Ghana have also reported similar shift systems (Ansah, & Mintah, 2012; Monney et al., 2015). It is evidenced in these earlier studies that while the mechanics run 12 hour shift, a typical forecourt fuel station attendant works 24 hours, or three or more days. This long working hours, through the night, exposes this category of pump attendants to various forms of hazards. Some of these fuel station hazards include armed robbery and fire outbreak (Olaotse, 2010). The variations in the working schedules and their effects on the fuel station attendants account for the differences in the levels of organisation PSC perceptions. Night shift fuel station attendants may further be deprived of adequate and quality sleep leading to high amount of confusing, low concentration, headache, nervousness, anxiety and increased accident occurrence (Addisu, 2011; Huang et at., 2007; Occupational Safety and Health Administration, 2009). The argument is that, workers who are more exposed to adverse working environment are likely to perceive such work setting to pose risk to their health and safety (Körner et al., 2015).

Work arrangement is evidently linked to high rate of accidents and poor workplace safety behaviours (Okoye, & Aderibigbe, 2014). Okoye and Aderibigbe attributed the vast difference in injury rates among their Nigerian construction industry participants to their varied shift systems. Further, they observed that permanent workers had higher safer behaviours and fewer injuries

than casual workers who also work more hours both day and night. It is observed that forecourt attendants are more of casual workers compared to lube bays ones (Olaotse, 2010). Thus, safety is questioned or becomes a problem at night especially when workers work long hours before and through the night (Rotenberg et al., 2008), as in the case of pump attendants (Monney et al., 2015). A research article by Shahriari and Kines (2013) indicated a compromised workplace safety that has been blamed on night shift. Many worksite accidents, such as Three Mile Island, Chernobyl and Exxon Valdez, have major antecedents of which working at night is one (Huang et al., 2007). The 3rd June, 2015 "twin disaster" in Accra which killed all the fuel station attendants present at the fuel station occurred at night (Ghana News Agency, 2015). Probably, all these fuel station attendants were from the forecourt and the shop since those at lube bay might have closed and gone home. These experiences coupled with the job stress pose risky work climate more to the fuel station attendants working at the forecourts.

Evidence further shows that those working through the night experience dangerous situations including accidents (Ansah, & Mintah, 2012; Monney et al., 2015; Wu et al., 2007). Though, these studies made use of fewer samples from Central and Western Regions (116) and from Kumasi (145), they both revealed that fuel station pump attendants are the most victims of fuel outlet disasters. Fuel station armed robbery in South Africa (Olaotse, 2010) and Ghana (Ahmed et al., 2010) occurred at night and that also killed and/or injured many fuel station pump attendants. Therefore, safety climate perception for this category of fuel station attendants would vastly differ from that of the lube bay who work predominantly during the day. Hence, fuel station attendants working at the forecourts would

perceive their fuel stations to be exposing them more to higher health and safety risks as compared to the other workers.

Fuel station attendants also have varied jobs systems (Monney et al., 2015). At the lube bay, the mechanics work under relatively relaxed conditions while repairing vehicles, protected by a shelter. In addition, they have confined work space that limits their movement, and have fewer customers at a time that may wait patiently as their vehicles are being repaired (Abu et al., 2015). Contrarily, fuel station attendants at the forecourt stand for long hours during work and carry heavy loads such as underground tank covers, and during offloading engine oil. They mostly work under pressure serving customers who sometimes physically and verbally abuse this category of fuel station attendants (Ansah, & Mintah, 2012; Clarke, 2010). Other customers may escape without paying for the services provided (Olaotse, 2010).

Relatively, fuel station pump attendants work under several health threatening conditions including working without the use of nose guards, and under the sun, in the rain, as many of the outlets may not supply and enforce the use of rain coat. Thses situations expose the fuel station forecourt attendants to adverse weather conditions (Santiago et al., 2014). In addition, the job demands at the fuel station forecourts involves pump attendants refueling motor vehicles, cleaning vehicle windscreen, topping up brake fluid and engine oil (Monney et al., 2015). The unfaviourable job schedules, the forecourt environment, the job demands and the kind of customers relatively threaten the health, safety and the general well-being of these fuel station pump attendants (Winwood et al., 2013).

Job demand is inversely related to work outcomes and worker health (Masia, & Pienaar, 2011). Fuel station pump attendants are probably the most

affected with workload (Ansah, & Mintah, 2012). A meta-analytic review informed that workload is negatively associated with psychological and physical well-being (Bowling et al., 2015). Moreover, various health conditions are reported among pump attendants. They include vision impairment, osteoarticular, cardiovascular and respiratory tract diseases (Monney et al., 2015; Okoye, & Aderibigbe, 2014). Osteoarticular diseases are attributable to the long period of standing and physical labour (Santiago et al., 2014), an indication of a risky climate to health and safety (Dollard, & McTernan, 2011; Lanciano, & Zammuner, 2014).

Perhaps, the forecourt attendants are further having challenges with high job stress from job dissatisfaction and emotional exhaustion (Gyekye, & Salminen, 2007; Monney et al., 2015). In such a case, they are more likely to have riskier organisational PSC compared with those working at the lube bays. In support this assertion, a cross-sectional study by Masia, and Pienaar (2011) among South African mine workers revealed that work stress had a negative relationship with safety and safety perception. According to the results from these convenient sampled workers, job satisfaction was a significant predictor of safety perception. In addition, the level of job satisfaction further influenced the rate of reporting worsened emotional exhaustion among the workers. That is, workers reporting higher job dissatisfaction are also highly likely to record higher rate of emotional exhaustion (Seidler et al., 2014). A similar result (Nel et al., 2015) showed job satisfaction's influence on employees' life and safety. Though, this current study has not reported job satisfaction of the fuel station attendants, according to their job descriptions and workload, forecourt attendants are more disadvantaged. That is, forecourt attendants' work demands involve standing for

long hours, working and moving very fast especially during morning and evening (rush hours) and serving different kind of customers (Ansah, & Mintah, 2012). It is possible such workers have more stress including physical and emotional exhaustion than other fuel station attendants (Hall et al., 2013; McTernan et al., 2013).

Furthermore, a study by Stoilkovska et al. (2015) demonstrates that job satisfaction has a strong effect on perceived management commitment to work safety, one component of PSC (Dollard et al., 2012ab; Dollard & Bakker, 2010). Among their construction workers, Stoilkovska et al. concluded that in the presence of job satisfaction, there would be lower percentage of accidents and injuries in the workplace and better health among employees. That is, workers who report job dissatisfaction also report corresponding unhealthy safety behaviours that influence their injury and illness rates (Gilbreath, & Karimi, 2012; Lanciano, & Zammuner, 2014). A similar finding revealed among randomly selected Australian casual workers that physical job demands were related to frequently reported MSDs, which in-turn predicted workers' compensation claims as a result of injuries, illnesses and deaths (Bailey et al., 2015b). This calls the management to promoting safety practices that seek to increase the safety protection of the fuel station attendants and raises PSC of the fuel stations (Ansah, & Mintah, 2012).

**Research Question Three: What Differences Exist in Health and Safety Status of FSSAs from Different OMCs in Accra, Ghana?**

One-Way ANOVA was estimated to determine whether the health and safety status of FSSAs differed according to the OMC they worked for. The One-Way ANOVA results showed a statistical significant differences among the fuel

station attendants according to their OMCs, [$F$ (3, 872), 6.14, $p$ = 0.01, $\eta^2_p$ = 0.02]. With 0.02, a small magnitude of practical difference (Huck, 2008) in health and safety status existed among the fuel station according to their OMCs. This provides evidence that there is a small difference existing in health and safety status of the fuel station attendants working for Allied Oil, GOIL, Shell and Total Oil companies (Cohen, 1988). Furthermore, as shown in Table 3, the Bonfferoni multiple comparison results indicated that Shell fuel station attendants ($M$ = 18.15, $SD$ = 5.77) significantly poorer health and safety status than those from Allied Oil ($M$ = 19.79, $SD$ = 5.81), GOIL ($M$ = 20.36, $SD$ = 5.97), and Total Oil ($M$ = 20.34, $SD$ = 5.57). However, no further statistical significant differences were found in health and safety state of the fuel station attendants according the OMCs for which they work. Therefore, fuel station attendants have differences in their health and safety status according to the OMCs they work for, but those working with Shell had marked poorer status compared with those from other OMCs.

**Table 3: One-Way ANOVA Results Showing the Differences in Health and Safety Status of FSSAs According to their OMCs**

| Groups | *n* | *M* | *SD* | *df* | *F* | *Sig.* | $\eta^2_p$ |
|---|---|---|---|---|---|---|---|
| | | | | 3, 873 | 6.14 | 0.01 | 0.02 |
| Allied | 297 | 19.79***** | 5.81 | | | | |
| GOIL | 172 | 20.36 **º** | 5.97 | | | | |
| Shell | 187 | 18.15***ºª** | 5.77 | | | | |
| Total | 220 | 20.34 **ª** | 5.57 | | | | |

***ºª**$p < 0.05$

Health and safety status of every workers is crucial to the worker, the family, the company, and the whole society (Gahan et al., 2014). The finding generally showed that fuel station attendants working for Allied Oil, GOIL, Shell and Total Oil companies had significant differences in their health and safety status. Inter-company difference indicated that fuel station attendants working for Shell had much worse health and safety status than those at Allied Oil, GOIL and Total Oil companies. This is an indication that PSC of the Shell and its fuel outlets is perhaps worse than in the other companies. Thus, in the face of long working hours that involves standing, Shell attendants have more physical, social and emotional health problems than attendants from the other companies. These ill health conditions are manifesting through bodily pains, injuries, and personal or emotional problems that limit their level of energy, work and house activities, and their ability to socialize with families and friends (Villalobos et al., 2013; Ware et al., 2001). This difference in health status may be dangerous to Shell attendants. Probably, their company and its station managers are more interested in customer services and increasing daily sales than the typical health of the attendants (Dollard et al., 2012c).

Again, such reported poorer health status among Shell fuel station attendants may result from the lack of or inadequate implementation of station safety policy, provision of PPE, safety training and education and safety facilities (Rickie, & Sieber, 2010; Shen et al., 2015), that largely reflect the PSC of the companies (Bailey et al., 2015ab). Lack of or the inadequacy of these safety measures at worksite is an antecedent to the occurrence of near misses, injuries, illnesses and even deaths (Ana, & Sridhar, 2009; Galizzi, & Tempesti, 2015). For example, as observed in the previous health and safety articles from Ghana

(Ansah & Mintah, 2012; Monney et al., 2015), the current study also reported that 31% (*n* = 267) of the fuel station attendants experienced regular customer abuses while 23% (*n* = 198) had various degrees of injury. Besides, 13% (*n* = 112) are reported as having vehicular accidents, 9.5% (*n* = 83) fire outbreaks and 4% (*n* = 37) experiencing armed robbery.

Though, not directly reported in this current study, the fuel station attendants in Shell are likely to report high level of MSDs. This in part may be attributed to long hours of standing coupled with lack of or less attention given to safety training (Monney et al., 2015). For example, in the current study, some items assessed directly physical health of the participants, "how much bodily pain have you had during the past 4 weeks?" The responses to this item indicated that 10.5% of the fuel station attendants "not at all" had a body pain, 20% had "a little bit", 23% had "some", 24% had "quite a lot" while 23% "could not do daily work". Another item which asked about physical health, "during the past 4 weeks, how much did bodily injury prevent you from working normally?", also revealed that 6% had "none", 23% had "very mild", 38% had "mild", 19% had "severe" with 14.3% reporting "very severe" body injury.

A careful analysis of responses to these items revealed that about 70% of the fuel station attendants had some amount of body pain and to the point they could carry out their daily work. Moreover, a total of 72% of the participants reported very mild to very severe body injury and that interfered with their daily work. Therefore, it is appropriate to imply that these Shell fuel station attendants' significant poorer health and safety status is implicated by their physical health status that included bodily pain and injuries. Furthermore, Shell fuel station attendants might be having much problems with their social activities including

having quality time with families and friends. Besides, they are faced with higher emotional problems that cause increased absenteeism and presenteeism, as indicated from item analysis. These physical and emotional health challenges affect many facets of the life of these workers. Evidence revealed that workers with such physical adverse health conditions predominantly lack the enthusiasm and the ability to enjoy both family and social life (Seidler et al. 2014). The reduced family-social interaction further complicates the health of such employees (Gilbreath, & Karimi, 2012). That is, Shell fuel station attendants might be having significant problems with their family and social interaction because of their compromised health. Personal and emotional life and well-being of these fuel station attendants are likely to be complicated. The management of Shell and their fuel service stations managers have urgent duty to provide measures including safety facilities to protect these fuel station attendants.

The relative significantly poorer reported health status among Shell fuel station attendants presupposes that they are exposed to more workplace hazards such as job insecurity, low job satisfaction, and compromise workplace social support. The consequence is higher amount of work stress and reduced health and well-being (Brough et al., 2014). This also means that this group of attendants have higher injury, bodily pains that are affecting their personal, emotional and psychological health. Such deteriorating health predisposes these Shell attendants to chronic illnesses including MSDs such as low back pain and arthritis. Others include anxiety, depression, hypertension, cardiorespiratory diseases and cancers (Lanciano, & Zammuner, 2014; Son, & Kim, 2015). The health and safety of this group of the attendants would continue to be much poorer if proper practical measures are provided by the Shell management at their fuel outlets. Moreover,

these measures have to also influence the safety behaviours of the fuel station attendants to yield their health and safety protective purposes. Thus, there is likelihood of work absence and/or less productivity without properly promoting the health and safety of these fuel station attendants (Dollard et al., 2012ac; Kaynak et al., 2016).

Presenteeism, absenteeism, reduced productivity (Hafner et al., 2015; Kaynak et al., 2016) are some manifestations of the adverse health condition of a typical worker. Absenteeism and presenteeism are two key factors that may reduce the daily sales of the fuel outlets and increase the cost of running the stations. Cost is involved in training new attendants who are also prone to station accidents (WorkSafety Saskatchewan, 2015). Furthermore, increased medical bills and compensation claims are also likely to occur that may negatively affect the morale of Shell fuel station attendants (Nel et al., 2015). Shell and its fuel service stations may also be facing increased supervision and sanctions from the regulatory authorities like Department of Factory Inspectorate of the Ministry Labour and Employment (Annan, 2011) for probable higher worker injury and illness. These situations could reduce the corporate image of Shell's company both nationally and internationally and reduce its market share. The fuel station attendants are the first valuable resource of every OMC (Clarke, 2010).

Bad health conditions do not put strains on only the worker and their families, healthcare and health and safety services are equally affected (Okoye, & Aderibigbe, 2014). The results are increased healthcare for fuel station attendant and presenting of new and complicated cases. This calls for new health and safety strategies including policies, regulation and services to save the lives of attendants. Because of the non-existing designated health facilities and health

and safety specialists, the traditional healthcare system would have to bear the brunt of caring for such workers (Annang, 2014). In addition, the down-ward turn of health condition of these segment of fuel station attendants increases the pressure on the Ghanaian healthcare system and its professionals. Thus, the health and safety of workers such as fuel station attendants affects the general personal, emotional and social health of each society. Issues of workers' health are paramount and every individual, organisational and national effort should be garnered towards preserving it. Therefore, improving the health, safety and well-being of these workers can have real personal, societal and economic benefits. Addressing health and safety among the fuel station attendants in Shell and other OMCs, with the organisation of more effective health promoting programmes, may lead to overall job and life satisfaction. Furthermore, it would reduce the costs of healthcare utilisation and compensation claims and increase productivity to the OMCs (Hafner et al., 2015).

**Research Question Four: What Interaction Effects Exist among Categories of OMCs and Different FSSAs on PSC Levels and Worker Health and Safety of Attendants in Accra, Ghana?**

A two-by-two factorial MANOVA was conducted to test the effect of OMCs and FSSAs categories on the combined effect of organisational PSC and health and safety state of the attendants. Data screening using *Q-Q* and Box plots reveals no missing values, and no multivariate outliers. Besides, significant test statistics of Kolmogorov-Smirnov and Shapiro-Wilk show a non-normal data. The test of homogeneity of the DVs could not also be concluded, Box's *M* (81.26), $p = 0.01 < 0.01$, is significant. Levene's test of equality of error variance (2.83, $p = 0.01$) is significant for health and safety but not for PSC (1.29, $p = 0.22$). Therefore, Pillai's Trace statistic was the appropriate to choose and report.

The MANOVA results revealed a statistical significant interaction effect between OMCs and FSSAs categories on the combine effect of the DVs, organisational PSC and health and safety state of the fuel station attendants, $F$ (11, 864) = 2.68, $p$ = 0.001, Pillai's Trace = 0.04, partial $\eta^2_p$ = 0.02. The follow-up univariate effect is also significant $F$ (11, 864) = 7.11, $p$ = 0.01, Pillai's Trace = 0.94, partial $\eta^2_p$ = 0.94. But this difference exists only among the OMCs, $F$ (6, 869) = 25.44, $p$ = 0.01, Pillai's Trace = 0.16, partial $\eta^2_p$ = 0.08, and not the attendants' category $F$ (6, 869) = 1.25, $p$ = 0.28, Pillai's Trace = 0.01, partial $\eta^2_p$ = 0.03 (see Table 4).

**Table 4: Multivariate Effect of Categories OMCs and FSSAs on their PSC Levels and Health and Safety of Attendants**

| Variable | *df* | *F* | *Sig.* | $\eta 2_p$ |
|---|---|---|---|---|
| OMCs*FSSAs | | | | |
| Health and Safety | 6 | 1.84 | 0.09 | 0.01 |
| PSC | 6 | 3.12 | 0.01 | 0.02 |
| Corrected Model | | | | |
| Health and Safety | 11 | 2.95 | 0.01 | 0.04 |
| PSC | 11 | 16.02 | 0.01 | 0.17 |
| OMCs | | | | |
| Health and Safety | 3 | 4.43 | 0.01 | 0.02 |
| PSC | 3 | 53.28 | 0.01 | 0.16 |
| FSSAs | | | | |
| Health and Safety | 2 | 1.60 | 0.20 | 0.01 |
| PSC | 2 | 0.90 | 0.406 | 0.002 |

Therefore, the category of FSSAs, the OMCs and the combination of the two creates significant differences in the organisational PSC and health and safety status of the fuel station attendants. The data and model support the expectation that category of companies and their worker groups (FSSAs) interact significantly to create both multivariate and univariate differences in organisational PSC and health and safety status of these fuel station attendants.

Furthermore, the univariate analysis revealed that only the OMCs (by their attendants) differ on their health and safety and perception of organisational PSC, $F$ (11, 864) = 25.436, $p$ = 0.01, Pillai's Trace = 0.16, partial $\eta^2_p$ = 0.08. However, FSSAs present no univariate significant difference on their health and safety and organisational PSC, $F$ (11, 864) = 1.25, $p$ = 0.29, Pillai's Trace = 0.01, partial $\eta^2_p$ = 0.01. Additionally, the Bonferroni post hoc test showed that Total Oil attendants have better health and safety status than those working with Shell Ghana. Besides, GOIL fuel station attendants reported better health and safety status than their counterparts from Shell Ghana. On the other hand, Allied Oil fuel attendants were not different from any of the companies on their health and safety. Similarly, marked differences exist between Total Oil and GOIL on their organisational PSC. However, fuel station attendants from Allied Oil report higher perceived organisational PSC than those in Shell. Furthermore, GOIL fuel station attendants rated their company's PSC higher than those working with Shell Ghana and Allied Oil. There is also a higher perception of organisational PSC among Total Oil attendants compared with those from Shell Ghana and Allied Oil (see Table 5). Therefore, there are significant differences among the OMCs in terms of their fuel station attendants' health and safety status and organisational PSC levels.

**Table 5: Univariate Difference in Health and Safety and PSC by OMCs and their FSSAs**

| Items | *n* | *M* | *SD* |
|---|---|---|---|
| **OMCs** | | | |
| **Health and Safety** | | | |
| Allied | 297 | 19.79 | 5.82 |
| GOIL | 172 | 20.36^ | 5.97 |
| Shell Ghana | 187 | 18.15*^ | 5.77 |
| Total Oil | 220 | 20.34* | 5.57 |
| **PSC** | | | |
| Allied | 297 | 33.47#*& | 12.22 |
| GOIL | 172 | 41.02^& | 11.56 |
| Shell Ghana | 187 | 29.17$^# | 11.83 |
| Total Oil | 220 | 41.62$* | 11.76 |
| **FSSAs** | | | |
| **Health and Safety** | | | |
| Forecourt Att. | 426 | 19.72 | 5.51 |
| Shop Att. | 245 | 19.26 | 5.80 |
| Lube bay Att. | 205 | 20.16 | 6.45 |
| **PSC** | | | |
| Forecourt Att. | 426 | 34.98 | 12.47 |
| Shop Att. | 245 | 36.71 | 13.21 |
| Lube bay Att. | 205 | 37.61 | 13.20 |

**PSC: Psychosocial Safety Climate, FSSAs: Fuel Service Station Attendants, *n*: Sample, *M*: Mean, *SD*: Standard Deviation**

The findings here revealed that the category of FSSAs, the type of OMCs and their combined interaction resulted in creating significant multivariate and

univariate differences in organisational PSC, and health and safety status of the fuel station attendants. Besides, large magnitude (0.17) of practical differences (Huck, 2008) existed among the OMCs on levels of their organisational PSC. However, at univariate level, only the categories of OMCs, and not FSSAs, differ significantly on both organisational PSC and health and safety of these fuel station attendants. In other words, the findings showed that the OMCs and their fuel station attendants are together the actors of companies' PSC and the health and safety of the same workers.

It is not surprising to find out that the OMCs and station managers are the most important agents in creating positive fuel station safety climate (PSC) that also promotes health and safety of the employees (Avram et al., 2015; Idris et al., 2012). Besides, it is the fuel station attendants who put into effect these policies, workplace procedures and practices to the benefit of the whole organisation (Dollard, & McTernan, 2011).

The organisations (OMCs) and their employees are combined architects of the companies' safety climate such as PSC (Dollard et al., 2014). PSC is a subset of the general organisational climate that depicts "this is what we do and how we do it here" of a company (Idris et al., 2012). The aim of PSC is to advance the health, safety and well-being of every worker (Garrick et al., 2014). At the fuel outlets, PSC should be perceived and experienced by every fuel station attendant both consciously and/or unconsciously on a continual basis (Winwood et al., 2015). Then, these fuel station attendants become the practical beneficiaries of the effects of workplace policies, procedures and practices that emerge as a result of positive organisational PSC (Cantley et al., 2015). In this case, the health, safety and well-being of the fuel station attendants are largely dependent

on the climate created by the OMCs and their stations (Bergh et al., 2013; Stańczak et al., 2014).

Experience in relation to fuel station PSC depends on whether it offsets the otherwise unavoidable demands of the work or not. But where senior OMC and station management overlook PSC, the fuel station job demands create uncontrolled, negative and disturbing experiences for the workers. Conversely, where senior management is mindful to check and carefully maintain it, a very high positive climate results. In such a climate, each fuel station attendant feels safe and protected. They may also feel treasured and that their efforts and achievements are noticed and appreciated by management. Among such OMCs and stations, attendants are more likely to feel they are privileged to work in there. Besides, such fuel station attendants have high degree to desire to remain there, and engage in reciprocal positive workplace behaviour (Thomas, & Rose, 2010). The findings of Becher et al. (2016) and Winwood et al. (2015) suggest that the differences among various organisations in relation to the health of their workers and their perceptions about workplace PSC hinge on senior management's acts towards safety climate. Perhaps, PSC and health of the attendants are more likely to be evaluated high at OMCs and fuel stations where senior management, such as marketing officers, sale officers, station managers and supervisors pay much more attention to the health and safety issues (Iavicoli et al., 2014).

Furthermore, it is important to identify that workers, for that matter the fuel station attendants, are equally critical in promoting and maintaining high positive PSC at their stations (Cantley et al., 2015). The argument is that work policies, procedures and practices do not operate in a vacuum. They can only be carried out through the workers, so that health and safety benefits (Thomas, &

Rose, 2010). For example, in two case studies that explored the PSC at preschool, Zinsser and Zinsser (2016) observed that school policies and laid down procedures and other related practices could never be realized without the conscious efforts from the teachers. In a similar study among Vietnamese public workers, Nguyen et al. (2017) found large discrepancies in PSC at various workplaces. More importantly, Nguyen et al. resolved that in all cases, PSC became more protective of the health of the workers where they embraced safety measures. Therefore, no matter the level of the organisational PSC of the OMCs and their fuel outlets, the fuel station attendants would have to practically effect the policies, follow judiciously station produces and practices to safeguard life. But Bakker et al. (2005) believe such behaviours of the workers are dependent on the adequate provision of the necessary resources.

The conclusion of Sinclair and Hamill (2007) strongly suggests that the management of organisations "need to provide their workers with the needed resources to cope with the demands of work as far as possible" (p. 11). Accordingly, such resources should enable workers to timely come back from any adverse event or demand that limits their work functions. Attendants, for example, should be able to recover quickly from such events like sleep deficit, stress and workplace injury, and to restart work. Since job demands independently influence workplace injury rate, monitoring psychosocial and physical workplace exposures to promote worker health and safety becomes important (Cantley et al., 2015). Thus, within such a strongly positive PSC, there is lower reported injury and shorter time of return to work (Lind et al., 2009; Wall et al., 2006). Furthermore, to advance the contributions of fuel station attendants to organisational PSC that fosters health and safety, positive team cooperation is

imperative. At fuel outlets where such cooperative team structure is given a needed opportunity to develop, positive emotional interaction is more likely to exist among shifts and other worker groups. This may differentiate one OMC or fuel station from another in terms of PSC and fuel station attendants' contributions to safety climate (Bakker et al., 2005; Becher et al., 2016; Nguyen et al., 2017).

Given that PSC of OMCs and health and safety of the fuel station attendants differ markedly and that the workers equally significantly influence the level of PSC and health and safety (in this study), the management has a duty to increase the workers' involvement. The management of OMCs and fuel stations need to pragmatically take actions to advance the workers' contributions to the station's safety climate. This in turn increases productivity and health, safety and well-being of the workers (Becher et al., 2016). Though increasing the level of station PSC may bring some among of economic burden (Dollard et al., 2012a), its positive effects in terms of the rise in fuel station attendants' morale, sales, and reduction in stress, injury, harassment and bullying and eventual compensation rate is evidenced (Dollar et al., 2014; 2012ce). Besides, such a positive safety climate may yield high job satisfaction, safety motivation and improved safety behaviour, all of which promote the well-being of the typical attendant (Smit et al., 2016). Moreover, when attendants are made to take responsibility of increasing station safety climate, it tends to awaken their safety consciousness that enhances their health and safety (Hafner et al., 2015).

The low OMCs' and fuel stations' PSC and their consequence adverse effects on health and safety conditions of the attendants has the tendency of putting much pressure on the already overburdened health system (Clarke, 2008;

Harvard Business Review, 2013). Therefore, there is the need to formulate policies to practically increase, monitor and periodically evaluate PSC and its effects on the health and safety of the workers (Akpan, 2011). Hence, a national health and safety policy becomes an important foundation to demanding workplace safety measures that protects the workers (Annang, 2014; Tsung-Chih et al., 2007). Nevertheless, the non-existence and fragmented national safety regulations (Annan, 2011; Annang, 2014), organisations have moral, legal and economic duties to provide safe working environment for their workers (Clarke, 2010). It is typically based on policies and regulations that such safety measures thrive. Providing for the safety of the typical worker is no more a matter of privilege, rather a fundamental human and economic right of both the worker and the employer.

The results and finding of the study, at this stage, confirm the assertions of other researchers that PSC is an organisational construct (Dollar, & Bakker, 2010; Bailey et al., 2015b). In addition, in the presence of high positive workplace PSC health and safety of employees is protected (Bailey et al., 2015b). Furthermore, this finding adds that workers are equally important in promoting workplace PSC, an observation that is new to the literature on PSC. Workers are the operators of measures that materialize PSC and its benefits. That, the effectiveness of the efforts of senior management towards promoting, protecting and preserving of the health and safety is largely dependent on the workers (Dollard et al., 2014; 2011; Garrick et al., 2014). Therefore, any difference in organisations' PSC and their workers' health and safety is equally a product of employees' commitment or attitude towards those measures.

**Research Question Five: To What Extent do PSC, Job Demands and Job Resources Predict Worker Health and Safety of FSSAs in Accra, Ghana?**

The power of PSC, job demands and job resources to predict health and safety status of the attendants was determined with SEM-PLS using a SmartPLS 3 software (Ringle et al., 2015). This is a 'true' reflective model, in that all the arrows point from the latent variables towards their indicators (Ringle, & Sarstedt, 2016; Sarstedt et al., 2016). The report begins with the assessment and reporting of overall model fit (SRMR) and model convergence (stop criterion iteration). This is followed by the evaluation of outer model's convergent and discriminant validity using cross-loadings and outer loadings, respectively. The assessment of the outer model is a pre-requisite to that of inner model. Reporting the inner model involves an evaluation of construct reliability by the use of composite reliability ($\geq 0.70$) and convergent validity with AVE values ($\geq 0.60$). In addition, discriminant validity using a Fornell and Larcker (1981) criterion, $R^2$ or $R^2adj$, path coefficients, and $Q^2$ are evaluated (Dijkstra, & Henseler, 2015; Hair et al., 2014a).

The model achieved a good fit, SRMR of 0.06 (criterion $\leq 0.08$) and stopped at iteration 7, maximum being 300 (Hair et al., 2014a; 2011). Moreover, indicator outer loadings and cross-loadings confirmed their discriminant and convergent validity. The item loadings are between 0.74 and 0.86 on PSC, 0.83 and 0.90 on job demands, 0.81 and 0.89 on job resources, and 0.73 and 0.90 on health and safety. These loadings are highest, over 0.70, and loaded highest on their respective latent variables than they did on others (see Table 6). These satisfied item reliability (Dijkstra, & Henseler, 2015; Wong, 2013).

**Table 6: Summary of the Results of Reflective Model**

| Latent Variables (LV) | Indicators | Loadings | Composite Reliability | AVE |
|---|---|---|---|---|
| Health and Safety | | | 0.919 | 0.655 |
| | Heal1 | 0.776 | | |
| | Heal2 | 0.838 | | |
| | Heal4 | 0.895 | | |
| | Heal5 | 0.728 | | |
| | Heal7 | 0.886 | | |
| | Heal8 | 0.752 | | |
| Job Demands | | | 0.949 | 0.755 |
| | Job Demands1 | 0.828 | | |
| | Job Demands2 | 0.894 | | |
| | Job Demands4 | 0.901 | | |
| | Job Demands8 | 0.851 | | |
| | Job Demands10 | 0.863 | | |
| | Job Demands11 | 0.876 | | |
| Job Resources | | | 0.913 | 0.724 |
| | Job Resources1 | 0.870 | | |
| | Job Resources2 | 0.889 | | |
| | Job Resources3 | 0.831 | | |
| | Job Resources4 | 0.811 | | |
| PSC | | | 0.953 | 0.650 |
| | PSC1 | 0.767 | | |
| | PSC2 | 0.737 | | |
| | PSC3 | 0.802 | | |
| | PSC5 | 0.817 | | |
| | PSC6 | 0.857 | | |
| | PSC7 | 0.826 | | |
| | PSC8 | 0.806 | | |
| | PSC9 | 0.834 | | |
| | PSC10 | 0.838 | | |
| | PSC11 | 0.833 | | |
| | PSC12 | 0.749 | | |

An inner model collinearity evaluation indicated that such problems did not exist between the constructs. The VIF of the PSC, job demands and job resources, the IV, were 1.16, 1.00 and 1.16, respectively. These are greater than one and less than five, an indication of no collinearity problem between each set of predictor variables (see Table 7).

**Table 7: Coefficients of PSC, Job Demands, Job Resources, and Health and Safety**

| Model | Unstandardized Coefficients | | Std. Coefficients | t | Sig | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| Constant | 40.88 | 1.56 | | 26.16 | .00 | | |
| PSC | .14 | .02 | .21 | 6.63 | .00 | .86 | 1.16 |
| JD | -.33 | .02 | -.43 | -14.63 | .00 | .99 | 1.02 |
| JR | -.27 | .04 | -.19 | -6.04 | .00 | .86 | 1.16 |

**Key: JD = Job Demands, JR = Job Resources**

Further, a structural model assessment revealed that the conditions for composite reliability and convergent validity have been fulfilled (Dijkstra, & Henseler, 2015). With the AVE, construct convergent validity ranged from as low as 0.65 to as high as 0.76. These are higher than the cut-off point of 0.60 (Henseler et al., 2016; Ringle, & Sarstedt, 2016). Besides, latent variables' composite reliability ranged from lowest of 0.91 to the highest of 0.95, higher than 0.70 cutoff point (Wong, 2016).

Moreover, using Fornell and Larcker (1981) criterion, PSC, job demands, job resources and health and safety achieved acceptable discriminant validity. According to this benchmark, discriminant validity is achieved if the square root of AVE in each latent variable is larger than other correlation values across the latent variables (diagonal values). Meanwhile, these values should be 0.70 or higher; for construct discriminant validity to be achieved (Garson, 2016; Matthews et al., 2016). Thus, discriminant validity was achieved and these constructs are different and measure different phenomena (see Table 8).

**Table 8: Discriminant Validity using Fornell and Larcker Criterion**

| Latent Variables | H&S | JD | JR | PSC |
|---|---|---|---|---|
| H&S | **0.810** | | | |
| JD | 0.671 | **0.869** | | |
| JR | 0.040 | 0.008 | **0.851** | |
| PSC | 0.148 | 0.073 | 0.481 | **0.806** |

**Key: JD = Job Demands, JR = Job Resources, H&S = Health and Safety**

The analysis further indicates that combined PSC, job demands and job resources explained 47% of the variance in health and safety ($R^2adj$ = 0.47). PSC further explains 23% of job resources ($R^2adj$ = 0.23) and about 0% of job demands ($R^2adj$ = 0.005). The inner model path coefficients suggested that job demands has the strongest but negative ($r$ = -0.66) effect on health and safety, followed by PSC that has strong direct positive effect ($r$ = 0.16) and job resources ($r$ = -0.12). In addition, PSC has strong moderate effect on job resources (r = 0.48) but weak and non-significant ($r$ = 0.07) on job demands (see Figure 6). This is because it is less than 0.1 (Ringle, & Sarstedt, 2016; Sarstedt et al., 2016).

The PLS bootstrapping further confirmed the paths' strength and significance except for the path relationship between PSC and job demands. A path's strength depends on its values which are significant if they are higher than 1.96 at 0.05 (see Figure 7). Furthermore, the evaluation of constructs' predictive relevance shows that Stone-Geisser construct cross-validated redundancy ($Q^2$) ranges between 0.16 and 0.29 (Hair et al., 2016). Additionally, indicator cross-validated redundancy ranges between 0.12 and 0.52.

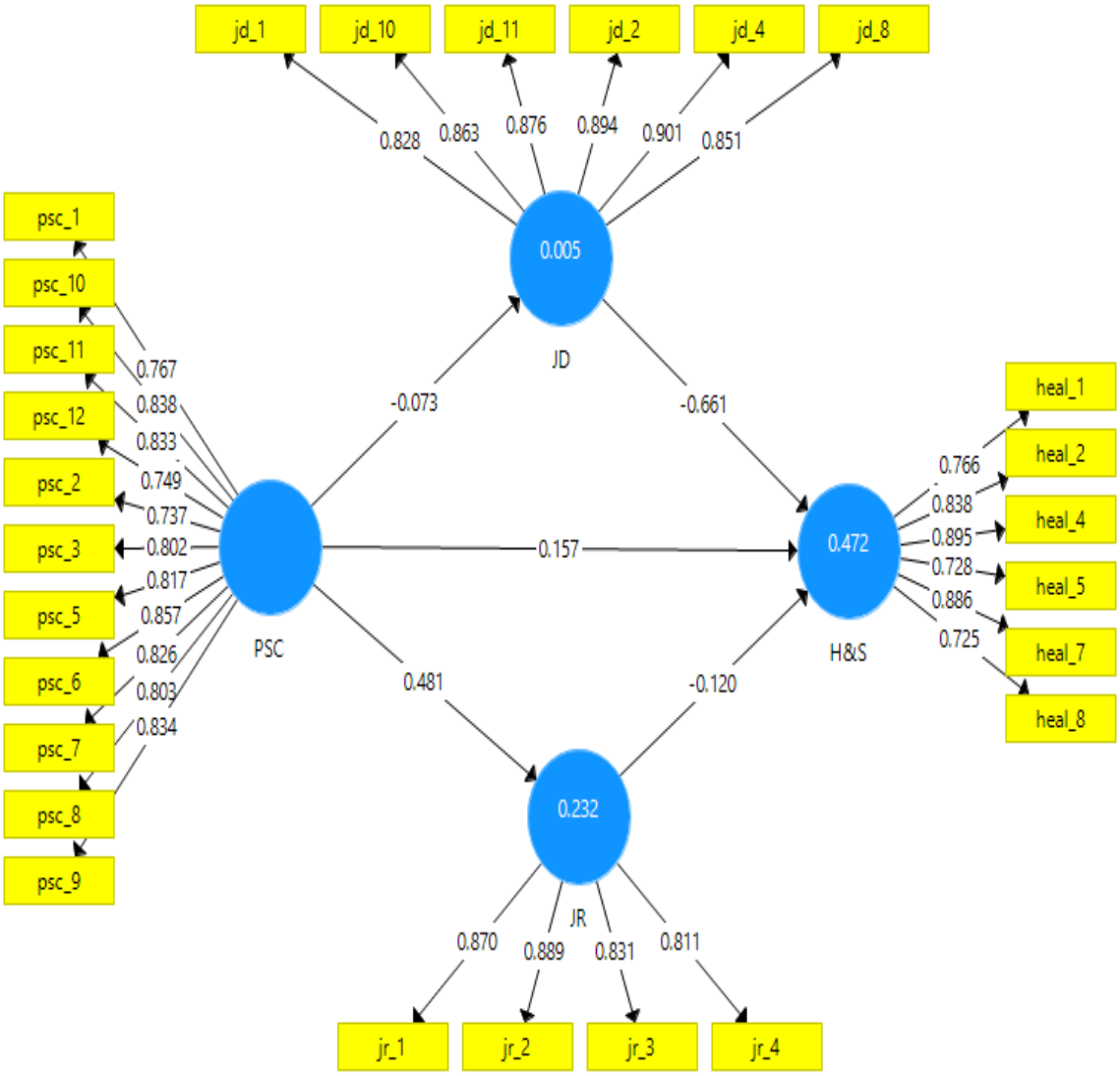


**Figure 6: PLS-SEM Reflective Model Predicting Health and Safety from PSC, Job Demands and Job Resources**

These indicate the relevance and significance of the model containing PSC, job demands and job resources in predicting health and safety (Sarstedt et al., 2014). Therefore, PSC and job demands are independently significant, moderate and relevant direct predictors of the health and safety of the fuel station attendants.

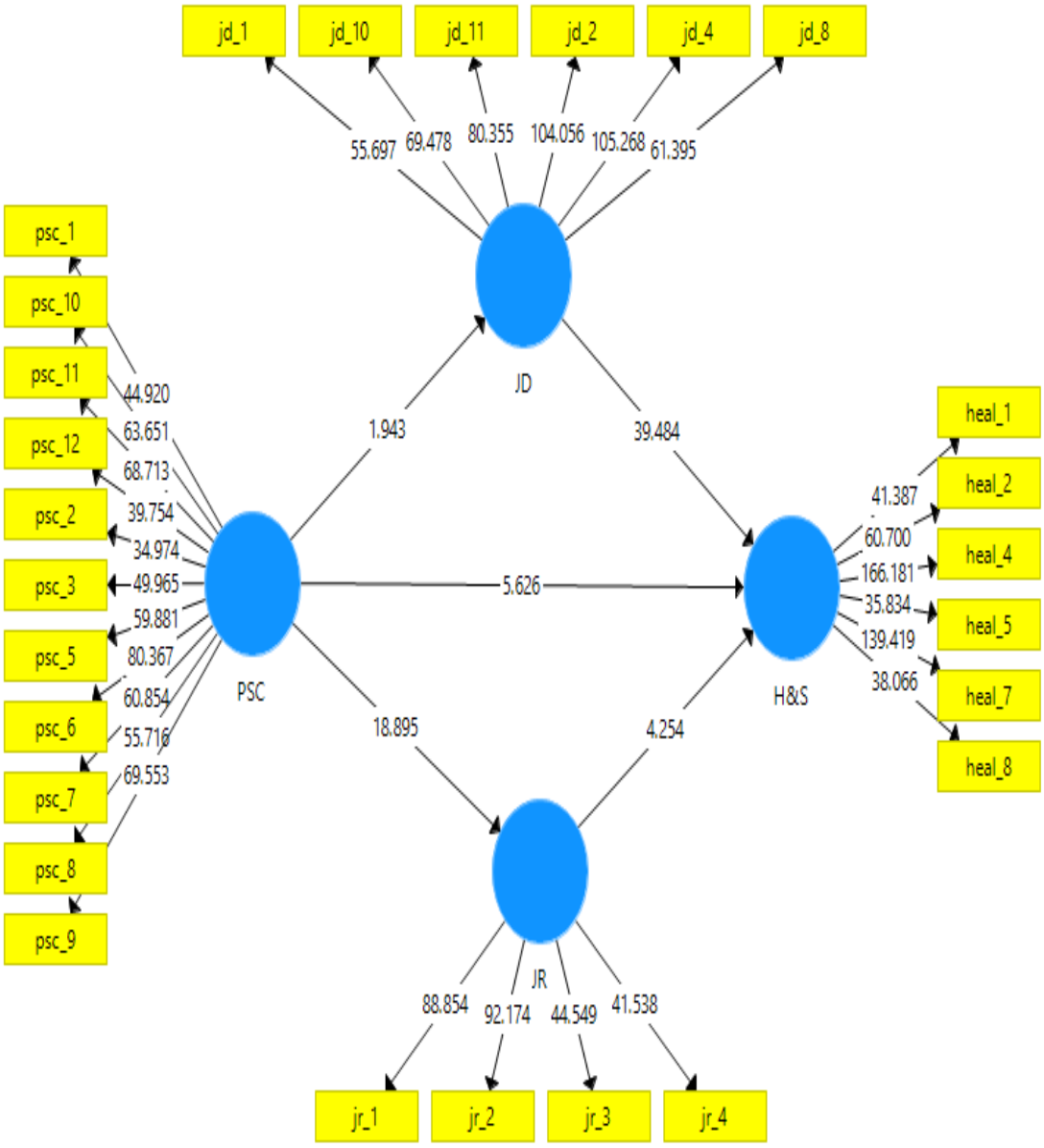


**Figure 7: Summary Results of the Bootstrapping Procedure Predicting Health and Safety from PSC, Job Demands and Job Resources**

However, job resources is found to be a significant, direct, relevant and low predictor of health and safety of the fuel station attendants. Furthermore, PSC directly predicts health and safety and indirectly via the path of job resources but not on job demands. This indicates that the linkages of PSC to health and safety, of PSC via job resources to health and safety, of job demands to health and safety and of job resources to health and safety hold, but those of PSC via job demands

to health and safety does not. The theory of PSC therefore partially holds that when the PSC of an organisation is determined, health and safety of the workers can be predicted and through the health motivation path of job resources (Dollard, & Bakker, 2010; Dollard et al., 2012ab).

The findings here indicate that PSC, job demands and job resources are relevant predictors of health and safety of the fuel station attendants. Distinctively, PSC and job demands are significant, and moderate predictors of health and safety whereas job resources is a significant, but low predictor of the fuel station attendants' health and safety. Furthermore, PSC directly and indirectly through the path of job resources, predicts the health and safety of the fuel service station attendants. In addition, the irrelevant path between PSC and job demands indicates the low level of PSC and high job demands in the fuel station settings. The negative and low relationship between job resources and health and safety further confirms nonexistence of and the extent to which support attendants receive from each other and supervisors influences their health. This findings confirm the assertion of many authors that work climate, whether safety or economic, affects both directly and indirectly the health, safety and well-being of the typical worker (Colley et al., 2013; Dollard et al., 2015; 2012bc; Geldenhuys, Łaba, & Venter, 2014; Son, & Kim, 2015).

It is important to make a point here that these three variables (PSC, job demands and job resources) exist together to some extent in every workplace. Perhaps, the degree to which they exist and influence each other is the matter of concern to health and safety researchers and other stakeholders in the world of work. In the first instance, PSC is a "cause of cause" (Dollard et al., 2012b, p. 2) and antecedent to factors and measures aiming at the health, safety and the well-

being of workers (Winwood et al., 2015). In a typical work setting, PSC would be demonstrated by the extent to which senior managers are committed and give support for the prevention of stress arising from work. Besides, the degree to which managers prioritize the issues of health and safety of the workers over productivity goals is another concern (Kaynak et al., 2016). Furthermore, PSC is seen in the level and channel of senior management's health and safety communication and the extent of their participation and involvement and that of the workers in matters relating to health and safety (Hall et al., 2010; Dollard, & Bakker, 2010; Dollard et al., 2011). As Law et al. (2011) view PSC as a shared perception of the workers concerning organisational policies, practices and procedures, Bailey et al. (2015a) believe it directly influences the protection of the workers' health and safety.

In advancing the argument for the effect of PSC on worker health and safety, Garrick et al. (2014) found a main effect of PSC on both chronic fatigue and work engagement. This occurred among a large sample of Australian basic school teachers where the researchers investigated school PSC on psychological health outcomes. In view of their findings, they noted that teachers at schools with lower PSC also reported higher fatigue level and lower engagement outcomes even after controlling for the effects of job demands. Job demands was also found to relate positively to worker stress, burnout and exhaustion (Brough et al., 2014; Lanciano, & Zammuner, 2014). Besides, PSC was negatively related to fatigue levels and positively to work engagement (Dollard, & Bakker, 2010). Similarly, in an attempt to find the buffering role of PSC on the health impairment, Hall et al. (2013) further affirmed that in organisations with high recorded PSC, there was also a reduction in depression and fatigue. Conversely,

in organisations with a less reported safety climate, there was a direct consequence higher rates of the two health conditions.

The finding of the current study corroborates that of Garrick et al. (2014) and Hall et al. (2013), though these two studies are Australian-based and both studied teachers and other organised work groups. Some other findings of this study revealed a general low PSC among the OMCs and their fuel service stations. Besides, attendants also reported deteriorated health and safety status which might include some of the conditions like depression and chronic work fatigue. Depression and fatigue, especially chronic fatigue, are serious psychological health conditions (American College of Occupational and Environmental Medicine et al., 2012). These health issues are much associated with workers who work for long hours and have higher job demands, such as those found among nurses (Alexandrova-Karamanova et al., 2016; van der Molen et al., 2011) and fuel station attendants (Olastse, 2010). For example, complications of fatigue, such as chronic fatigue, can lead to depression, stress, headache, mood change, back pain, high blood pressure and cardio-respiratory effects (American College of Occupational and Environmental Medicine et al., 2012). In such a state, fuel attendants are most likely to report higher amount and degree of injury and other health problems, owing to the nature and conditions of their work environment (Monney et al., 2015), owing to the failed ameliorating measures.

Recovery would be needed for these attendants in such an environment with high work demands coupled with long working hours over the shifts. But a low level of organisational PSC could undermine this and pose higher health and safety hazards to these attendants (Dollard et al., 2012e; Kessler et al., 2008). In averting this, work engagement would have to be promoted at the downstream oil

industries. Work engagement is in part a manifestation of PSC (Geldenhuys et al, 2014). It shows in vigour, the dedication and enthusiasm workers possess and with which they work (Dollard, & McTernan, 2011). To prevent these health and safety compromising situations, senior managers of the OMCs and fuel stations would need to pay particular attention to developing a vibrant PSC. They need to further build environments conducive to fuel attendants' psychological and physical health and safety (Garrick et al., 2014). Station managements need to further recognise the higher demands of fuel station job and understand its effects on the health, safety and well-being of the fuel station attendants.

Furthermore, whereas PSC indirectly, via job resources, influences health and safety, job demands and job resources have direct main effects on health and safety of these fuel station attendants. This goes to confirm the low level of PSC at OMCs and fuel service stations. And in such a workplace, workers' health and safety status are going to be compromised while they experience the burden of job demands. To support this assertion, Dollard and Bakker (2010) indicated among a number of workers that the main effect of PSC on psychological health problems became non-significant after controlling for job demands. In a large diverse sample as from the developed world as Australia, it is expected that the workers would acknowledge the effects of job demands on their health and safety.

Moreover, where there is lower reported PSC as in this case, the effects of job demands on the health and well-being of workers become prominent (Garrick et al., 2014). However, despite the fact that the current study uses the same kind of analytical tool (SEM-PLS) as the previous one, the attendants are from one industrial sector and their job demands are high and monotonous (Olastse, 2010). I further argue that in the presence of the chronic job demands,

attendants experience injuries, psychological distress, emotional exhaustion and other physical health problems (Seidler et al., 2014). On the other hand, where fuel station attendants experience the actualization of higher PSC and supervisor and co-worker support, the influence of job demands on their health becomes reduced. This is more likely to result in the improvement of both physical and psychological health and safety (Azma et al, 2013; Okoye, & Aderibigbe, 2014) among the fuel station attendants. But this seems not to be the case among participants in this current research.

Findings of other studies support the finding of the current study that job resources moderates the influence of PSC on health and safety among various worker groups (Dollard, & Bakker, 2010; Garrick et al., 2014). In their meta-analysis, Nahrgang et al. (2010) showed that the health erosion and motivational pathways are mechanisms by which resources relate to health and that PSC is expected to precipitate these paths and prevent errors, accidents, injuries and death (Dollard et al., 2011). Both PSC and job resources are organisational variables that are supposed to protect, preserve and promote the health, safety and well-being of the employee (Dollard et al., 2012ab; Idris, & Dollard, 2011). However, the evidence of the presence and effectiveness of PSC in part rest on the extent of the existence and the degree of job resources (Dollard et al., 2012c).

A plausible reason is that at a typical OMC or fuel service station, the safety management practices, which reflect PSC, from the sales executives including area heads, marketing managers, accountants, auditors, station managers and supervisors have direct effects on how job resources is manifested and perceived by attendants (Cigularov et al., 2010; Law et al., 2011). Thus, according to Dollard and McTernan (2011), PSC precedes and moderates the

effects of job resources (supervisor support, co-worker support) have on the typical employee's perception of the difficulty or otherwise of their jobs. Besides, a positive downstream oil industry's safety climate would encourage supervisor and other middle level management's support. These support activities may be demonstrated in advocating for fuel station attendants' safety protection and providing helping hands when the workers are under pressure in serving customers (Ansah, & Mintah, 2012).

Supervisors are the immediate management staff that liaise between the senior management and the fuel station attendants at every fuel station. They interact regularly on a daily basis with the attendants (Ansah, & Mintah, 2012). The effectiveness of this daily constant supervisor-attendant interaction is supposed to result in positive attendant-attendant work relationship (Cigularov et al., 2010). Bond et al. (2010) further assert that a positive supervisor-worker and worker-worker relationship has promotive effects on health, safety and well-being of the employees. It implies that at fuel stations where there is a high positive safety climate, supervisors are more likely to provide both physical and emotional assistance to attendants. Besides, this support and safety climate encourages good working cooperation among attendants. In such an organisational climate, worker health and safety is likely to be enhanced (Lindeberg et al., 2010; Seidler et al., 2014). Thus, the enhancement of the health, safety and well-being of the attendants is dependent on the degree of PSC and its consequent effects on the availability and extent of job resources. In effect, Dorllad et al. (2012b) found among some Malaysian industry sector workers that PSC is an antecedent to organisational job resources and job satisfaction that promote worker health and well-being.

Although, job demands did not significantly moderate the influence of PSC on health and safety, it directly predicted health and safety of the fuel station attendants. This is the recognition of a high chronic presence of job demands at the fuel stations (Monney et al., 2015). The health and safety implications of chronic job demands on attendants can be devastating especially where evidence shows presence of low organisational PSC (Cantley et al., 2015). High job emotional and physical demands, as in the case of attendants, coupled with low PSC result in worker burnout or exhaustion and psychological distress, depression, injuries and other health complications (Lanciano, & Zammuner, 2014). In the face of these health and safety challenges, the workers may skip work, or work less while at work. The effects are high hospital attendance, turn-over rate, and compensation claims. These worker adverse health conditions or situations do not only lower productivity at the stations, they create further burden of the health systems (Annang, 2014; Hafner et al., 2015; Kaynak et al., 2016). It then becomes imperative for the management of fuel stations to practically improve the safety climate of the stations and promote serious supervisor-attendant and attendant-attendant relationships. This is more likely to serve as a buffer to the effects of chronic and existing job demands on health and safety of the fuel station attendants.

It is important also to note that PSC is a policy-driven organisational variable within which other policies, procedures and practices are created to increase the health and safety of the worker (Yulita et al., 2016). Thus, both national (Clarke, 2010) and organisational level safety policies are important to reaching the health and safety goals of attendants (Annang, 2014; Ansah, & Mintah, 2012). Within PSC, it is prudent that senior management makes effort to

formulate policies that regulate their own safety activities. This safety policy should aim at giving priority to attendants' safety compared to increasing sales. Further, it should promote a bottom-up safety communication and participation of both management and workers in issues of health and safety (Dollard et al., 2014). It is equally adequate to task sales executives and marketing managers of the OMCs and managers of fuel service stations to make effective policies and regulations that may aim at enhancing the health and safety of the fuel station attendants. Fuel station policies have to promote effective worker cooperation and support and supervisor-worker interaction.

**Research Question Six: To What Extent do Job Resources and PSC Mediate Effect of Job Demands on Worker Health and Safety of FSSAs in Accra, Ghana?**

To determine the mediating effect of job resources and PSC on the influence of job demands on health and safety of the fuel station attendants, SEM-PLS was calculated. First, a partial model containing job demands and health and safety was built to test the direct effect of job demands on health and safety. The second analysis involved building a complete model containing job demands as the IV or the exogenous latent variable, with job resources and PSC as mediators, and health and safety acts as the DV or the endogenous latent variable (see Figure 8). The suitability of the model (complete) was assessed by the indictor reliability, which is the measurement model (see Figure 8).

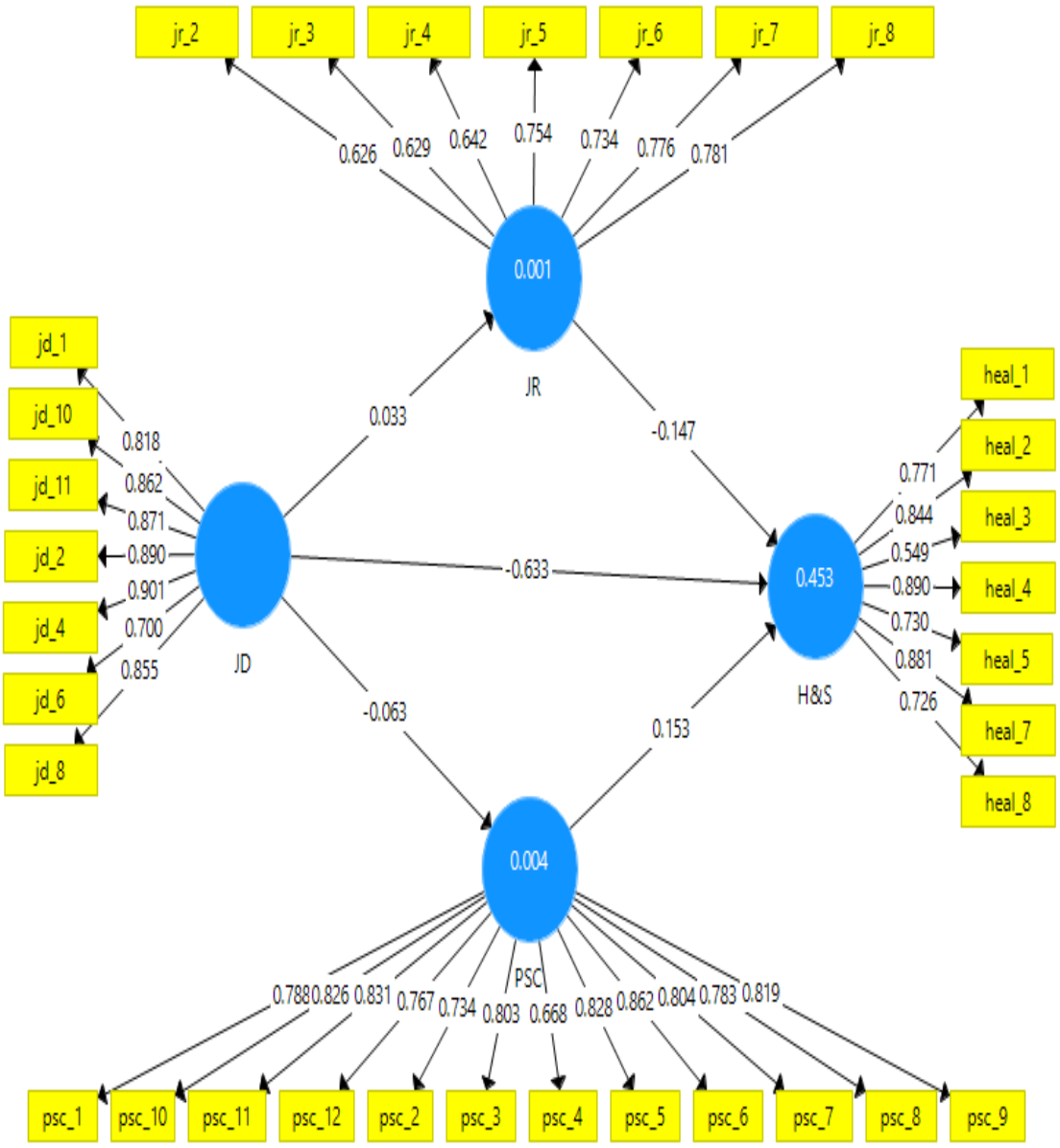


**Figure 8: PLS-SEM Reflective Model Showing Indicator Reliability of PSC, Job Demands, Job Resources and Health and Safety**

Moreover, indicator outer loadings also suggested that the items loaded highest to their respective latent variables than they did on others (see Table 9). Some items with outer loadings less than 0.5 were deleted from the initially specified complete model. They included items 3, 5, 7, 9 and 12 from job demands, item 1 from job resources and item 6 from health and safety.

**Table 9: Summary of the Results of Reflective Structural Model**

| Latent Variables (LV) | Indicators | Loadings | Composite Reliability | AVE | |
|---|---|---|---|---|---|
| Health and Safety | | | 0.913 | 0.605 | |
| | Heal1 | 0.771 | | | |
| | Heal2 | 0.844 | | | |
| | Heal3 | 0.549 | | | |
| | Heal4 | 0.890 | | | |
| | Heal5 | 0.730 | | | |
| | Heal7 | 0.880 | | | |
| | Heal8 | 0.727 | | | |
| Job Demands | | | 0.945 | 0.714 | 1.01 |
| | Job Demands1 | 0.818 | | | |
| | Job Demands2 | 0.890 | | | |
| | Job Demands4 | 0.901 | | | |
| | Job Demands6 | 0.700 | | | |
| | Job Demands8 | 0.855 | | | |
| | Job Demands10 | 0.862 | | | |
| | Job Demands11 | 0.871 | | | |
| Job Resources | | | 0.862 | 0.503 | 1.07 |
| | Job Resources2 | 0.626 | | | |
| | Job Resources3 | 0.629 | | | |
| | Job Resources4 | 0.642 | | | |
| | Job Resources5 | 0.754 | | | |
| | Job Resources6 | 0.734 | | | |
| | Job Resources7 | 0.776 | | | |
| | Job Resources8 | 0.781 | | | |
| PSC | | | 0.953 | 0.631 | 1.07 |
| | PSC1 | 0.788 | | | |
| | PSC2 | 0.734 | | | |
| | PSC3 | 0.803 | | | |
| | PSC4 | 0.668 | | | |
| | PSC5 | 0.828 | | | |
| | PSC6 | 0.862 | | | |
| | PSC7 | 0.804 | | | |
| | PSC8 | 0.783 | | | |
| | PSC9 | 0.819 | | | |
| | PSC10 | 0.826 | | | |
| | PSC11 | 0.831 | | | |
| | PSC12 | 0.767 | | | |

The re-specified model (complete) yielded acceptable loadings or values that ranged from 0.67 to 0.84 for PSC, 0.70 to 0.90 for job demands, 0.63 to 0.78 for job resources and 0.55 to 0.88 for health and safety (see Table 9, Figure 8).

The structural model (complete) achieved a good fit; *SRMR* = 0.08, the criterion being ≤ 0.08. Besides, the model analysis converged at 7th iteration, maximum being 300 (Hair et al., 2014a; Henseler et al., 2016). Furthermore, the structural model (complete) was evaluated by applying convergent validity using AVE, composite reliability, discriminant validity on a criterion of Fornell-Larcker (1981) and the extent of construct collinearity with VIF (Henseler et al., 2016). PLS-SEM results indicated that constructs were reliable ranging from 0.86 to 0.95 (see Table 9 above).

The constructs also converged adequately, such as health and safety = 0.61, job demands = 0.71, job resources = 0.50 and PSC = 0.63, the cutoff point being ≥ 0.50. The VIF values of job demands = 1.01, job resources = 1.07 and PSC = 1.07, are indication of no collinearity problem among IVs (see Table 9). The results further established that the inner model's discriminant validity was met (Fornell & Larcker, 1981; Wong, 2013). This is because the square root of AVE for health and safety, job demands, job resources and PSC are much larger than the corresponding latent variable correlations (see Table 10).

**Table 10: Discriminant Validity for the Complete Model using Fornell and Larcker (1981) Criterion**

| Latent Variable | H&S | JD | JR | PSC |
|---|---|---|---|---|
| H&S | **0.78** | | | |
| JD | 0.65 | **0.85** | | |
| JR | 0.13 | 0.03 | **0.71** | |
| PSC | 0.16 | 0.06 | 0.25 | **0.79** |

Additionally, PLS-SEM results showed that job demands alone accounted for about 43% ($R^2$ = 0.43) of the variance on health and safety of the fuel service station attendants in the initial model. Moreover, variance explained in health and safety by the job demands, job resources and PSC increased to about 45% ($R^2$ = 0.45) in the complete model. However, the path coefficient between job demands and health and safety in the initial model (0.66) was reduced to 0.63 in the presence of job resources and PSC in the complete model. The strength of the paths revealed that the strongest path in the complete model is that of job demands → health and safety (0.63) follow by PSC → health and safety (0.15) and job resources → health and safety (see Table 11).

The mediation test indicates a significant direct effect of job demands on health and safety ($t$ = 45.15, $p$ = 0.00), when a bootstrapping procedure was applied to the initial model. The direct effect was still significant in the complete model but reduced ($t$ = 39.16, $p$ = 0.00) in the presence of PSC and job resources. But for a mediation to be concluded, the indirect effects needed to be checked and determined. Though there is reduction in the strength and significance of the job demands on health and safety from initial to complete models' direct effect, an evaluation of indirect paths (job demands → PSC → health and safety and job demands → job resources → health and safety) is needed to conclude mediation. The two indirect paths are also significant (job demands → PSC → health and safety = 7.64 and job demands → job resources → health and safety = 5.31) in the complete model (see Figure 9, Table 11).

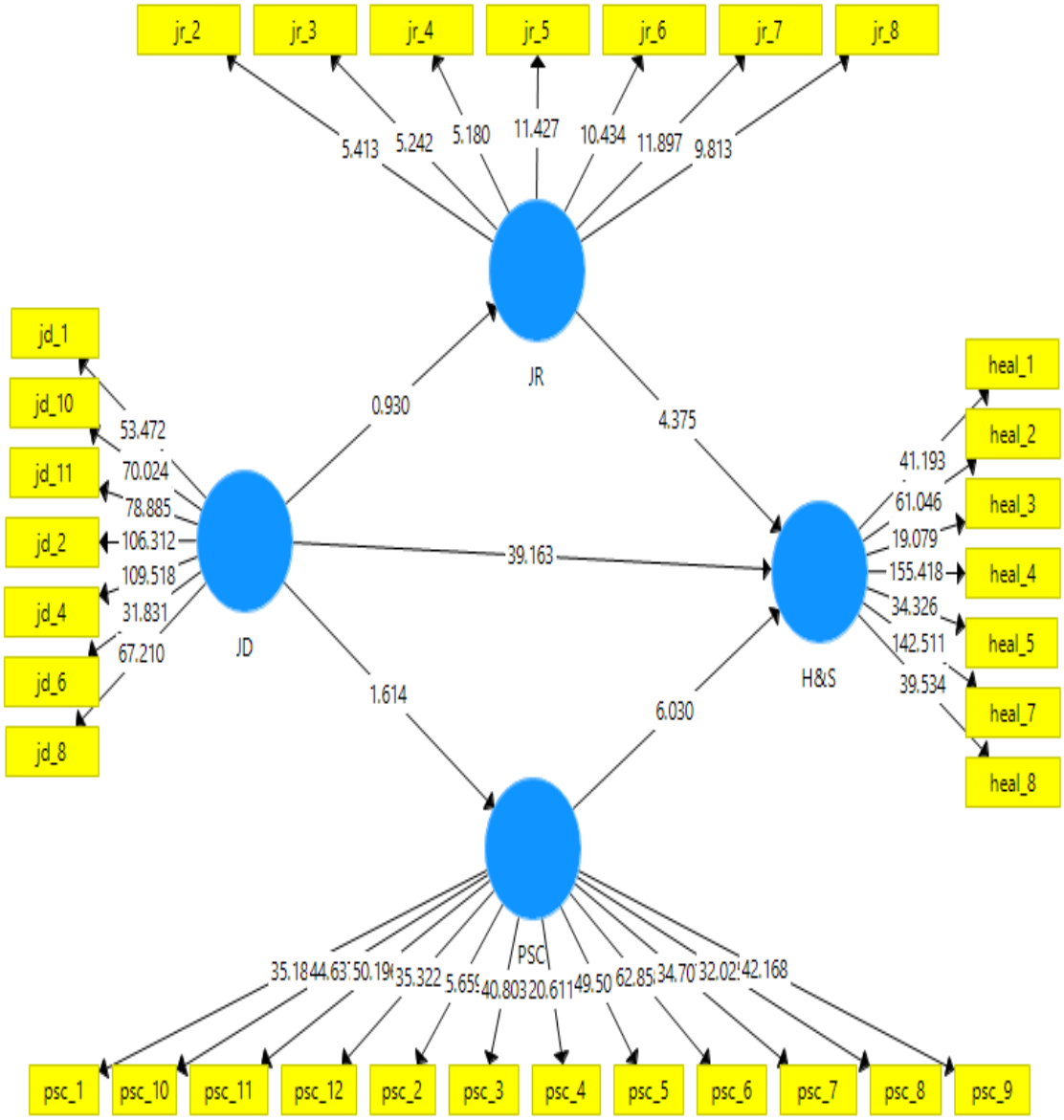


**Figure 9: Summary of the Significance Mediating Effect of Job Resources and PSC on the Effect of Job Demands on Health and Safety**

Therefore, because the job demands still has a significant effect on health and safety in the inclusion of job resources and PSC, job resources and PSC become partial mediators of the effect of job demands on health and safety (Nitzl et al., 2016) among the fuel station attendants. Therefore, the theory of PSC tentatively holds and that they mediate the effect of job demands on health outcome variables of the workers.

**Table 11: The Mediating Effect of Job Resources and PSC on the Effect of Job Demands on Health and Safety**

| Path | Path Coefficient. | t-values | p-values |
|---|---|---|---|
| Initial Model | | | |
| Direct Effect | | | |
| Job Demands → Health and Safety | -0.65 | 45.15 | 0.00 |
| Complete Model | | | |
| Direct Effect | | | |
| Job Demands → Health and Safety | -0.63 | 39.16 | 0.00 |
| Job Demands → Job Resources | 0.03 | 0.93 | 0.35 |
| Job Demands → PSC | -0.06 | 1.61 | 0.11 |
| PSC→ Health and Safety | 0.15 | 6.03 | 0.00 |
| Job Resources → Health and Safety | 0.15 | 4.38 | 0.00 |
| Indirect Effect | | | |
| Job Demands → PSC → Health and Safety | | 7.64 | |
| Job Demands → Job Resources → Health and Safety | | 5.31 | |

The theory further holds that where there are positive job resources and organisational PSC, the effect of job demands on health and safety of these fuel station attendants would be reduced (Dollard, & Bakker, 2010, Dollard et al., 2014; 2012ab). The finding suggests partial mediation roles of PSC and job resources in the influence of job demands on health and safety. The significant effect of job demands on health and safety in the presence of job resources and PSC is an indication of the strong effects fuel station jobs have on the health, safety and well-being of these attendants. PSC and job resources are two ameliorating organisational factors whose high presence at the workplace is

supposed to leverage the negative effects of the various work demands on the workers (Kouabenan et al., 2015; Law et al., 2011; Winwood et al., 2015).

PSC for instance is observed to be a 'cause of cause' (Dollard et al., 2012b, p. 2). First, PSC serves as a precursor, giving birth to favourable supervisor-employee relations and among co-workers. It further strengthens the effectiveness of such cooperation in the organisation. Second, PSC prevents the telling effects of work psychological and physical demands on the workers and their health and safety (Stevens, & Bowden, 2015). The high presence of supervisor-worker relationship is mostly in opposition to the negative impacts of job on the well-being of the worker. Moreover, evidence further revealed that positive interactions among workers provide buffer for health outcomes of the typical employee (Azma et al., 2013; Okoye, & Aderibigbe, 2014). It is expected in the fuel station industry where there is positive organisational safety climate, coupled with a good supervisor-supervisee and co-worker relations, the negative effects of the high job strains on the health and safety of the attendants would be reduced (Dollard et al., 2012de; Monney et al., 2015; Olastse, 2010).

The positive influence of PSC and job resources on the effects job demands on health and safety found in this current study is not surprising, as many early scholars have pointed to the same (Dollard, & Bakker, 2010; Garrick et al., 2014; McTernan et al., 2013). Every work comes with some amount of demands. But high monotonous, customer service and physically demanding jobs like those at fuel stations require high PSC and job resources. These factors would help accommodate the effects of such unfaviourable work conditions on health and safety of the fuel station attendants (Bailey et al., 2015b; Chawla, & Lavania, 2008). In support of this, Dollard and Bakker (2010), through their longitudinal

study, found among groups of Australian workers that high workplace PSC lowered the effects of emotional demands, work pressure and increased skill discretion. These factors signal high job demands (Nordenmark et al., 2012). The observations of Bond et al. (2010) further show that PSC at high levels provide ameliorating effect to bullying and harassment on posttraumatic worksite stress disorders in Australian security services. Workplace bullying and harassment together, compound the negative effects of job demands which directly affect the health and well-being of workers. At fuel stations where safety climate is low, bullying and harassment may be high and significantly raise the weight of job demands that lower the health outcome variables of the attendants.

At fuel service stations where there are high job demands, it is the ability of the senior managers to create a conducive safety climate that protects the well-being of the fuel station attendants. Senior management's ability to safeguard the health and safety of these attendants may resonate in the provision of necessary human and material resources for work (Dollard, & McTernan, 2011). These resources may have to adequate safety facilities, appropriate PPE, devices and giving workers a sense of job security (Ansah, & Mintah, 2012). Fuel station job demands outcomes are diverse, including long working hours on the feet, dealing with many customers, working with petroleum vapour and having to cope with high job insecurity (Monney et al., 2015). There are serious health and safety consequences including high stress, chronic fatigue, burnout, depression, high injury rate, MDS and cardio-respiratory infections (Garrick et al., 2014; Hall et al., 2013; McTernan et al., 2013). In this case, the detrimental effect of job demands on health and safety of the fuel station attendants is controlled by the context of high safety climate such as PSC. Besides, PSC further increases the

availability of material job resources that promote safety work procedures (Law et al., 2011). In a similar vein, Law et al. showed the mediation function of PSC where it acts as a higher level support variable by providing for peer support. It further provides a conducive worker context where workers feel comfortable utilising available resources to cope with work demands (Dallard et al., 2012c).

Organisational PSC is a management-driven concept that culminates into workplace safety policies, practices and procedures for the protection of worker health and safety (Dollard et al., 2012e; Idris et al., 2012). At the fuel station where there is high level of PSC, managers would take cognisance of risk factors associated with the job. These managers would help to shape jobs where demands are manageable and resources adequately provided. However, at low organisational PSC, attendants are going to experience high job demands including emotional demands and physical demands (Dollard, & Bakker, 2010). However, this relationship could be offset when there are adequate job resources (Bakker, & Demerouti, 2007), which are influenced largely by the organisational context produced through senior managers' safety concerns (Dollard et al., 2012de). Using a hierarchical linear modeling, Dollard et al. (2012e) observed among Australian police officers that the presence of high PSC lowered the positive relationship between emotional demands and increase in distress among the workgroups. They further revealed that high emotional resources also brought about a reduction in the positive effect high job demands had on stress level of the workers. Thus, among fuel station attendants, the presence of positive PSC would become stress risk ameliorating factor. Besides, it would provide buffering effects to health of the fuel station attendants from the adverse of job demands (Idris et al., 2012).

Job resources have direct influence on job satisfaction, absenteeism and presenteeism, psychological distress, emotional exhaustion and physical health effects of workers (Seidler et al., 2014). Perhaps, attendants experiencing high job demands at their stations are more likely to be struggling with job dissatisfaction, absenteeism and presenteeism, psychological distress, emotional exhaustion and impaired physical health status (Gyekye, & Salminen, 2007). But Nel et al. (2015) found job satisfaction to be a significant factor predicting safety at work. Hence, any workplace act, such as availability of job resources, which promotes job satisfaction is likely to reduce the effect of job demands on health of the workers. For instance, an attendant who perceives positive supervisor and co-worker support is equally likely to experience job satisfaction, low job emotional and physical demands, bullying and harassment (Bond et al., 2010; Okoye, & Aderibigbe, 2014). On the contrary, a less perceived supervisor and co-worker support by an attendant could lead to high emotional and physical demands (Azma et al., 2013). According to Nguyen et al. (2017), workplace bullying was reduced when there was reported high co-worker relations among Vietnamese public workers. That is, though there may be high job demands present at the fuel stations and attendants are experiencing their effects, a supervisor-attendant, attendant-attendant conducive environment is most likely to mitigate such effects (Dollard & et al., 2014; 2012bc).

The role of supervisor and co-worker relation at the workplace cannot be underestimated. This is because supervisors, for instance, are the liaison officers between senior management and the attendants. This liaison role culminates to promoting the welfare of the workers (Dollard et al., 2012d). Furthermore, supervisor and co-worker support may be manifesting in the number and quality

of assistants receive including prompting on issues on safety (Lanciano, & Zammuner, 2014). Moreover, supervisors assist their workers to better appreciate and understand work procedures, rules and regulations. These roles of the fuel station supervisors result in a stronger relationship between them and the attendants resulting in the reduction of the negative impacts of work (Kumako, & Asumeng, 2013). In South Africa, Walter (2007) revealed that organisational safety climate can be created by line project managers who are the immediate leaders. In such workplace, safety climate perception would be high (Dollard et al., 2012b), thereby reducing the weight of daily job demands on the worker (Nguyen et al., 2017). A similar study by Kouabenan and others (2015) reiterated the supervisors' role in affecting safety climate perception. Their results among first-line managers showed that supervisors' encouragement was more influential on safety climate perception than that of senior management views. Besides, such climate did not only reduce the perceived burden of work but also affected the health outcome variables of the workers. Additionally, Oxenstierna et al. (2008) noted that where line workers provide assistants to each other, their psychological distress, emotional and physical job demands are normally under control. But Yang et al. (2016b) found among a large and diverse US workers that younger employees and those with average-poor health, co-worker support did not significantly affect job stress, one manifestation of job demands (Burke et al., 2012). In effect, a congenial workplace becomes imperative for such positive workplace interactions to apparently influence health and safety of the workers (Tuckey et al., 2009).

The finding here provides further that the present and future health and safety status of these fuel station attendants could be safeguarded. This would

happen if senior managers pay much more attention to providing safety needs of the attendants. Moreover, the significant effect of the job demands on health and safety in the presence of PSC and job resources provides indication that there is a chronic high job demands faced daily by these fuel service station attendants. In such workplaces, attendants would have challenging health and safety outcomes such as high stress, burnout, injuries and death (Monney et al., 2015). Not only does the job demands at the fuel stations negatively influence the health of the workers, it also lowers their moral and changes their mood (Becher et al., 2016). These would eventually impact negatively on their customer service and lead to reduction in daily sales (Xanthopoulou et al., 2009). But there are window of opportunities to reducing the negative effects such stressful workplace atmosphere on the fuel station attendants. Thus, the ameliorating roles PSC and job resources played on the negative effect of job demands on health and safety means health, safety and well-being of these fuel station attendants can be preserved and promoted. The absence or low levels of PSC and job resources and high level of job demands complicates the health and safety of these fuel attendants.

As organisational variables, PSC and job resources are driven by policies and regulations both of the national and workplace levels (Dollard et al., 2014; 2013). The high presence of job demands further demands that necessary national and organisational level policies and regulations should be given preeminence to guide management to provide for health needs of these attendants. Probably, the few fragmented national safety policies (Annan, 2011) are not being enforced to translate into active workplace safety concerns among senior managers in the downstream oil sector in Accra. Furthermore, it is arguable though, that senior

management have little concern for fuel station attendants' safety, there would be low safety climate that resonance in reduce level of fuel station interaction among attendants and support giving by their supervisors (Yang et al., 2016b). Thus, in OMCs and their fuel stations where safety climate is pronounced, there would be significant level of managers' safety concerns, and high job resources in terms of supervisor and co-worker support (Tims et al., 2013). The health, safety and well-being of the attendants are the absolute beneficiary. For, organisations should not underestimate the concept that the first tenable resource of every organisation is its human capital.

# CHAPTER FIVE

# SUMMARY, CONLCUSIONS AND RECOMMMENDATIONS

The purposes of this study were to: (1) explore the level of organisational PSC among the OMCs at the fuel service stations in Accra, (2) test the paths through which PSC predicts worker health and safety of the fuel station attendants, and (3) determine the extent to which job resources and PSC mediate the influence of job demands on health and safety of the fuel service station attendants in Accra. The study futher hypothesised the significant interaction effects between category of OMC and FSSAs on the perceived PSC levels and worker health and safety of attendants and that PSC, job demands and job resources would predict worker health and safety of FSSAs in Accra, Ghana. This chapter focuses on research summary, main findings, conclusions drawn based on the findings and the recommendations made based on the conclusions.

## Summary

Workplace health and safety promotion gives a safe working environment to every employee. Such an environment is meant to provide protection where work is not hazardous and possess no or minimal risk to the health and safety of the workers. On-the-job accidents were the major cause of injuries and illnesses. They further led to absenteeism and presenteeism, permanent disabilities or even death among several worker groups. The economic cost of these can be devastating on the worker, the family, the organisation and the nation. Several attempts, including behavioural base safety interventions, engineering, and

change of technology, have been made to reduce these problems but they yielded very limited results. Recently, however, evidence has demonstrated that most of these and other serious conditions such as injuries, stress, chronic fatigue, mood change, burnout, emotional and physical exhaustions, depression, and other related health and safety consequences were as a result of workplace psychosocial challenges. For this reason, contemporary research and interventions are heavily drawn to psychosocial climate including safety climate of organisations.

PSC is reflected in the management support for workplace safety and health issues and the priority given to safety over productivity goals. Furthermore, PSC is evident in the extent to which senior managers participate and communicate issues of health and safety of workers. Moreover, PSC is believed to promote and maintain job resources while averting the effects of job demands on health of the workers. Therefore, the theory states that when the organisational PSC is known, the psychological and physical health, job demands and resources can be predicted.

OHS statistics indicated that about 973 million people sustained various degrees of injuries that warranted some type of healthcare with about 4.8 million deaths in 2013/14. These are worrying trends but the situation seems to worsen in developing countries. For example, figures from African countries suggested that more than 54,000 fatal occupational accidents occur annually. Approximately, 42 million work-related accidents took place and caused at least three days' absence from work in 2012. The regional accident rate is about 16,000 per 100,000 with a fatality rate of 21 per 100,000 workers. Furthermore, it is believed that these figures from African are sparse or not up to date and largely underestimated. The evidence by the ILO revealed that there was no workplace

accident, injury or death record about many African countries including Ghana as of 15th May 2017.

The economic cost estimated that four percent of the global GDP is lost due to workplace accidents and poor working conditions. Besides, workplace accidents cost employers between £3.3 billion and £6.5 billion globally each year. Moreover, in the financial year of 2006/07, £393 million was lost in the Britain civil service sector as a result of work related injury absence. This brought the cost per staff per year to about £887.66 million, not to talk about loss affecting productivity and growth. Furthermore, a recent health expenditure data from US indicates that between 1996 and 2013, $87.6 billion was spent on low back and neck pains resulting from the work settings.

The problems of worksite accidents, injuries, diseases and deaths in Ghana and many other African countries are devastatin. In 2015, 99% of fuel service attendants from Kumasi were exposed to extreme weather conditions, 98% inhaled vehicle exhaust fumes, 98% to petrol vapour and 88% to fire outbreaks. Earlier observations revealed an increasing workplace injury and death rates with 80% occurring at night, 54% among manufacturing workers and 63% resulting in deaths. Workplace fire resulted in 53% of the deaths. Also, management factors accounted for 91% injuries. A recent “twin disaster” of fire and flood claimed 159 lives including all the attendants in that service station in Accra. The cost in economic terms indicated that as much as 10% of Ghana’s GDP is lost annually to workplace accidents. However, these figures do not represent the workplace accident statistics in the country. This inadequacy and grossly unrepresentative figures compound the efforts of providing for the health and safety intervention in Ghana.

The current study utilized a 51 item questionnaire. This aspect of the questionnaire meausred management support, and management priority for fuel service station attendants' health and safety. It further, measured organisational participation and communication towards health and safety promotion of the workers. The instrument also measured physical health and safety status of the participants. Moreover, the instrument measured job resources and job demands as perceieved by the participants. Furthermore, the questionnaire collected participants' socio-demographic information such as age, gender, educational level, department of work, company, working experience, injuiry sustained and general health status. The questionnaire was pilot tested and yielded alpha reliability co-efficient of 0.86. Besides, it produced composite relibilities ranging from 0.91 to 0.95 and convergent validity between 0.65 and 0.76.

Data was collected from conviniently sampled fuel service stations and 876 attendants from the four purposively selected OMCs in Accra. Mean was used to provide answer to the research question one. Additionally, the One-Way ANOVA was calculated to test research questions, two, three and four. Moreover, Bonferroni post hoc and effect size using $\eta^2_p$ analyses were calculated to determine, among the groups, where the differences existed, and the magnitude of the existing differences, respectively. Moreover, PLS-SEM was used to test research questions five and six.

**Main Findings**

The following findings were drawn based on the results of the study:

1. There is generally a high risk organisational PSC perception among FSSAs working in the OMCs in Accra, though few of the OMCs/fuel stations have recorded acceptable safety climate.

2. Fuel station attendants have different levels of perception about the organisational PSC levels in their companies. Attendants at the forecourts perceived higher organisational safety climate risk while those at the lube bays and shops are recording moderate risk.
3. The difference in the health and safety status of the fuel station attendants is dependent on their company. But fuel station attendants from Shell reported the poorest health and safety status compared with their counterparts working in all other companies involved in this study.
4. The category of fuel station attendants, the OMCs and the combination of the two created significant differences in the organisational PSC and health and safety state of the attendants. The differences in PSC showed that there were marked risky safety climate perception among Shell attendants compared with those from GOIL and Total companies. Furthermore, the companies with lower or risky perceived PSC such as Allied and Shell also had their fuel station attendants reporting perceived higher risk PSC compared with those with higher perceived levels like GOIL and Total.
5. The organisational PSC, job demands and job resources are direct relevant predictors of health and safety status of the attendants. PSC and job demands are significant, and moderate predictors of health and safety whereas, job resources is a significant, but a negative predictor of the attendants' health and safety status. PSC indirectly through the path of job resources, predicts the health and safety state of the attendants.
6. Organisational PSC and job recources partially mediated the effect of job demands on health and safety status of the attendants. Besides, the mediating

path of job demands-PSC-health and safety status became the most significant one followed by that of job demands-job resources-health and safety.

7. The data for this study fit into the theory of PSC and its model. The data and models provide appropriate results for studying physical health and safety status of workers in a core area like OHS.

**Conclusions**

The following conclusions are drawn based on the findings:

1. The perceived high risk organisational psychosocial safety climate of the OMCs and their fuel service stations is posing serious health and safety challenges to fuel station attendants. However, attendants from Allied and Shell, especially those working at the forecourts are facing the worse forms of workplace health and safety conditions.
2. Senior management of the OMCs and their fuel stations are relenting on their efforts to provide a congenial working atmosphere which aids in preventing, preserving and promoting the health, safety and well-being of these attendants. Perhaps, managers of most of the companies have less commitment and failed to prioritize the health and safety of the attendants. There seems to be top-down or less on-site safety communication which is promoting minimal safety participation from senior management and other station workers like attendants.
3. Organisational PSC is driven by both management and fuel station attendants. Also, the health and safety of the attendants is influenced by the companies and the section of the station they work, either forecourt, shop or lube bay.
4. The health and safety status of the attendants is a direct product of the level of fuel station's PSC, support attendants received from their supervisors and

from each other while at work. The interactions between supervisors and attendants and among the attendants at fuel stations are inadequate but increase in such interactions are important to protecting fuel service attendants from the ill effects of their job routines.

5. The workload and routines work at fuel service stations are having a serious health and safety effects on the attendants. However, these challenges can be effectively prevented and/or reduced by increasing PSC and raising the support supervisors provided for fuel station attendants and that which they give each other while at work. Besides, management efforts are the most essential element to reducing the effects of workload on the health and safety of these attendants.
6. The level of organisational safety climate created by the senior managers through their commitment and priority, participation and communication of health and safety directly and indirectly influence the state of health and safety of the attendants.
7. The theory of PSC and its model are suitable to studying physical health and safety status of workers in a core discipline like OHS.

**Recommendations**

These recommendations are outlined based on the findings:

1. The senior management of the OMCs and their fuel stations need to prioritise health and safety of their attendants. Management commitment and priority given to health and safety should be demonstrated in their ability to formulate appropriate workplace safety policies, laying down adequate working procedures and practices. At the same time, it is vital for management to provide workers with good and sufficient PPE and enforce the operation of

necessary policies and regulations at the worksites. They must do these until safety becomes an integral part of the daily working procedures of their workplalces.

2. Management needs to provide strong leadership in safety participation and use bottom-up and/or horizontal approach in all matters concerning the health and safety of the attendants in Accra. It is important for managers actively involve in organising periodic safety meetings and attend such meetings themselves. At these meetings, managers need to provide up-to-date safety information to the workers and invite them to make active contributions. Moreover, managers need to obey and periorically review all safety policies and regulations and provide logistical support for their implementation. Further, management needs to generate most of these working ideas and activities from the workers but not "top decisions" that are expected to be complied by the employees without their inputs. This encourages workers to own the decisions and make them work to the benefits of themselves and their organisations.
3. The senior managers of OMCs need to do periodic test and provide both psychological and physical health and safety interventions to these attendants, especially the companies of Allied and Shell. Medical and psychological screening before and periodically on the job is paramount to detect existing and precondition signs and symptoms of health and safety challenges of the workers. Interventions such as sending some of the workers to hospital for medical and psychological attention would be based on the screening activities. Other interventions may include providing on-site health promotion intervention like stress management and coping strategies,

workplace and home conflict management, nutrition and exercise, prevention of injuries, first aid strategies, alcohol and other drugs usage.

4. The supervisors are encouraged to increase their support for the attendants. Attendants are also entreated to provide the necessary help to each other while at work. Supervisors are the closest management staff and serve as the liaison officers between the senior managers and the workers. Therefore, supervisors should be concerned about the welfare of the workers, listen to them, help them as they work and be the unifier by successfully bringing all the attendants to work together peacefully. The act of workers actively helping each other reduces the burden of job demands and promotes work cohesion. These promote the sense of well-being among the workers.
5. It is important that the companies and their fuel station managers reschedule shifts to make working hours shorter than they are now. Rescheduling of the shift to 12-hour daily is likely to reduce the rate of injury, psycho-emotional stress, chronic fatigue and other ill health conditions among the workers. A schedule like this provides only one shift through a night and for a week. This rotates after a week for attendants on night shift previously going for day and vice versa. This prevents all the shifts from going through constant night shifts which come with sleep deficits and its health and safety implications. Besides, it affords the previous night shift workers to recover a whole week before going through again.
6. Station managers need to employ more attendants to lessen the burden of workload. Moreover, proper training before and on-the-job is essential to help the attendants cope with the stress and exhaustions associated with their jobs.

## Recommendations for Further Studies

These further study areas are also proposed:

1. There is the need to explore the PSC and how it influences the health and safety of attendants of various fuel stations in the whole nation of Ghana.
2. A longitudinal study is required to explore changes in health and safety of the fuel station attendants as PSC, job resources and job demands change over time.

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# APPENDICES

## APPENDIX A

## UNIVERSITY OF CAPE COAST

## COLLEGE OF EDUCATION STUDIES

## DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION

## QUESTIONNAIRE FOR FUEL ATTENDANTS

**Dear Attendant**

I am Edward Wilson Ansah, a PhD (Health Promotion; Environmental and Occupational Health) candidate at the Department of HPER, UCC. I am contacting you to participate in this academic research study: "**Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana."** This research aims to assess the psychosocial safety climate at the fuel service stations and how it relates to the health and safety of the attendants. Your participation in this study requires that you complete a 51 item survey. This may take between 25 to 30 minutes of your time. You were selected among a poll of participants and your responses will be analyzed as a group. Your participation in this study is completely voluntary and you are free to even stop answering the items should you find it necessary. Apart from your time, you are assured this study poses no harm to you, your station or company. By taking part in this study, you are helping to find credible ways of protecting the health and safety of yourself and other attendants in the industry. No information that will identify you is required. If you fully understand your duties and agree to take part in this research, please sign in the space below.

Signature……

Date……

For any information contact my supervisors **Prof. J. K. Ogah (0243102322) or Prof. J. K. Mintah (0202464739).**

You may also contact me (Edward) on **0247703379** or edward.ansah@ucc.edu.gh

Thank you for your participation.

**SECTION A: Please mark [√] the box corresponding to your choice concerning each statement below.**

1. Gender: a. Male [ ]

   b. Female [ ]

2. How old are you?.....

3. Indicate your highest educational level

   a. No Formal Education [ ]

   b. Basic Education [ ]

   c. Vocational Training [ ]

   d. Secondary Education [ ]

   e. Tertiary Education [ ]

4. What is marital status?

   a. Single, never married [ ]

   b. Married and living with spouse [ ]

   c. Married but not living with spouse [ ]

   d. Divorced [ ]

5. Which of these companies do you work with?

   a. Total Oil [ ]

   b. Shell Ghana [ ]

   c. GOIL [ ]

   d. Allied Oil [ ]

6. How long have you been working in filling station?……..

7. Which section of the station do you work?

   a. Forecourt [ ]

   b. Shop [ ]

   c. Lube bay [ ]

8. Which of these accidents have you experienced at your station? (Select as many as apply)

   a. None [ ]

   b. Fire [ ]

   c. Armed robbery [ ]

   d. Major oil spillage [ ]

   e. Vehicle accident [ ]

   f. Customer abuse [ ]

   g. Other (specify) ……..

9. During the past one year till today, have you suffered any bodily injury at work?

   a. Yes [ ]

   b. No [ ]

10. Please indicate the type of shift you run in your station

   a. 8-houra day [ ]

   b. 12-hour a day [ ]

   c. Night only [ ]

   d. 24-hour [ ]

   e. 3-days [ ]

   f. Other (specify)……

**SECTION B: Please circle the letter that best corresponds to your choice concerning each statement below. Note: Past 4 weeks means 4 weeks ago.**

11. Overall, how would you rate your health during the past 4 weeks?

**a.** Very Poor **b.** Poor **c.** Fair **d.** Good **e.** Very Good **f.** Excellent

12. During the past 4 weeks, how much did physical health problems limit your usual physical activities other than work?

**a.** Not at all **b.** Very little **c.** A little **d.** Quite a lot **e.** I could not do physical activities

13. During the past 4 weeks, how much difficulty did you have doing your daily work at home or at work, because of your physical health?

**a.** None at all **b.** A little bit **c.** Some **d.** Quite a lot **e.** I could not do daily work

14. How much bodily pain have you had during the past 4 weeks?

**a.** None **b.** Very mild **c.** Mild **d.** Severe **e.** Very severe

15. During the past 4 weeks, how much did bodily injury prevent you from working normally?

**a.** None **b.** Very mild **c.** Mild **d.** Severe **e.** Very severe

16. During the past 4 weeks, how much energy did you have?

**a.** Very much **b.** Quite a lot **c.** Some **d.** A little **e.** None

17. During the past 4 weeks, how much did your physical health problems limit your usual social activities with family or friends?

**a.** Not at all **b.** Very little **c.** A little **d.** Quite a lot **e.** Could not do social activities

18. During the past 4 weeks, how much have you been limited from daily work because of injuries?

**a.** Not at all **b.** Slightly **c.** Moderately **d.** Quite a lot **e.** Extremely

19. During the past 4 weeks, how much did personal or emotional problems keep you from doing your usual work?

a. Not at all **b.** Very little **c.** A little **d.** Quite a lot **e.** Could not do daily activities

**SECTION C: Please answer with the best option provided by marking [√] the column that most accurately represents your opinion. There is no 'correct' or 'wrong' answer.**

| | | **Strongly Agree (SA)** | **Agree (A)** | **Disagree (D)** | **Strongly Disagree (SD)** |
|---|---|---|---|---|---|
| 20 | In my workplace senior management acts quickly to correct problems that affect the health and safety of the workers. | | | | |
| 21 | Senior management acts decisively when a concern about a worker's health status is raised. | | | | |
| 22 | Senior management show support for stress prevention through involvement and commitment towards workers' health matters. | | | | |
| 23 | The well-being of staff is a priority for my company. | | | | |
| 24 | Senior management in this company clearly considers the health and safety of workers to be of great importance. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 25 | Senior management considers workers' health and safety to be as important as productivity. | | | | |
| 26 | There is good communication in this company about health and safety problems which affect me or other workers. | | | | |
| 27 | Information about workplace well-being is always brought to my attention by my manager or supervisor. | | | | |
| 28 | Management listens to my contributions to resolve health and safety problems in this station or company. | | | | |
| 29 | Consultation in health and safety occurs with all the workers. | | | | |
| 30 | Management encourages workers to be involved in health and safety matters. | | | | |
| 31 | In my company, the prevention of stress involves all levels of the workers. | | | | |
| 32 | My supervisor is concerned about the welfare of those who work under him or her. | | | | |
| 33 | My supervisor pays attention to what I say. | | | | |
| 34 | My supervisor is helpful in getting the job done. | | | | |
| 35 | My supervisor is successful in getting people to work together. | | | | |
| 36 | People I work with are competent in doing their jobs. | | | | |
| 37 | People I work with take a personal interest in me. | | | | |
| 38 | People I work with are friendly. | | | | |
| 39 | My colleagues will help me when I need them. | | | | |
| 40 | My job demands working very fast all the time. | | | | |
| 41 | My job demands hard work all the time. | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 42 | I am faced with conflicting job demands at work all the time. | | | | |
| 43 | My job requires an intense concentration all the time. | | | | |
| 44 | My job is always interrupted with other tasks all the time. | | | | |
| 45 | I am faced with difficult jobs at work all the time. | | | | |
| 46 | I have to wait for others to complete my job all the time. | | | | |
| 47 | My job requires lots of physical effort. | | | | |
| 48 | My job requires moving heavy load. | | | | |
| 49 | My job requires rapid physical activity. | | | | |
| 50 | My job requires working fast. | | | | |
| 51 | My job requires no excessive work. | | | | |

# APPENDIX B

# ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 03321-33172/3 / 0207355653/ 0244207814
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/A/2016/152
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0009096

C/O Directorate of Research, Innovation and Consultancy

21ST JUNE, 2017

Mr. Edward Wilson Ansah
Department of Health, Physical Education and Recration
University of Cape Coast

Dear Mr. Ansah,

**ETHICAL CLEARANCE –ID :( UCCIRB/CES/2016/03)**

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for the implementation of your research protocol titled **' Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana.'**

This approval requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST
Date:.....

Samuel Asiedu Owusu
**Administrator**

# APPENDIX C

# INTRODUCTORY LETTER


**UNIVERSITY OF CAPE COAST**
COLLEGE OF EDUCATION STUDIES
*Department of Health, Physical Education & Recreation*

TELEPHONE +233 - (0)206610931 / (0)543021384 / (0)268392819

Cables & Telegrams:
UNIVERSITY, CAPE COAST


Our Ref: **ED/HTP/14/0006/17**

22nd February, 2016

The CEO/Managing Director
Allied Oil Company Ltd
Accra

**INTRODUCTORY LETTER: EDWARD WILSON ANSAH (ED/HTP/14/0006)**

The bearer of this letter is a PhD student of the above-named department. In partial fulfilment of the requirements for the programme, he is conducting a research on the topic **"Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana"** and would need permission from your outfit to enable him collect data at your fuel station. Be assured that the information collected will be treated with utmost confidentiality.

We would therefore be most grateful if he could be given approval to conduct the research.

We count on your usual co-operation.

Thank you.

Prof. Joseph K. Mintah
**Head**

# UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

*Department of Health, Physical Education & Recreation*

TELEPHONE: +233 - (0)206610931 / (0)543021384 / (0)268392819

Cables & Telegrams:
UNIVERSITY, CAPE COAST


Our Ref: **ED/HTP/14/0006/16**

22nd February, 2016

The CEO/Managing Director
Ghana Oil Company Ltd
Accra

**INTRODUCTORY LETTER: EDWARD WILSON ANSAH (ED/HTP/14/0006)**

The bearer of this letter is a PhD student of the above-named department. In partial fulfilment of the requirements for the programme, he is conducting a research on the topic **"Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana"** and would need permission from your outfit to enable him collect data at your fuel station. Be assured that the information collected will be treated with utmost confidentiality.

We would therefore be most grateful if he could be given approval to conduct the research.

We count on your usual co-operation.

Thank you.

Prof. Joseph K. Mintah
**Head**

# UNIVERSITY OF CAPE COAST

## COLLEGE OF EDUCATION STUDIES

***Department of Health, Physical Education & Recreation***

TELEPHONE: +233 - (0)206610931 / (0)543021384 / (0)268392819

Our Ref: **ED/HTP/14/0006/14**

Cables & Telegrams:
UNIVERSITY, CAPE COAST

22nd February, 2016

The CEO/Managing Director
Shell Ghana Ltd
Accra

**INTRODUCTORY LETTER: EDWARD WILSON ANSAH (ED/HTP/14/0006)**

The bearer of this letter is a PhD student of the above-named department. In partial fulfilment of the requirements for the programme, he is conducting a research on the topic **"Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana"** and would need permission from your outfit to enable him collect data at your fuel station. Be assured that the information collected will be treated with utmost confidentiality.

We would therefore be most grateful if he could be given approval to conduct the research.

We count on your usual co-operation.

Thank you.

Prof. Joseph K. Mintah
**Head**

# UNIVERSITY OF CAPE COAST

COLLEGE OF EDUCATION STUDIES

*Department of Health, Physical Education & Recreation*

TELEPHONE: +233 - (0)206610931 / (0)543021384 / (0)268392819


Our Ref: **ED/HTP/14/0006/15**


Cables & Telegrams:
UNIVERSITY, CAPE COAST


22nd February, 2016

The CEO/Managing Director
Total Oil Ghana Company Ltd
Accra

**INTRODUCTORY LETTER: EDWARD WILSON ANSAH (ED/HTP/14/0006)**

The bearer of this letter is a PhD student of the above-named department. In partial fulfilment of the requirements for the programme, he is conducting a research on the topic **"Psychosocial Safety Climate as Predictor of Occupational Health and Safety of Fuel Station Attendants in Accra, Ghana"** and would need permission from your outfit to enable him collect data at your fuel station. Be assured that the information collected will be treated with utmost confidentiality.

We would therefore be most grateful if he could be given approval to conduct the research.

We count on your usual co-operation.

Thank you.

Prof. Joseph K. Mintah
**Head**