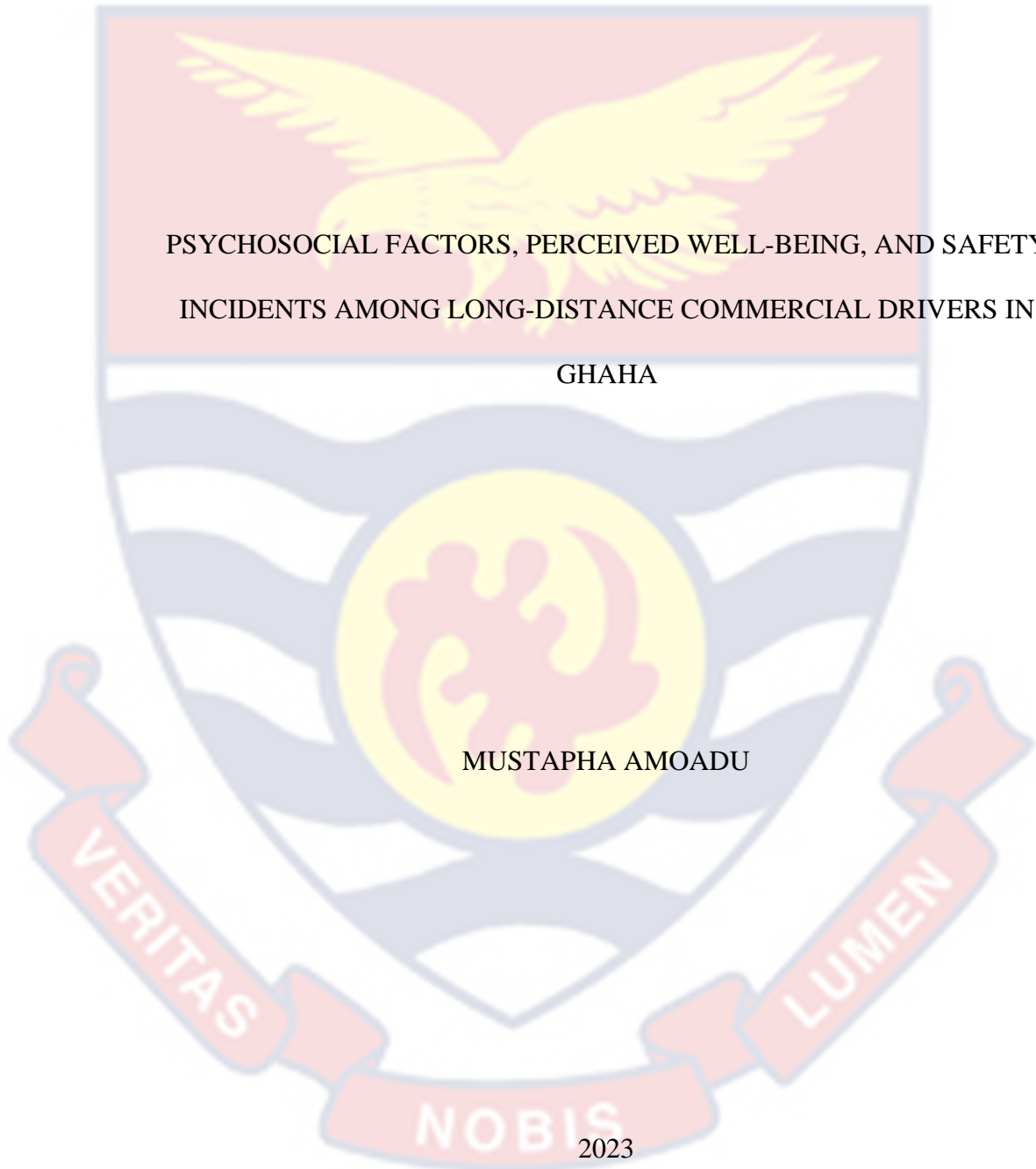


UNIVERSITY OF CAPE COAST



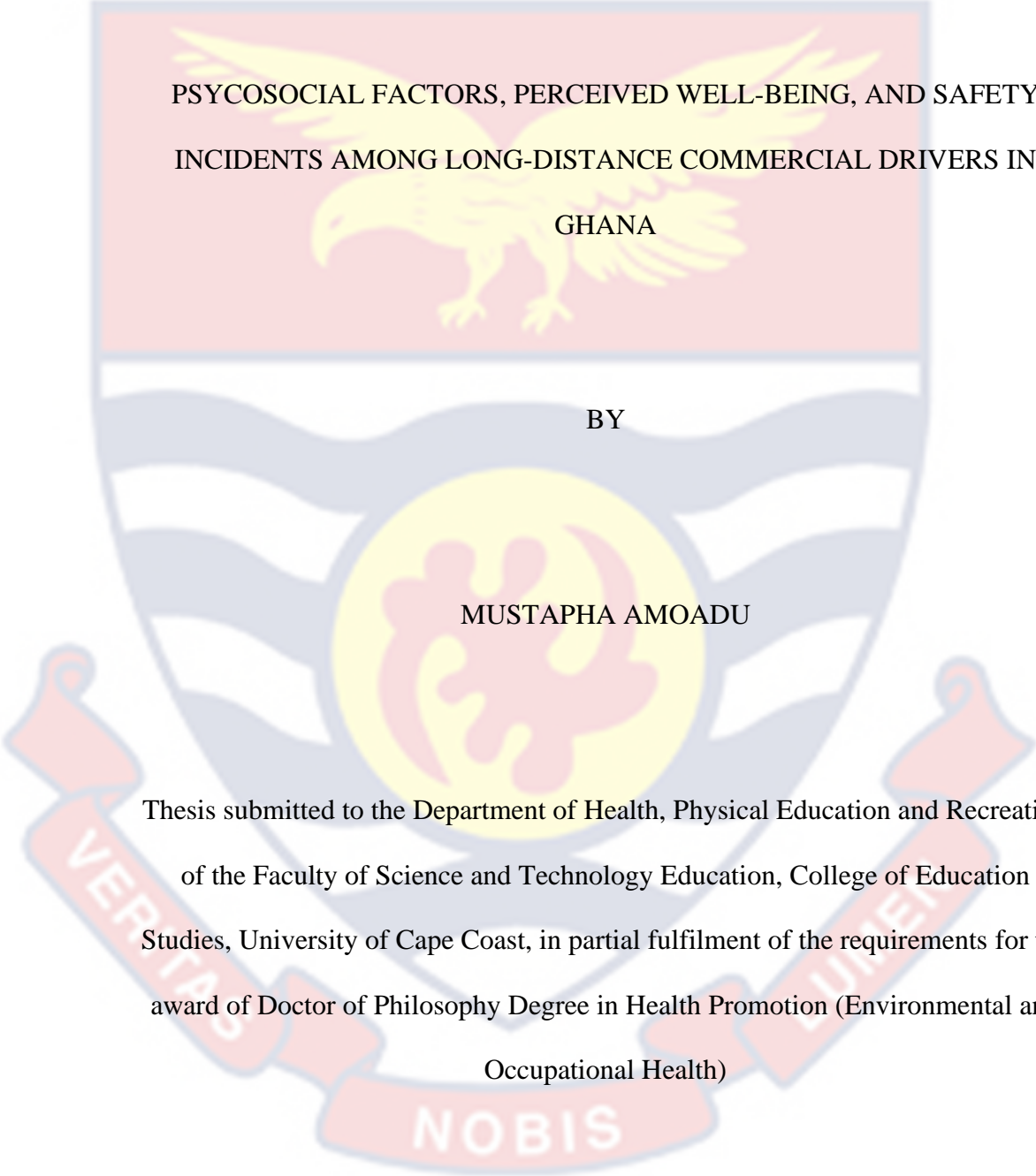


©2023

Mustapha Amodu

University of Cape Coast

UNIVERSITY OF CAPE COAST



PSYCOSOCIAL FACTORS, PERCEIVED WELL-BEING, AND SAFETY
INCIDENTS AMONG LONG-DISTANCE COMMERCIAL DRIVERS IN
GHANA

BY

MUSTAPHA AMOADU

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

March 2023

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.

Candidate's Signature: Date:

Name: Mustapha Amodu

Supervisors' Declaration

We hereby declare that the preparation and presentation of the 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: Dr. Edward Wilson Ansah

Co-Supervisor's Signature: Date:

Name: Dr. Jacob Owusu Sarfo

ABSTRACT

This study aimed at exploring the levels of psychosocial hazards and the paths through which these factors predict perceived psychological well-being and safety incidents of long-distance bus drivers. A quantitative survey design was used to purposively and conveniently select 7,315 long-distance bus drivers who commute 140 km from Accra and Tema to other parts of the country and the neighbouring countries. A questionnaire was used for data collection. Kruskal Wallis H test, confirmatory composite analysis, and path analysis using partial least square structural equation modelling were used for data analysis. The results indicated high levels of psychosocial hazards (long driving hours, high job demand, low job resources, work-family conflict, lone driving, job insecurity and poor psychosocial safety climate) among long-distance bus drivers. Also, drivers who drive more than 41 hours a week were more likely to report high safety incidents. High driving-hour intensity was observed among drivers whose buses are individually owned. Job demand, job resources and psychosocial safety climate are significant direct predictors of perceived psychological well-being and safety incidents. Perceived psychological well-being partially mediated the effect of job demands and resources on safety incidents. Psychosocial safety climate also buffered the effect of job demands and resources on psychological well-being and the effect of psychological well-being on safety incidents. Efforts are needed to manage the psychosocial work factors of long-distance bus drivers and there should be a strict enforcement and integration of occupational health and safety standards in the road transport industry in Ghana.

KEY WORDS

Psychosocial work factors

Long-distance bus drivers

Psychological well-being

Psychosocial safety climate (PSC)

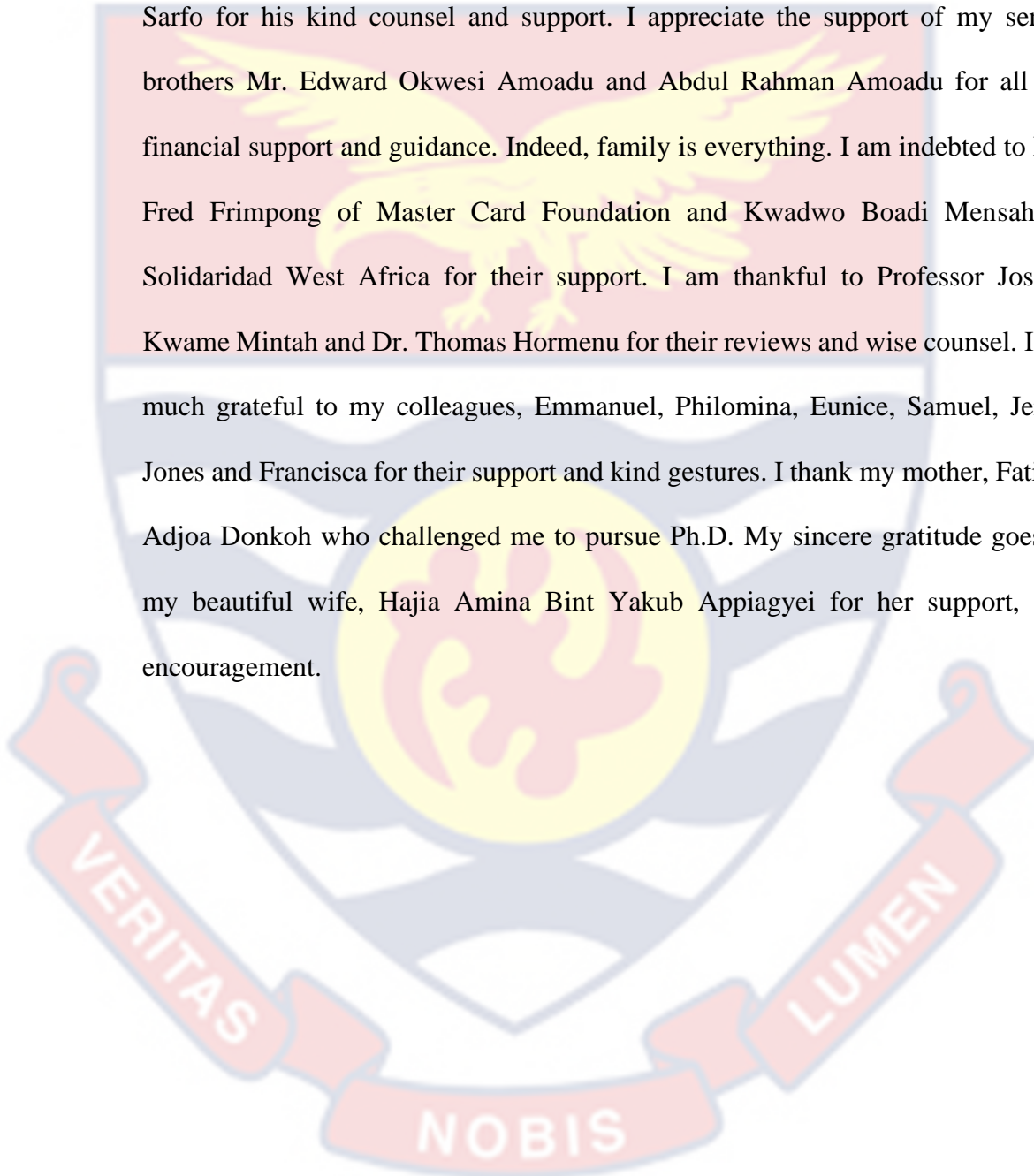
Safety incidents

Ghana



ACKNOWLEDGEMENTS

I am indebted to Dr. Edward Willson Ansah for his enormous support, guidance, and mentorship throughout my doctoral journey. I am grateful to Dr. Jacob Owusu Sarfo for his kind counsel and support. I appreciate the support of my senior brothers Mr. Edward Okwesi Amoadu and Abdul Rahman Amoadu for all the financial support and guidance. Indeed, family is everything. I am indebted to Mr. Fred Frimpong of Master Card Foundation and Kwadwo Boadi Mensah of Solidaridad West Africa for their support. I am thankful to Professor Joseph Kwame Mintah and Dr. Thomas Hormenu for their reviews and wise counsel. I am much grateful to my colleagues, Emmanuel, Philomina, Eunice, Samuel, Jerry, Jones and Francisca for their support and kind gestures. I thank my mother, Fatima Adjoa Donkoh who challenged me to pursue Ph.D. My sincere gratitude goes to my beautiful wife, Hajia Amina Bint Yakub Appiagyei for her support, and encouragement.



DEDICATION

To the blessed memory of my late father, Mohammed Kobina Amodu.



TABLE OF CONTENTS

DECLARATION	ii
ABSTRACT	iii
KEY WORDS	iv
ACKNOWLEDGEMENTS	v
DEDICATION	vi
LIST OF TABLES	xi
LIST OF FIGURES	xiii
LIST OF ACRONYMS	xv
CHAPTER ONE:	1
INTRODUCTION	1
Background to the Study	1
Statement of the Problem	8
Purpose of the Study	11
Research Questions	11
Significance of the Study	12
Delimitation	12
Limitations	13
Definition of Terms	14
Organisation of the Study	17
CHAPTER TWO:	18
REVIEW OF RELATED LITERATURE	18
Concept of Occupational Health and Safety	19

Prevalence of Occupational Injury, Disease and Deaths	23
Ghana Statistics on Occupational Injuries, Diseases and Deaths	27
Response to Occupational Health and Safety Issues	29
Overview of Ghana's Road Transport Sector	34
Psychosocial Work Factors in the Road Transport Sector	38
Road Transport Injuries, Diseases and Deaths Statistics	41
Theories of Psychosocial Work Factors	50
Relationship among Job Demands, Well-being and Job Performance	57
Relationship among Job Resources, Well-being and Job Performance	65
Relationship among PSC, Well-being and Job Performance	73
Conceptual Framework	80
Summary	84
CHAPTER THREE:	87
RESEARCH METHODS	87
Research Design	87
Study Area	90
Population	92
Sampling Procedure	94
Data Collection Instrument	97
Data Collection Procedures	105
Data Processing and Analysis	107

CHAPTER FOUR:	118
RESULTS AND DISCUSSION	118
Research Question 1: What is the Level of Psychosocial Hazards Confronting Long-Distance Commercial Drivers in Ghana?	118
Research Question 2: What is the Difference in Safety Incidents According to Weekly Hours of Driving Intensity among Long-Distance Commercial Drivers in Ghana?	127
Research Question 3: What is the Difference in Weekly Driving Hour Intensity According to Bus Ownership among Long-distance Commercial Drivers in Ghana?	131
Research Question 4: What is the Extent to which Job Demands, Job Resources and PSC Predict Psychological Well-being and Safety Incidents of Long-distance Commercial Drivers in Ghana?	133
Research Question 5: What is the Extent to which Psychological Well-being Mediates the Effect of Job Demand and Job Resources on Safety Incidents among Long-distance Commercial Drivers in Ghana?	146
Research Question 6: To What Extent does PSC Moderate the Influence of Job Demands and Job Resources on Psychological Well-being and Safety Incidents among Long-distance Commercial Drivers in Ghana?	156
CHAPTER FIVE:	169
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	169
Summary	169
Main Findings	171
Conclusions	172

Recommendations 173

Suggestions for Future Studies 175

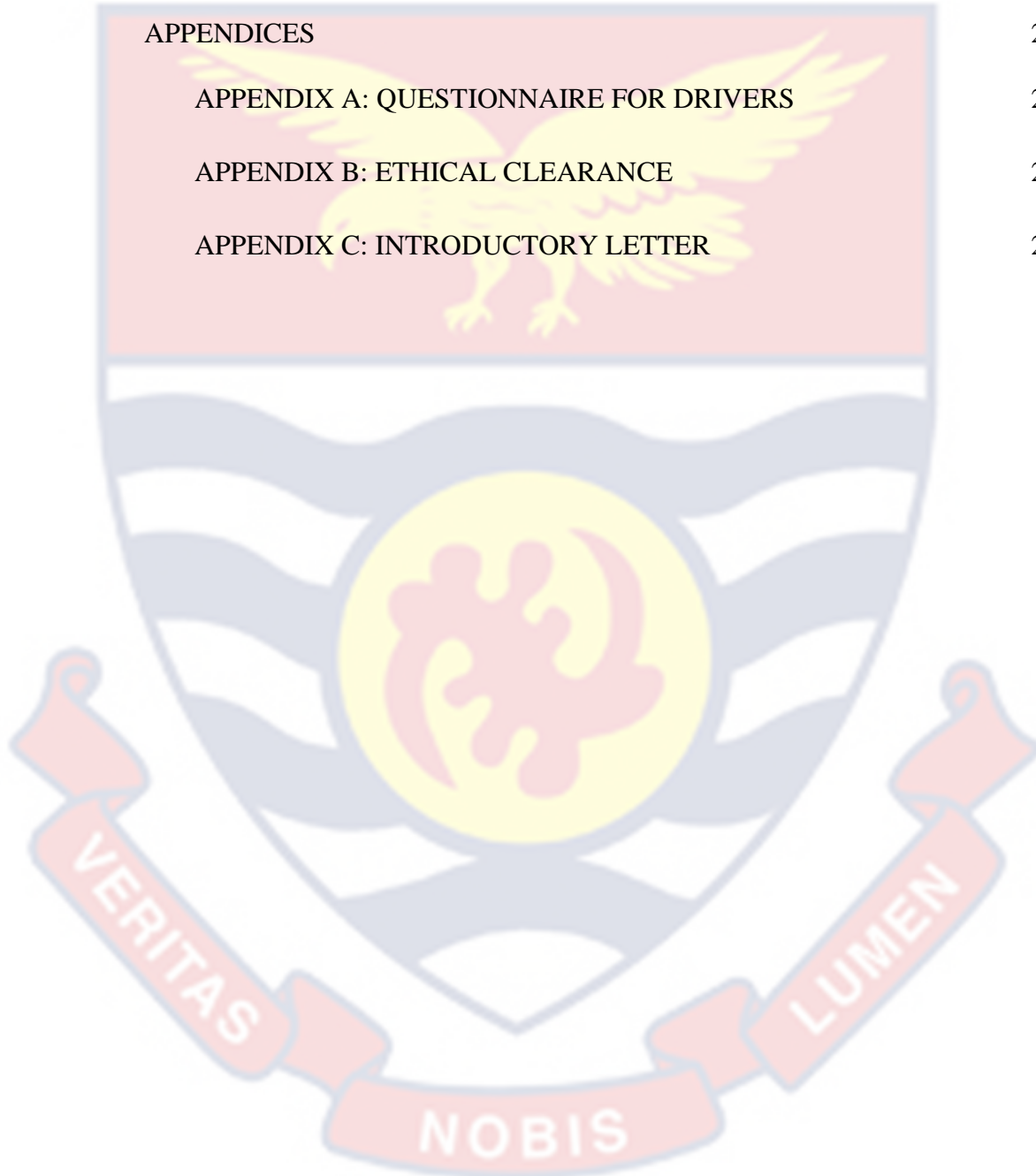
REFERENCES 177

APPENDICES 217

APPENDIX A: QUESTIONNAIRE FOR DRIVERS 218

APPENDIX B: ETHICAL CLEARANCE 224

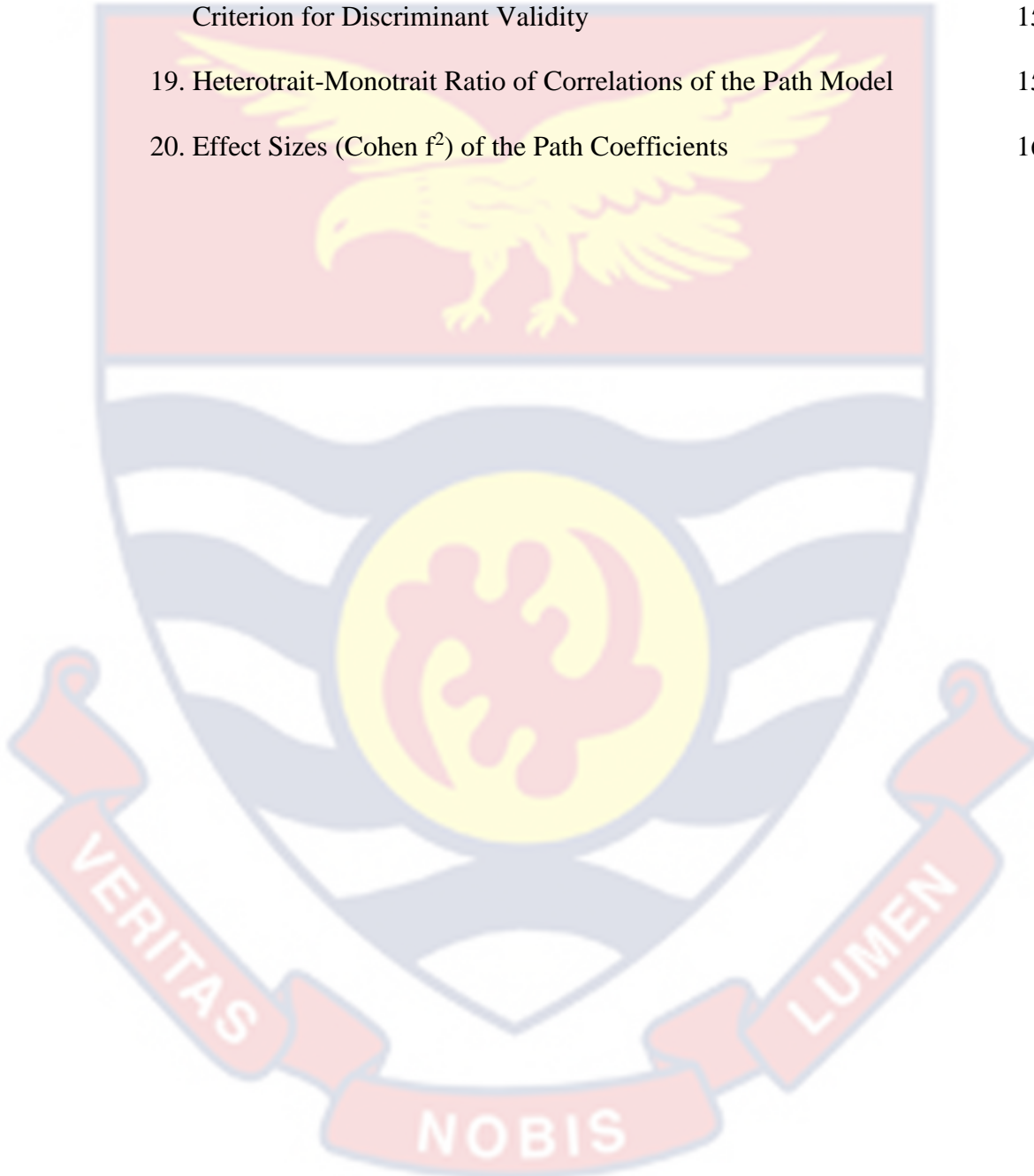
APPENDIX C: INTRODUCTORY LETTER 225



LIST OF TABLES

Table	Page
1. Average Variance Extracted (AVE) of Constructs	101
2. Fornell and Larcker's (1981) Criterion for Discriminant validity	102
3. Heterotrait-Monotrait Ratio of Correlations of Constructs	103
4. Item Listings, Cronbach's Alpha (α), Composite reliability (CR) and Outer Loadings for Five Constructs; JD, JR, PSC, PWB and SI	104
5. Levels of Psychosocial Hazards among Long-distance Commercial Drivers in Ghana (sample =7,315)	119
6. Kruskal-Wallis H Test Results for Safety Incidents by Categories of Weekly Driving Hour Intensity	128
7. Kruskal-Wallis H Test Results for Weekly Driving Hour by Categories of Bus Ownership	131
8. Item Listings, CR, AVE, and Outer Loadings for Five Constructs; JD, JR, PSC, PWB and SI	135
9. Fornell and Larcker's (1981) Criterion for Discriminant Validity of the Path Model	136
10. Heterotrait-monotrait Ratio of Correlations of the Path Model	136
11. Collinearity Statistics (VIF) of the Path Model	136
12. Effect Sizes (Cohen f^2) of the Path Coefficients	141
13. Item Listings, CR, AVE and Outer Loadings for Five Constructs; JD, JR, PWB and SI	148
14. Fornell and Larcker's (1981) Criterion for Discriminant Validity	149
15. Heterotrait-Monotrait Ratio of Correlations of the Mediation Model	149

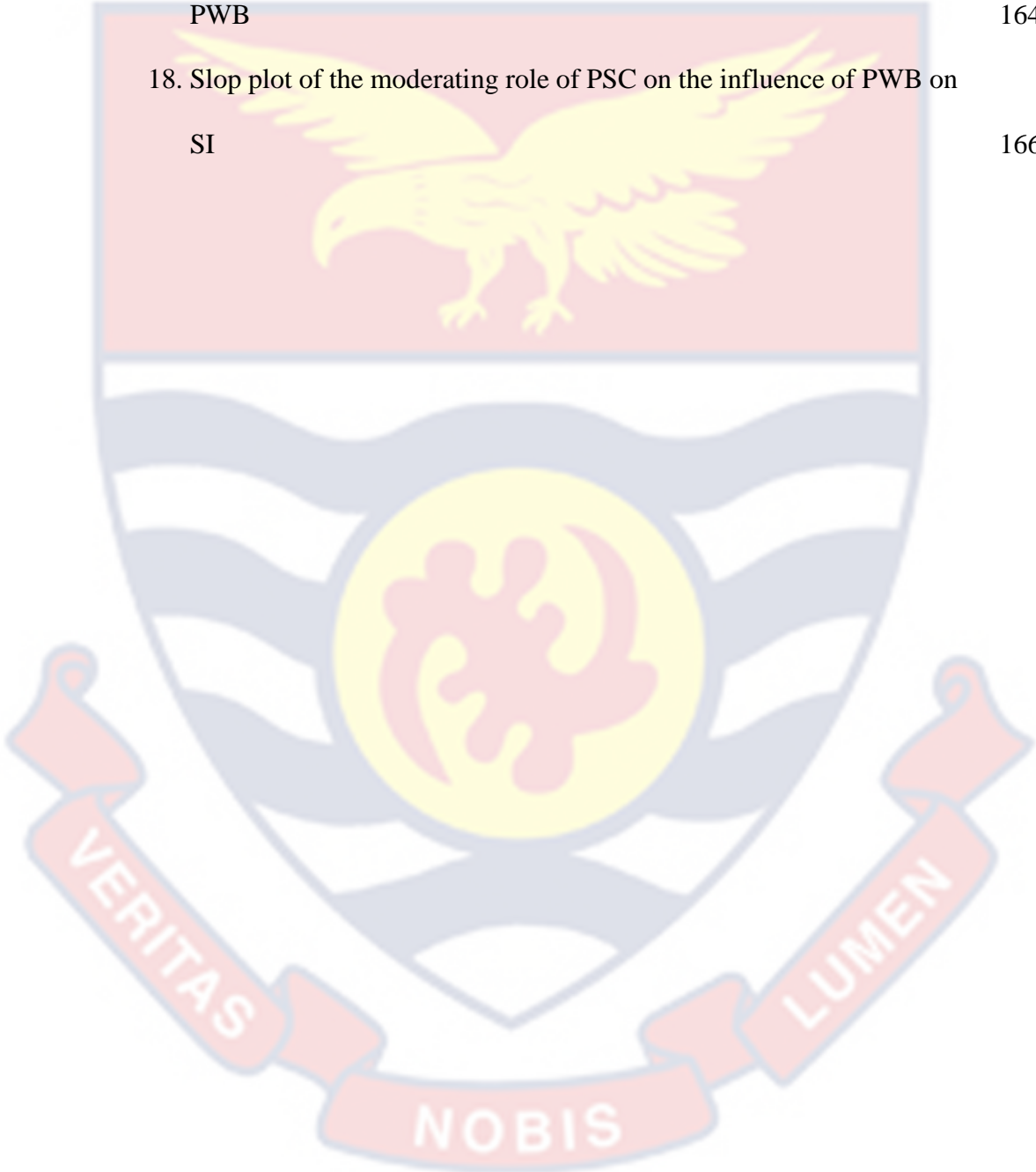
16. Collinearity Statistics (VIF) for the Mediation Model	149
17. Mediation Effect of PWB on the Effect of JD and JR on SI	150
18. Average Variance Extracted (AVE) and Fornell and Larcker's (1981) Criterion for Discriminant Validity	157
19. Heterotrait-Monotrait Ratio of Correlations of the Path Model	158
20. Effect Sizes (Cohen f^2) of the Path Coefficients	161



LIST OF FIGURES

Figure	Page
1. PSC model of work stress (Dollard & McTernan, 2011)	56
2. Conceptual framework of the effect of psychosocial work factors on PWB and SI	81
3. Ghana map showing major transport routes	93
4. The power of JD, JR and PSC predicting PWB and SI	110
5. The mediating role of PWB on the effect of JD and JR on SI	113
6. Moderating effect of PSC on the effect of JD on PWB	114
7. The moderating role of PSC on the effect of JR on PWB	116
8. The moderating role of PSC on the effect of PWB on SI	117
9. PLS-SEM reflective model predicting PWB and SI from JD, JR and PSC	138
10. Summary results of the bootstrapping procedure showing significance of the path coefficients	139
11. Summary results of the bootstrapping procedure predicting PWB and SI from JD, JR and PSC	140
12. PLS-SEM reflective model predicting PWB and SI from JD and JR	151
13. Summary results of the bootstrapping procedure predicting PWB and SI from JD and JR	152
14. Interaction term created using the two-stage approach in smart PLS-SEM	159
15. Summary results of the bootstrapping procedure for the moderating effect of PSC on the paths JD→PWB, JR→PWB and PWB→SI	160

16. Slope plot of the moderating role of PSC on the influence of JD on PWB	162
17. Slope plot of the moderating role of PSC on the influence of JR on PWB	164
18. Slope plot of the moderating role of PSC on the influence of PWB on SI	166



LIST OF ACRONYMS

AVE	Average Variance Extracted
BC	Before Christ
BIAJ	Brief Index of Affective Job Satisfaction
CR	Composite Reliability
DALY	Disability Adjusted Life Years
DASS	Depression, Anxiety and Stress Scale
DBQ	Driver Behaviour Questionnaire
GDP	Gross Domestic Product
DV	Dependent Variable
DVLA	Driver and Vehicle Licensing Authority
ERI	Efforts-Rewards Imbalance
GHA	Ghana Highway Authority
GHQ-12	General Health Questionnaire
GPRTU	Ghana Private and Road Transport Union
HSP	Health and Safety Professionals
HTMT	Heterotrait-Monotrait Ratio of Correlation
ILO	International Labour Organisation
IOHA	International Occupational Hygiene Association
IV	Independent Variable
JCQ	Job Content Questionnaire
JD	Job Demand
JD-R	Job Demand-Resource
JR	Job Resources

KM	Kilometers
LI	Legislative Instrument
LMIC	Low-and Middle-Income Country
MMDA	Metropolitan, Municipal and District Assembly
MMT	Metro Mass Transport
MSD	Musculoskeletal Disorders
MTTD	Motor Transport and Traffic Division
NRSC	National Road Safety Commission
OHS	Occupational Health and Safety
PLS-SEM	Partial Least Squares Structural Equation Modelling
PNDC	Provisional National Defense Council
PPE	Personal Protective Equipment
PROTOA	Progressive Owners Transport Association
PSC	Psychosocial Safety Climate
PWB	Psychological Well-being
PWI-A	Personal Well-being Index-Adult
SDGs	Sustainable Development Goals
SI	Safety Incidents
SRMR	Standardised Root Mean Square Residual
STC	State Transport Corporation
UK	United Kingdom
UN	United Nations
UNICEF	United Nations International Children's Emergency Fund
UNITC	United Nations Inland Transport Committee

US United States

VIF Variance Inflation Factor

WHO World Health Organisation



CHAPTER ONE

INTRODUCTION

Background to the Study

Every year, road traffic crashes claim millions of lives worldwide, and the impact of these crashes is particularly pronounced among commercial bus drivers, especially in Ghana (Sam, Daniels, Brijs, Brijs, & Wets, 2018). Safety incidents which include risk-driving behaviours, have not only emerged as a global public health concern but have also become a national crisis within the Ghanaian context (Boateng, 2020). Long-distance drivers in Ghana face a myriad of psychosocial work challenges and stressors, from grueling work schedules and demanding job conditions to the strain on their physical and mental well-being (Boateng, 2021).

Psychosocial work factors refer to the interaction among job design or content, work environment, organisational conditions, and employees' capabilities. This interaction can greatly affect worker behaviour, health and safety, job satisfaction, and work performance (Useche, Montoro, Alonso, & Pastor, 2019). If they are not adequately managed, psychosocial work variables can constitute a hazard for employees by resulting in near misses, accidents, physical injuries and psychological dysfunctions among employees (Useche, Cendales, Montoro, & Esteban, 2018). Therefore, there is a need for appropriate provisions that attend to workplace health and safety issues, including psychosocial work variables. The development and promotion of a safe psychosocial work environment which promotes and protects employees' health and safety and boosts productivity is the core function of occupational health and safety [OHS] (Lee, 2018). Thus, employers need to pay close attention to the organisational psychosocial factors to construct a conducive work environment that is safe for their workers (Peters et al.,

2021). It is believed that employers who value the well-being of their employees create a safe work environment and provide appropriate resources and a social climate that encourage productivity (Yulta, Idris & Dollard, 2016).

Research evidence indicates that there exist inherent and unhealthy psychosocial work factors among commercial drivers (Hege, Lemke, Apostolopoulos, & Sönmez, 2018). Such factors may include job strain, time pressure, long and irregular work schedules, job insecurity, poor remuneration, strict external control by owners, and considerable low decision latitude (Hege et al., 2018). Numerous professional drivers regularly confront these psychosocial factors, which pose substantial on-road risks and have consequences for the health and safety of both the driver and other road users (Alonso, Esteban, Sanmartín, & Useche, 2017). Furthermore, evidence suggests that adverse psychosocial factors at work such as time pressure, long hours of driving, shift work, monotonous tasks, and ergonomic issues, increase commercial drivers' risk of engaging in on-the-road risky behaviours which may lead to serious road traffic crashes, resulting in injuries and fatalities (Gómez-Ortiz, Cendales, Useche, & Bocarejo, 2018).

Road traffic accidents continue to claim numerous lives, wreak havoc on property, and result in significant economic losses. Thus, reducing these accidents and attendant consequences and meeting Sustainable Development Goals (SDGs) target 3.6 need more pragmatic evidence-based interventions. The World Health Organisation (WHO, 2018) has estimated that about 1,350,000 people die every year from road traffic accidents globally. Furthermore, globally, about 50 million people suffer various degrees of injuries yearly as a result of road crashes (WHO, 2021a). Again, WHO (2018) reported that children and young people between ages five and 29 years and people from poor socio-economic backgrounds are more

vulnerable to road traffic accidents. In addition, estimated figures showed that between 2015 and 2030, fatal and non-fatal road accident injuries will cost the global economy approximately 1.8 trillion dollars (Chen, Kuhn, Prettnner, & Bloom, 2019).

Road crash figures are alarming, and the disproportionate costs are pervasive. The WHO (2018) report indicates that countries with low-income levels experience the worst forms of road traffic accidents. About 60 per cent of global registered vehicles are found in low- and middle-income countries (LMIC) but accounted for 93 per cent of the world's road traffic deaths. Additionally, high-income countries have an average of 8.2 deaths per 100,000 people in road traffic accidents, while it is 27.5 death per 100,000 people in LMIC; the ratio is over three folds. Also, in LMICs, the proportion of accident victims who die before reaching the hospital is more than twice of that in high-income countries. This situation might be a result of disparities in health system infrastructure and poor post-accident response. The report further revealed that low-income countries had not reduced road traffic accident deaths since 2013. This placed Africa's road transportation as the world's deadliest (Deme, 2019). For example, Africa has the highest rate of road traffic accident fatalities with 26.6 deaths per 100,000 people (WHO, 2018).

Ghana's roads are among the deadliest in Africa (Yobo, 2014). For example, from 1991 to 2014, public buses alone constituted approximately 24 per cent of vehicles involved in road crashes, accounting for 36 per cent of road traffic fatalities in Ghana (Sam et al, 2018). Again, for every long-distance commercial bus driver who died in road traffic accident in Ghana, at least three or more other people were killed in the same accident (Ojo, Agyemang, & Afukaar, 2018).

Therefore, it is reasonable to devote research attention to OHS in the transportation industry, particularly among commercial drivers. Effective management and integration of health and safety practices in Ghana's road transport industry can help reduce the number of accidents, fatalities, injuries and their economic headaches on Ghana's roads.

The high number of deaths and injuries associated with road traffic accidents in Ghana comes with a high economic burden. Report shows that over 230 million dollars are spent annually on road traffic accidents and about 1.7 per cent of Ghana's gross domestic product (GDP) is lost to road traffic collisions (Blankson & Lartey, 2020). Despite this significant financial burden, about half of road traffic-related injuries and deaths happen to individuals in their prime productive years, between 15 and 44 years (Ossei, Agagli, Ayibor, Niako, & Asante, 2019). Many of these accidents are attributable to driver behaviours and other work and on-the-road psychosocial factors.

Professional drivers are likely to become fatigued because of the high job demands associated with driving (Tàpia-Caballero, Serrano-Fernández, Boada-Cuerva, Sora, & Boada-Grau, 2021). Evidence shows that driver fatigue is among the leading causes of fatalities in the transport industry (Alonso, Esteban, Gonzalez-Marin, Alfaro, & Useche, 2020). Despite the high demands of professional driving, particularly for commercial drivers, this occupational group typically takes short breaks, resulting in accumulated fatigue (Useche et al., 2019), which predisposes drivers to occupational diseases and safety incidents (Alonso, Esteban, Useche, López de Cózar, & Useche, 2016). Furthermore, evidence shows that commercial drivers, especially bus drivers, are vulnerable to experiencing hypertension, musculoskeletal disorders, eye problems, sleep problems, metabolic disorders,

anxiety, and depressive disorders (Useche et al., 2019). These occupational diseases potentially result in job loss, presenteeism, absenteeism, sick leave, disability, low productivity, and accidents involving all cadre of population.

Drivers may experience a poor psychosocial climate at work due to low job control and strict external control from employers. These conditions may exacerbate stress that is strongly linked to risky road behaviours among commercial drivers (Montoro, Useche, Alonso, & Cendales, 2018). Research has also shown that commercial drivers are frequently exposed to work stress because of high job expectations but limited control, leading to occupational accidents, injuries, and fatalities (Useche, Alonso, Cendales, Autukevi, & Serge, 2017). This is because stress impairs driving performance and increases risky driving behaviours through errors and violation of road traffic regulations, which make commercial drivers more vulnerable to road accidents (Useche et al., 2018). In a working environment characterised by work stress and fatigue, occupational burnout is also common, and has been linked to the well-being of road transport drivers (Cendales, Alonso, & Serge, 2017; Molina-Hernández, Fernández-Estevan, Montero, & González-García, 2021). These workplace conditions demand that social support is provided from employers, supervisors and co-workers, but that seems unavailable to commercial drivers (Useche et al., 2018).

Given the harmful working conditions of commercial drivers in developing countries, interventions that focus on altering their psychosocial working conditions to promote and protect the health and safety of these drivers are understudied (Ali, Ahsan, Uddin & Hossain, 2021; Peters et al., 2021). Furthermore, it is evident that developed countries have made significant progress in the field of OHS, enabling them to conduct research and implement interventions

aimed at enhancing the well-being and safety of their workforce. However, such advancements are often lacking in developing economies (Peters et al., 2021). For instance, Europe and other high-income countries are experiencing a significant reduction in occupational traffic accidents due to robust regulations, policies, research, and improvements in OHS prevention based on contemporary evidence (Llamazares, Useche, Montoro & Alonso, 2021; Useche, Alonso, Cendales, & Llamazares, 2021). However, the situation in developing countries may get worse because many young people are entering the commercial transport sector with less driving experience (Boateng, 2020).

A large percentage of people seeking jobs as drivers in Ghana's commercial transportation sector are young people who have little or no formal education (Boateng, 2020). This situation puts car owners and transport companies in a position to exploit these job seekers with unrealistic daily or weekly sales targets (Dotse, Nicolson, & Rowe, 2019). Unfortunately, commercial driving work in Ghana is characterised by poor remuneration, job insecurity, high job demands, strict control from vehicle owners, low decision and skill discretion, fierce competition to make daily sales and poor protection of labour rights (Boateng, 2021). Boateng further revealed that certain bribe-taking and unethical road safety enforcement personnel increase the stress level of drivers by extorting money from them. Boateng again asserted that these circumstances and conditions force commercial drivers to work long hours and engage in perilous behaviours such as over-speeding, overloading, etc. on the road in order to meet employment contract expectations, pay off assistance, and bribe law enforcement agents on the road.

Despite these precarious workplace psychosocial hazards affecting commercial drivers in Ghana, policies on road safety still target drivers' risky

behaviours and ignore the unhealthy working conditions under which drivers work (Boateng, 2021). Thus, much attention is not being paid to commercial drivers' psychosocial working conditions, probably because Ghana has not prioritised workplace well-being and safety for its workers. For example, Amponsah-Tawiah and Dartey-Baah (2011) observed that there is a lack of comprehensive OHS policy and adequate expertise to ensure that workers across the economy in Ghana are working in a healthy and safe work environment. This means that contemporary occupational hazards including psychosocial workplace hazards are likely to go undetected and unresolved in most industries in Ghana because of the fragmented legal requirements and legislations concerning OHS in Ghana and unclear responsibilities and accountabilities of employers (Annan, Addai, & Tulashie, 2015). Therefore, there is an urgent need for contemporary and evidence-based OHS measures to safeguard the protection and promotion of the well-being and safety of commercial drivers and other road users in the country.

While the grim reality of road accidents and safety incidents among long-distance commercial drivers in Ghana underscores the urgency of this study, it is within the intricate web of psychosocial work factors that we find a compelling avenue for investigation. As Boateng (2021) has illuminated, the lives of these drivers are shaped by various psychosocial work factors such as strain, time pressure, job insecurity, and more all of which resonate with the psychosocial variables central to this study. However, what sets this study apart is the emphasis on perceived psychological well-being as a pivotal mediator in this equation. The perceptions of well-being, intricately linked with the demands and resources inherent in their jobs, play a fundamental role in mediating how psychosocial work factors influence safety incidents. It is through this lens of perceived psychological

well-being that the researcher aims to unravel the complex relationship between the work environment and the safety of long-distance drivers in Ghana, forging a path towards enhancing their overall well-being and reducing safety incidents on the roads.

Empirical evidence indicates that interventions to promote the well-being and safety of commercial drivers in Ghana's road transport industry focused on drivers' safety practices, with less emphasis placed on the environmental and organisational factors that often lead to unsafe driving behaviours (Atombo, Wu, Tettehfiio, Nyamuame, & Agbo, 2017). According to Atombo et al. (2017), stakeholders in the road transport sector understand the benefits of OHS regarding commercial transport. However, OHS is not well integrated into the activities of road transport to help reduce accident fatalities. In addition, Atombo et al. (2017) stated that interventions that focus on designing a healthy working environment, management priority and commitment to the safety and perceived psychological well-being of drivers are lacking. Finally, Atombo et al. (2017) opined that efforts are needed to fully integrate safety culture in the road transport industry to improve drivers' safety and health performance. Thus, psychosocial safety climate (PSC) becomes one of the key safety climate interventions and theories that seek to develop a safe working environment and improve management priority and commitment to the psychological well-being and safety in this modern era.

Statement of the Problem

Workplace deaths and injuries, including road traffic crashes, are reduced in industrialised countries because of prudent regulations, policies, robust interventions, and investment in OHS (Montoro et al., 2018). However, in developing nations like Ghana, OHS is still in its infancy (Amponsah-Tawiah &

Mensah, 2016), and road transport accidents, casualties, and injuries are common and difficult to manage; they are increasing. This is because minimising the frequency of workplace accidents, injuries, and deaths hugely relies on existing evidence regarding the underlying causal factors and dynamics of the work environment. This may be difficult for professionals in road safety in Ghana because of limited evidence about the working conditions associated with professional drivers' well-being and safety incidents. This lack of focus creates a substantial problem for intervention strategies, policy development, and scientific understanding of driver psychological well-being and safety incidents within the road transport industry in Ghana, hindering the industry's progress toward enhanced safety and sustainability.

There have been few studies that have focused on the physical and the psychosocial working conditions of workers in Ghana, but they are predominantly among fuel station attendants in the oil industry (Ansah & Mintah, 2012; Ansah & Mensah, 2020; Monney, Dramani, Aruna, Tenkorang, & Osei-Poku, 2015). Unfortunately, even among these studies, only Ansah, Mintah and Ogah (2018) and Ansah and Mensah (2020) explored psychosocial safety climate factors at work that affect the well-being and safety of workers in the oil industry. Furthermore, other psychosocial work conditions such as job insecurity, work-family balance, and time intensity have not been studied in Ghana, and these factors may be prevalent among commercial drivers given the precarious nature of their working conditions in Ghana (Boateng, 2021). In addition, none of the studies on psychosocial work factors conducted in Ghana investigated how these organisational factors affect workers' perceived psychological well-being and safety incidents. For example, Ansah and Mensah (2020) predicted health and safety using psychosocial work

factors; however, health and safety were measured as a single construct. Looking at the increase in road accidents and associated factors in Ghana, psychosocial work issues related to well-being and safety incidents among commercial drivers need to receive significant research attention. This research gap poses a significant problem in the road transport industry by limiting a comprehensive scientific understanding of the challenges faced by these professionals.

Evidence has shown that commercial transport drivers in Ghana operate in a precarious psychosocial work environment (Boateng, 2021), which is unhealthy and predisposes the drivers to fatigue and work stress that are strongly associated with risky driving behaviours, occupational accidents, injuries, and fatalities (Useche et al., 2019). Thus, Nilsson, Griggs, McCollum and Stevance (2018) have argued that for countries, including Ghana, to attain SDG 8.8 by 2030, then all employees, especially those in precarious employment and women as well as migrants, should have their labour rights protected and a safe and secure work environment promoted. Therefore, the psychosocial work factors and the environment under which workers, especially commercial drivers, operate must be given the needed consideration.

Unfortunately, Ghana failed to reduce road crash deaths by fifty per cent in 2020 as stated in SDG target 3.6 (Agenda for International Development, 2019). According to the MTTD, Ghana recorded about 2,589 fatalities in road crashes in 2020. Also, Ghana's mortality caused by road traffic accidents was 25.7 deaths per 100,000 people in 2019, one of the highest in Africa. This means that efforts directed at improving road safety in Ghana have not yielded desirable results because most road safety measures have focused on countermeasures aimed at correcting drivers' risky behaviours (Boateng, 2021). The approach is not only

narrow but also ignores the psychosocial conditions under which professional drivers, especially commercial drivers work. For Ghana to achieve SDG 11.2 target which pursues access to safe, affordable, and sustainable transport systems for everyone and to improve safety on our roads by the year 2030, much attention needs to be given to psychosocial work factors of commercial drivers through cutting-edge research to inform policies and strategies.

Purpose of the Study

The purposes of the study were to: (1) explore the psychosocial hazards and the path through which psychosocial factors predict perceived psychological well-being (PWB) and safety incidents (SI); (2) examine the effect of weekly hour driving intensity on SI; (3) explore the effect of bus ownership on IS; (4) examine the mediating role of PWB on the effect of job demands and resources on SI; and (5) examine the moderating role of psychosocial safety climate (PSC) on the influence of job demands and job resources on PWB and SI among long-distance bus drivers.

Research Questions

The study addressed the following research questions:

1. What is the level of psychosocial hazards confronting long-distance commercial drivers in Ghana?
2. What is the difference in safety incidents according to weekly hour of driving intensity among long-distance commercial drivers in Ghana?
3. What is the difference in weekly driving hour intensity according to bus ownership among long-distance commercial drivers in Ghana?

4. What is the extent to which job demand, job resources and PSC predict psychological well-being and safety incidents of long-distance commercial drivers in Ghana?
5. What is the extent to which psychological well-being mediates the effect of job demand and job resources on safety incidents among long-distance commercial drivers in Ghana?
6. To what extent does PSC moderate the influence of job demand and job resources on psychological well-being and safety incidents among long-distance commercial drivers in Ghana?

Significance of the Study

The findings give a better understanding of the psychosocial working circumstances of long-distance drivers in Ghana's transportation business. The findings serve as a guide to developing specialised occupational policies for road safety in Ghana. Furthermore, the findings are useful to commercial driver unions and associations, transportation companies, vehicle owners, the National Road Safety Commission, the Ministry of Transportation, and other stakeholders in developing policies to design a safe and healthy working environment for commercial drivers. Also, the findings serve as evidence for reference for advocacy on the benefits and essence of a comprehensive national OHS policy for the road transport sector. Moreover, evidence from this research can be used as a monitoring and diagnostic tool for the assessment of the psychosocial working conditions of long-distance drivers in Ghana.

Delimitation

This study was delimited to using a descriptive survey design to examine the relationships among psychosocial factors (job demand, job resources and

psychosocial safety climate), perceived psychological well-being and safety incidents (errors and violations). The study was also delimited to using only a questionnaire as a data collection instrument. Furthermore, the study was delimited to only long-distance commercial bus drivers of a minibus and long bus who commute from Accra and Tema to other parts of the country and the sub-region. Finally, the study was delimited to long-distance commercial bus drivers whose vehicles are owned or are members of a transport union such as Ghana Private Road Transport Union (GPRTU), Progressive Owners Transport Association (PROTOA), and drivers who work for Metro Mass Transit Limited (MMT) as well as State Transport Company Limited (STC).

Limitations

The findings and conclusions drawn from this study cannot be considered the absolute truth of psychosocial work factors. This implies that the generalisation drawn from the findings is limited to the long-distance bus drivers that commute from Accra and Tema to other parts of the country and the sub-region. Perhaps, the use of purposive and convenient sampling techniques in selecting only bus drivers may not reflect the true representation of long-distance bus drivers that commute from Accra and Tema to other parts of the country and the sub-region. Moreover, the perception and characteristics of only long-distance bus drivers who commute from Accra and Tema cannot represent the characteristics and perceptions of long-distance bus drivers in Ghana. In addition, the correlations between psychosocial factors and occupational health outcomes (psychological well-being and safety incidents) found in this study do not imply causation. However, the use of a large sample size, thus, about 67 per cent of the target population implies that at least the findings and conclusions drawn from the sample can be generalised to the target

population. Furthermore, the use of mature, reliable and valid measures and application of robust statistical analytical procedures indicate that the findings, conclusions and recommendations from this study can help design effective interventions to promote and protect the health and safety of long-distance bus drivers in Ghana.

Definition of Terms

Commercial driver: A professional driver licensed to operate vehicles classified as commercial vehicles to commute goods and passengers.

Hazards: Any source such as a situation, condition, environment, etc. that has the potential of causing damage, harm, or adverse health effects to someone or something (Canadian Centre for Occupational Health and Safety, 2021a).

Individual bus owner: Refers to a scenario where a person owns and operates one or more buses independently. In individual bus ownership, the owner has direct and complete control over all aspects of the bus operation, including routes, schedules, maintenance, and hiring of drivers. Drivers of whose buses are under this ownership operate in the transport yards managed by the assemblies through station masters and GPRTU and PROTOA.

Long-distance bus driver: A professional bus driver who commutes at least 140 kilometers or drives more than 3 hours on a single trip on standard routes.

Long-distance commercial driver: Refers to commercial drivers who drive for 140 kilometers or more than 3 hours for a single trip.

Perceived well-being: Refers to one's perception of the combination of feeling good and functioning well and the feeling of positive emotions as well as the development of one's potentials or capacities, having control over one's life and experiencing good social relationships (Huppert, 2009). Well-being

includes psychological, social, physical, environmental and workplace or employee well-being.

Private bus company: Refers to bus transportation services provided by a privately owned and operated registered company. These companies can vary in size, ranging from small family-owned businesses to large corporations. While the company's owners or shareholders have ultimate control, the operation of the business is often delegated to a management team or board of directors. Decision-making involves multiple stakeholders. Private owned transport companies include VIP Jeoun, VVIP, 2M Express, Francol transport services limited, etc. This bus ownership structure operates their private transport yards.

Psychological well-being: This refers to drivers' perception of their mental and emotional state, life satisfaction and psychological balance.

Psychosocial safety climate: Refers to the extent to which the management of an organisation makes the psychological well-being of employees their priority (Dollard, Dormann, & Idris, 2019). It refers to the perception of workers regarding management commitment, priority, participation and involvement in issues related to stress prevention and the promotion of the psychological health of workers (Dollard et al., 2019; Yulita, Idris, & Dollard, 2016).

Psychosocial work factors: Refer to factors related to work design, organisation, management and social context at work that may result in adverse psychological, physical and social outcomes such as burnout, fatigue, stress, and depression (European Agency for Safety and Health at work, 2021; Iavicoli, Cesana, Dollard, Leka, & Sauter, 2015). Factors such as workload,

job demands, job role, job security, job strain, social support, bullying, harassment, violence, communication, rewards, safety, climate, etc. are psychosocial factors at work (Iavicoli et al., 2015).

Public bus company: Public bus companies are owned and operated by government entities or public authorities. They are publicly owned and funded. Public bus companies are subject to government oversight and management. Decision-making authority is vested in government officials, transportation departments, or appointed boards. There are two public bus companies in Ghana: Metro Mass Transit and State Transport Company.

These bus companies operate their transport yards or terminals

Risk: The possibility or chance that a person or something will be harmed or experience an adverse health effect if exposed to a hazard (Canadian Centre for Occupational Health and Safety, 2021a).

Road traffic accident: Refers to accidents that occur on a way or street open to public traffic which resulted in one or more persons being killed or injured and, at least, one moving vehicle involved (Organisation for Economic Co-operation and Development [OECD], 2021). Road traffic accident involves collision between vehicles, between vehicles and pedestrians and between vehicles and animals or fixed obstacles (OECD, 2021).

Safety incidents: Refer to occurrence conditions or situations arising in the course of work that resulted or could have resulted in injuries, illness, damage to health, or fatalities (Canadian Centre for Occupational Health and Safety, 2021b). In this study, safety incidents are risk-driving behaviours in the forms of driving errors and violations.

Organisation of the Study

This study is presented in five chapters: chapters one, two, three, four and five. Chapter one presents the background of the study, statement of the problem, purpose of the study, research questions, significance of the study, delimitations, limitations and definition of terms. Chapter two focuses on the review of related literature that centered on the concept of OHS, OHS issues in Ghana, the concept of transportation in Ghana, road traffic accidents and road safety interventions in Ghana and psychosocial factors affecting drivers. Chapter two further looks at two theoretical models, the Job-demand-control theory and Psychosocial safety climate theory and provides a conceptual framework for the study. Chapter three, the research methods chapter, includes study design, study area, population, sampling procedure, data collection instrument, data collection procedures, and data processing and analysis. Chapter four presents the results and the discussion while Chapter five focuses on the summary, main findings, conclusions, and recommendations.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The purposes of the study were to: (1) explore the psychosocial hazards and the path through which psychosocial factors predict psychological well-being (PWB) and safety incidents (SI); (2) examine the effect of weekly hour driving intensity on SI; (3) explore the effect of bus ownership on IS; (4) examine the mediating role of PWB on the effect of job demands on SI; and (5) examine the moderating role of PSC on the influence of job demands and job resources on PWB and SI among long-distance bus drivers. This chapter presents a review of related literature that guides the study. The review of related literature is organised under the following sections and headings:

1. Concept of Occupational Health and Safety
2. Prevalence of Occupational Injuries, Diseases and Deaths
3. Response to Occupational Health and Safety Issues
4. Overview of Ghana's Road Transport Sector
5. Psychosocial Work Factors in the Road Transport Sector
6. Road Transport Occupational Injuries, Diseases and Deaths
7. Response to Occupational Health and Safety Issues in the Road Transport Sector
8. Theories of Psychosocial Work Factors
9. Relationship among Job Demands, Well-being and Job Performance
10. Relationship among Job Resources, Well-being and Job Performance
11. Relationship among PSC, Well-being and Job Performance
12. Conceptual Framework
13. Summary

Concept of Occupational Health and Safety

The evolution of OHS can be dated back to 3000 BC when the Egyptians drafted the first aid manual for workers when they became aware of the dangers of gold and silver fumes (Reese, 2018). Workers' health and safety became an essential occupational concept in the Middle Ages (Reese, 2018). They became aware of the relationship between the illness and injuries they sustained and the kind of work they were performing. Reese further revealed that OHS gained much prominence during the advent of the industrial revolution (Reese, 2018). The advent of the industrial revolution changed the work environment because machinery became more common. Work demands increased and workers were made to work for long hours under pressure (Reese, 2017). Despite the high job demands, workers lacked the skills and knowledge to effectively operate the machines, resulting in high occupational injuries, illness, and deaths (Reese, 2018). As a result of these occupational injuries, diseases and deaths, worker and labour unions began to mount pressure on employers and governments to institute measures to promote and protect the health and safety of workers (Reese, 2017).

Occupational health and safety as a discipline would be needless if workplaces are free of hazards. Industries and businesses exist primarily to provide goods and services. However, the procedures, inputs and outputs of these industries and businesses generate a lot of hazards and every entity has its unique hazard or set of hazards; no work environment is free of hazards (Lee, 2018; Reese, 2018). Hazards are crucial elements of OHS because they pose significant health and safety risks to workers. These hazards and the risks may result in near misses, accidents, injuries, illness, and deaths (Wong & Chan, 2018). These workplace incidents are critical OHS issues because they affect not only the workers but also

the organisation, their families, communities, and society (Lee, 2018). Therefore, in the modern workplace, protecting and promoting workers' health and safety is not just an OHS issue but a public health, human rights issue and a business case (Driscoll et al., 2020; Ladou, London, & Watterson, 2018; Ponsonby, 2017).

According to the International Labour Organisation (ILO, 2019a), OHS is a discipline that deals with preventing work-related incidents, accidents, injuries, illnesses and deaths, and promoting of workers' health. Thus, OHS aims to promote and improve working conditions and the work environment for all concerned (Rantanen, Muchiri, & Lehtinen, 2020). Creating a healthy and safe work environment is multi-disciplinary. Therefore, members of different professions must develop a decent workplace for all workers. As a result, OHS encompasses several disciplines and actions of occupational medicine, nursing, occupational or industrial psychologists, industrial ergonomics, occupational hygienists, physiotherapists, managers, researchers, etc. (Jilcha & Kitaw, 2017; WHO, 2021b).

Occupational health and safety has also been described by the International Occupational Hygiene Association (IOHA, 2021) as a science of anticipation, identification, evaluation and controlling of hazards at the workplace to protect and promote the mental health and well-being of workers, the community and the larger society. This definition means that OHS does not only focus on physical health but it also protects and promotes optimum mental health and well-being of workers in all occupations and work settings (Wong & Chan, 2018). Wong and Chan (2018) further explained that poor mental health of workers might result from physical health problems. Perhaps, people with physical health problems are more likely to suffer from mental health issues such as depression and distress (Wong & Chan, 2018). This argument is logical because modern OHS places a premium on

promoting workers' health and well-being by protecting them from psychosocial hazards (Driscoll et al., 2020).

Furthermore, the definition by IOHA showed that OHS does not only focus on workers but their families, communities and the society in which businesses operate (IOHA, 2021). Because industries do not function in a vacuum, OHS seizes the opportunity to prevent and protect families and communities from hazards caused by industry and business operations, procedures, and outcomes. Thus, OHS includes critical opportunities for the general population by addressing health, safety and well-being issues affecting people in a specific environment. Perhaps, this allows the introduction of OHS policies and practices to individuals. These policies and practices may not only be useful at the workplace but also in their daily lives. Moreover, occupational injuries, diseases and deaths do not affect only workers and their families but have a huge cost burden on society through lost or reduced productivity and increased use of medical facilities (Reese, 2018). The modern-day concept of OHS considers the impact of health and safety at work and other aspects of workers' lives (Lund, Alferts, & Santana, 2016). Therefore, OHS is not restricted to formal organisations or the population employed in the formal sector but considers the informal sector too and the consequences of unemployment on the well-being of the general population (ILO, 2019a; Rantanen et al., 2020).

Occupational health and safety demands have been growing steadily globally because of the persistent change in society which also reflects changes at the workplace. For instance, advancement in technology, restructuring of labour markets, climate change, globalisation, economic instability, socio-economic and demographic changes in the workforce are variables that increase demand and offer challenges for OHS to respond effectively (Min et al., 2019; Sorensen et al., 2021).

The world is now in the fourth industrial revolution, and industrial developments are always followed by changes or evolution in OHS (Badri, Boudreau-Trudel, & Souissi, 2018). Hence, reacting to the industrial revolution and changes in working conditions provide challenges for developing and implementing effective, reliable and sustainable OHS solutions and policies to ensure continuous protection and promotion of workers' health and safety (Badri et al., 2018).

The provision of a healthy, decent and safe work environment for workers is a primary responsibility of the top management of companies or businesses (Amponsah-Tawiah, Ntow, & Mensah, 2016). However, employees or workers also have the virtuous right to make sure they are safe and healthy while discharging their duties as expected of them. The basics of ensuring safety at work are through top management commitment, support, priority and value for workers' health and safety (Dollard et al., 2019). Thus, top management need to ensure effective communication between management and workers as well as optimum participation and involvement of workers at all levels of the organisation in addressing work-related safety issues (Dollard et al., 2019; Wilton, McLinton, & Dollard, 2019). Moreover, evidence has shown that leadership commitment, participation, policies, comprehensive and collaborative strategies, and compliance with legislation, standards, ethics, regulations and evidence-based practice are the best practices for protecting and promoting the safety, health and well-being of workers (Sorensen et al., 2021, 2018).

At the workplace, safety measures are preventive and protective strategies within and outside the work environment that protect workers from exposure or occupational hazards (Amfo-Otu & Agyemang, 2016). Workplace safety measures include hazards identification and risk assessment, controls and enforcement as

well as instituting and enforcing safety policies and standards (Amfo-Otu & Agyemang, 2016; Salaudeen, Durowade, Yusuf, & Adeyemi, 2019; Simpeh & Amoah, 2021). Controls are methods to eliminate or reduce hazards identified (Asumeng, Afful, & Badu-Agyemang, 2015; Ingram et al., 2021; Rout & Sikdar, 2017). Elimination or substitution methods are adopted as controls when hazards identified at the workplace can effectively be eliminated or replaced with less hazardous ones (Rout & Sikdar, 2017). Where hazards identified are impossible to be eliminated, engineering controls, administrative controls and personal protective equipment (PPE) are adopted to reduce the hazards at the workplace (Asumeng et al., 2015; Rout & Sikdar, 2017).

Each risk factor or hazard has its own set of preventive controls. For instance, preventing excessive working hours may require agreement between the employer and the employee on healthy maximum working time. Also, some psychosocial hazards can be eliminated through work patterns and system changes. Safety measures adopted may be organisational policy or industry best practices, legislation, standards and regulations. These safety measures are comprehensive, complementary and interrelated rather than isolated. Thus, safety measures are worthless without proper monitoring, communication, training, education, and strict enforcement and management.

Prevalence of Occupational Injury, Disease and Deaths

Every work environment contains some hazards. A hazardous workplace or environment exposes workers to occupational injuries, illness and fatalities caused by biological, physical, chemical, psychological and ergonomic agents (Peters et al., 2021). Any wound or damage to a body part resulting from a work-related accident is considered an occupational injury. A health condition or disorder

acquired from continuous exposure to a hazardous work environment is called occupational illness or disease. Occupational injuries and illnesses affect workers and place a strain on healthcare systems, reduce productivity, and negatively influence household income (WHO & ILO, 2021). At the workplace, occupational injuries and illness affect productivity through absenteeism, presenteeism, reduced working capacity, lost work hours, and reduced morale (Adei, Braimah, & Mensah, 2019; Salaudeen et al., 2019). Besides, occupational injuries and illness are considerable cost to the worker, employer and government as a result of compensation claims and other claims based on damages.

Evidence has shown that between 1.8 and 6.0 per cent of the global GDP is lost to occupational injuries and diseases (Takala et al., 2014). In addition, Safe Work Australia (2015) revealed that 77, 18 and five per cent of costs related occupational injuries and diseases were footed by the employees, nation and employers, respectively. Furthermore, a study conducted in Ghana has revealed that 7.7 and 9.4 per cent of costs related to occupational injuries and diseases in the informal sector were footed by the employer and employee, respectively (Adei, Mensah, Agyemang-Duah, & KanKam, 2021). According to the evidence from Ghana and Australia, employers are more likely to bear the less direct cost of work-related injuries and diseases than workers or the state. Therefore, making the workplace safe, healthy and decent is a collective effort by global bodies, governments, worker unions, employers and employees.

Global estimates of occupational accidents, work-related illness and mortality have shown that about 2.78 million workers die each year (Hämäläinen, Takala, & Kiat, 2017). Thus, about 7,600 workers die globally each year from unhealthy and unsafe working conditions. Moreover, most of these occupational

deaths (86%) were caused by occupational diseases. The result is that globally, about 6,500 and 1,000 workers die daily from occupational diseases and injuries respectively.

Also, in a joint report by the WHO and ILO (2021) on the work-related burden of disease and injury from 2000 to 2016, occupational injuries and diseases were responsible for about 1.9 million deaths in 2016 globally, accounting for about 25.3 deaths per 100,000 population. The joint report revealed that 81% of these deaths were attributed to non-communicable diseases, with respiratory and cardiovascular diseases being the leading contributors. The report further revealed that occupational injuries contributed to 19 per cent of these occupational deaths. Also, evidence showed that the number of deaths caused by occupational illness or diseases are more than four times that of fatalities caused by occupational injuries globally (Chen et al., 2019; Rantanen et al., 2020; Rushton, 2017; WHO & ILO, 2021). These frightening premature deaths can be prevented with the right actions. These figures further show that more efforts are needed to ensure that everyone has a decent, healthy, and safer workplace.

According to the WHO and ILO (2021) joint report, key risk factors for these workplace injuries and illnesses include long working hours, workplace exposures such as air pollution, asthmagens, carcinogens and noise, occupational injuries and ergonomic factors. Among these risk factors, long working hours accounted for about 39.5 per cent of occupational deaths, followed by air pollution accounting for about 24 per cent of global occupational deaths in 2016. Besides, occupational injuries accounted for about 19 per cent of occupational deaths globally in 2016.

Occupational injuries and diseases also have the tendency to cause Disability Adjusted Life Years (DALY). The joint report by WHO and ILO (2021) further revealed that 89.72 million DALY were attributed to occupational risk factors in 2016 globally. Occupational injuries were the leading risk factor that accounted for 29.5 per cent of DALY in 2016. Exposure to long working hours and occupational ergonomic factors accounted for 25.9 and 13.7 per cent of DALY in 2016, respectively. Consequently, stroke (14%), musculoskeletal (13.7%) and cardiovascular diseases (12.1%) were the leading outcomes of work-related DALY globally in 2016 respectively. The report further revealed that between 2000 and 2016, there was a decrease of 14 per cent in work-related deaths. This points to the fact that there has been some improvement in occupational or workplace health and safety measures and policies. Despite this improvement in workplace health and safety measures, occupational deaths outnumber deaths due to tuberculosis as well as road traffic accidents combined (Rushton, 2017; WHO & ILO, 2021). However, the report revealed that between the same periods, cardiovascular diseases and stroke due to long working hours increased by 41 and 19 per cent, respectively. Perhaps, psychosocial risk factors at work are still posing a serious threat to the well-being of workers. Evidence from Global Burden of Disease research has also shown that between 1990 and 2016, only workers' exposure to asbestos had decreased but all other occupational factors including psychosocial work factors have increased by seven per cent (Driscoll et al., 2020).

Estimates recorded that in 2016, the African region recorded 150,426 occupational deaths, representing 14.9 deaths per 100,000 working population (WHO & ILO, 2021). Furthermore, Takala et al. (2017) reported that Africa records the highest global occupational communicable diseases of over one-third, having

the most serious work-related accidents of over 20 per cent. However, the region recorded less than 15 per cent of work-related cancers. According to the WHO and ILO (2021), some countries in Africa with high occupational deaths per 100,000 working population are Sierra Leone (23.3 deaths), Sudan (23.2 deaths), Madagascar (22.4 deaths), Cote d'Ivoire (21.7 deaths), Ethiopia (21.1 deaths), Tunisia (20.9 deaths) and Egypt (20.8 deaths). Though these figures were below the global rate of occupational deaths per 100,000 working population, it has been argued that the occupational deaths, injuries and disease data recorded are mainly from the formal sector due to lapses and challenges in data collection and reporting especially from the informal sector on the Africa continent (Hämäläinen et al., 2017; Takala et al., 2017). Meanwhile, evidence on the regional estimates and prevalence of occupational injuries, diseases and deaths is essential in designing effective policies and interventions in OHS to the local context (Takala et al., 2017).

Ghana Statistics on Occupational Injuries, Diseases and Deaths

Sustainable development goal (SDG) 8 aims to promote decent work as a way to ensure sustainable economic growth (Nilsson et al., 2018). Promoting decent work is a strategic way of addressing workplace hazards across all industries and businesses. As a global public health issue, occupational injuries are highly prevalent in developing countries or LMICs (Nakua et al., 2019). In an LMIC like Ghana, workplace safety is overlooked and, in some industries, compromised (Appiagyei, Nakua, Donkor, & Mock, 2021; Aram, 2021; Nakua et al., 2019). The substantial presence of the informal sector in the Ghanaian economy intensifies the severity of occupational accidents due to the sector's high rate of workplace injuries (Bonsu et al., 2020).

In 2014, a study revealed that Ghana has an estimated occupational accident of 15,702 per 100,000 working population across all industries with a fatality rate of 20.6 per 100,000 working population (Oppong, 2014). Again, in 2015, Ghana Statistical Service (GSS, 2015) revealed that 586,213 workers experienced occupational accidents in Ghana. The report further revealed that in 2015, Ghana recorded 63 injuries per 1,000 workers. In addition, GSS indicated that for every injury, an average of 16 working days were lost by the injured and only 7.5 per cent of workers who sustained injuries at the workplace reported the incident to their employers. Furthermore, the recent report by the WHO and ILO (2021) revealed that Ghana recorded 3,028 occupational deaths in 2016, representing 10.6 deaths per 100,000 population. In addition, the report revealed that Ghana recorded 201,021 DALYs, which represents 705.8 DALYs per 100,000 population. Perhaps, many of these figures are grossly underestimated, making occupational health and safety incidence in Ghana a serious concern.

A recent systematic review has revealed that in developing countries like Ghana, occupational injuries and deaths are usually caused by organisational factors such as lack of management or employers' interest in the health and safety of employees, long working hours, pressure at work and non-adherence to health and safety standards (Dodoo & Al-Samarraie, 2021). Moreover, occupational injuries, accidents and death issues become worse when there are no national OHS standards, policies and legislation as well as poor or lack of enforcement of safety standards (ILO, 2019a; Sorensen et al., 2021; Zwetsloot, Leka, & Kines, 2017). Perhaps, some occupational groups in Ghana are experiencing high occupational injuries, diseases, and deaths as a result of industry managers' and employers' failure or lack of commitment to prioritise workers' health and safety (Asumeng et

al., 2015). In addition, the high occupational injuries in Ghana may be due to precarious working conditions, the fragmented regulations and the lack of a national comprehensive OHS policy (Amponsah-Tawiah & Mensah, 2016).

Response to Occupational Health and Safety Issues

The global workforce is made up of 3.6 billion people which account for 63 per cent of the global population (Rantanen et al., 2020). Furthermore, the global workforce spends a total of one-third of their adult life at work and contributes to about 84.54 trillion dollars GDP (Statista, 2021). These workers do not only work to fend for themselves but contribute to the social and economic development and provide for their families, communities, nations, and the global society. Despite the changes the workplace has witnessed over the past centuries such as technological advancements, digitisation, globalisation and artificial intelligence, the human factor remains essential in breathing life into the work. Hence, there are viable reasons to promote and protect the working population.

Globally, the ILO in collaboration with the WHO and their collaborators and partners establish standards, best practices, pacts, conventions, guidelines, interventions and regulations through which the health and safety of workers are promoted and protected (ILO, 2019a; Rantanen et al., 2020). Thus, the ILO and WHO together with global organisations such as the UN, UNICEF, the World Bank, and others work together to create decent work for workers to thrive and work under healthy and safe conditions. Apart from the global response, most nations or governments promote and protect the health and safety of their workforce through national legislation, regulations, standards, and policies, as well as by adhering to ILO and WHO standards. Furthermore, nations or governments set up robust institutions and agencies to ensure strict enforcement of laws and policies

promoting and protecting the health and safety of labour across all industries. In addition to the global and national response, various organisations and businesses adhere to the national and global best practices and standards, and adopt contemporary OHS policies and interventions that are unique to their organisations or industries. Similarly, organisations may have committees and departments assigned to enforce and implement OHS practices, policies and regulations. Moreover, evidence has pointed to the fact that industries and businesses usually invest, prioritise and adhere to OHS standards and policies when the nation has comprehensive OHS guidelines, policies and legislation, and ensures strict adherence (Loeppke et al., 2015).

Africa's response to OHS issues has not been a desired one. A reason might be that African countries often disregard the importance of OHS in achieving socio-economic development and SDGs (Puplampu & Quartey, 2012; Quartey & Puplampu, 2012). Hence, improving OHS services in Africa remains a key intervention to saving thousands of lives and achieving SDGs 3.9, 8.8 and 16.6. Perhaps, addressing OHS gaps in Africa may lead to healthier lives and increased productivity to improve and promote decent work and maximise sustainable development outcomes.

In Ghana, the national constitution and other policies and regulations provide a little level of response to OHS issues. Ghana's 1992 constitution makes provision for every worker to have access to safe and healthy working conditions. Article 24(1) and Article 36(10) give the basis for every worker to have the right to work under safe, healthy and satisfactory work conditions and give the state the power to ensure that no worker is denied their right to a safe and healthy work environment and conditions. These provisions in the national constitution are

woefully ineffective because of poor enforcement or lack of it. As a result of globalisation, industrialisation, technological advancement, climate change, etc., the workplace is now more complex than previously. Ghana is also witnessing its portion of industrial growth and changes. Consequently, more workers in Ghana are now being exposed to different types of occupational hazards which account for heightened risk of occupational accidents, injuries, diseases and deaths (Asumeng et al., 2015). Despite this complexity at the modern workplace and the heightened risk of occupational accidents and related issues, Ghana does not have a comprehensive national policy on OHS as recommended and stated in the ILO convention number 155. Hence, it is challenging to create a decent and healthy workplace for every worker in Ghana as advocated by the ILO, WHO and UN (ILO, 2019a).

Aside from the provision made in the national constitution to promote and protect the health and safety of Ghanaian workers, few policies and regulations have also been put in place by the Ghana government. However, these policies and regulations do not tackle the complexity and modern-day OHS issues. For instance, the government introduced the Labour Act 2003, Act 651 that makes it obligatory for every employer to make sure employees are recruited or employed under safe and healthy conditions. The Act makes it obligatory for the employer to set standards for protecting workers from any harm and safeguarding the well-being of workers. Furthermore, this Labour Act makes it obligatory for the employer to provide essential training, information and supervision to enable employees to comply with the safety standards put in place. The same Labour Act makes it compulsory for employers to report incidents to the relevant government agency.

In addition, the Act makes it clear that employees need to act and exercise their actions with optimum care while working.

Notwithstanding, the Labour Act is flawed in many ways. In the first place, the act leaves health and safety standards in the hands of the employer and this has resulted in fragmented industrial health and safety policies and actions. Again, different agencies under different jurisdictions have been given the mandate to supervise and monitor OHS issues and standards. Furthermore, the Labour Act does not make it clear which national agency or office to report occupational accidents, injuries, diseases and deaths to. Besides, the Labour Act does not categorically state what is considered work-related injury, disease and death. Hence, it is difficult or challenging to record and report occupational injuries, disease and death in Ghana.

Apart from the Labour Act, there are the Factories, Offices and Shops Act 1970, (Act 328), Mining Regulation 1970 (LI 665), Ghana Health Service OHS Policy 2010, Workman's Compensation Law 1987 (PNDC 1987), Environmental Protection Agency 1994 (Act 490), National Road Safety Commission Act 1999 (Act 567), and Pesticide Control Management Act 1996 (Act 528). With the current industrial operations and contemporary Ghanaian workplace settings as well as the impact of climate change, industrialisation, globalisation, etc., these existing OHS legislation and policies are obsolete and may not comprehensively tackle the complexity and contemporary OHS issues in the Ghanaian workplace. Perhaps, industries in Ghana may be facing OHS issues because of the weak, fragmented and obsolete OHS standards and the weak enforcement of these standards (Annan et al., 2015).

There is a need for a better response to OHS issues in Ghana. First, Ghana has to adhere to the ILO convention requirement by adopting or developing a

comprehensive or broad OHS legislation or policy that will tackle the contemporary and complex nature of industries, best practices and global standards (Annan et al., 2015). Furthermore, different agencies mandated to monitor and supervise OHS issues in different industries such as the Environmental Protection Agency, Department of Factory Inspectorate, Mineral Commission, National Road Safety Commission (NRSC), Ghana Labour Commission, etc. need to be brought under one umbrella or agency. However, this agency will need legislative backings, resources and experts to manage OHS in the country (Amponsah-Tawiah & Dartey-Baah, 2011; Amponsah-Tawiah et al., 2016). The agencies under the national OHS should be clearly defined with clear roles and responsibilities, accountability, timelines for executing responsibilities and clear reporting guidelines. Most importantly, experts are needed to manage OHS at the national and organisational levels. Contrary to expectation, researchers have opined that there is a lack of OHS professionals in the country (Amponsah-Tawiah & Dartey-Baah, 2011; Amponsah-Tawiah et al., 2016). Therefore, universities and technical universities in Ghana need to be resourced and accredited to train OHS professionals for various industries and businesses. In addition, the informal sector should not be excluded. Hence, the government needs to support the informal sector workers, train and provide them with adequate information to create a safe and healthy work environment for such workers. Thus, the development and implementation of a national OHS policy should not reject the informal sector and focus on only the formal sector.

The government of Ghana needs to show commitment, value and leadership in adapting and implementing a comprehensive OHS policy through broader consultations with industry players including the informal sector. Moreover, there

is the need for synergy among industries, academia and government to make sure evidence produced by academia on OHS is understood and adopted effectively through knowledge brokering to inform the practice of OHS in the country. Finally, one key thing is enforcing OHS policies. The government needs to show optimum commitment towards strict enforcement of standards, guidelines and policies meant to create a safe and healthy work environment for workers in Ghana. For instance, evidence points to the fact that policies directed towards the promotion and protection of workers' health and safety do not only benefit workers but increase productivity for both the organisation and nation (Jilcha & Kitaw, 2017; Reese, 2017; Sorensen et al., 2018; Wong & Chan, 2018). Besides, OHS issues are no longer organisational level issues but of great public health interest that need key partnerships from the government, global organisations, employers and workers. The impact of occupational injuries, diseases and deaths goes far beyond the worker to families, communities, organisations and the larger society. Thus, the impact of OHS has both social and economic consequences (Amissah, Agyei-Baffour, Badu, Agyeman, & Badu, 2019; Hafeez, Abdullah, Riaz, & Shafique, 2020).

Overview of Ghana's Road Transport Sector

Ghana's transport sector is made up of road, rail, water or maritime, and civil aviation systems. Road transport remains the predominant means of commuting in Ghana. Thus, in Ghana, roads carry about 95 and 98 per cent of passengers and freight, respectively. Ghana's road infrastructure sector is supervised and managed by the Ghana Highway Authority (GHA), the Department of Feeder Roads and the Department of Urban Roads, agencies that are under the Ministry of Transport. Ghana's road transport can be put into four main segments: (1) urban, (2) rural-urban (3) rural and (4) inter-city. Road transport in Ghana is

dominated by private transport like the bus, mini-bus, car, long and short-haul trucks and taxis. Buses account for 60 per cent of passenger movements while taxis account for 14.5 per cent (Kufuor, 2012; Yobo, 2014) and private cars account for the rest. Road commercial transport or transit services are provided by the private sector, mostly the GPRTU. The government of Ghana also supports the sector through the operation of the inter-city STC and Metro Mass Transit (MMT). The inter-city STC has the mandate of moving passengers between cities, while MMT is mainly focused on rural-urban. There is Ghana Haulage Truck Drivers Association which started its operations in the year 1993. This association does not have its own vehicles but operates trucks owned by its members across the country through their local and regional branches.

Commercial driver's operation permits are granted by the Metropolitan, Municipal and District Assemblies (MMDAs). Thus, upon receipts of appropriate fees, the MMDAs issue operating permits to the transport unions rather than the individual commercial driver (Yobo, 2014). Hence, the MMDAs keep records of all commercial road transport vehicles operating within their jurisdictions. The coordination of commercial transport services by the MMDAs is for structuring and streamlining the operations of the commercial transport providers. The MMDAs take their powers from the Local Government Act 1993 (Act 462) to license commercial vehicles to operate in specific routes within their jurisdiction. In addition, the MMDAs control bus terminals and transport yards as well as loading stations across the country. The Driver Vehicle Licensing Authority (DVLA) is an agency required by law to license all vehicles and drivers whether commercial or private. However, the activities of the MMDAs and DVLA regarding licensing lacks coordination concerning their performance or functions (Yobo, 2014). The

lack of coordination between the MMDAs and the DVLA in licensing commercial drivers and vehicles is evident in several instances. One prominent example is the issuance of operating permits by MMDAs to transport unions rather than individual drivers, while the DVLA is responsible for licensing all drivers and vehicles. This division of authority can lead to discrepancies and inefficiencies in tracking and regulating the commercial transport sector. Additionally, the MMDAs' control of bus terminals and loading stations without synchronised oversight from the DVLA further highlights the lack of coordination between these entities, potentially resulting in challenges related to safety, compliance, and overall management of the transportation industry.

Road transport safety in Ghana is regulated by government agencies including the DVLA, NRSC and MTTD of the Ghana Police Service. Aside from MTTD, all the other agencies come under the Ministry of Transport (MOT). The DVLA draws its powers from the DVLA Act 1999 (Act 569) to ensure and promote a good standard of driving and the safety of motor vehicles and drivers. The DVLA has the sole responsibility of ensuring that the vehicles that ply the roads are road-worthy. In addition, the DVLA organises training programmes regularly for prospective and licensed drivers who want to acquire and upgrade their license respectively. The NRSC also draws its mandate from the NRSC Act 1999 (Act 567) to plan, formulate, promote and coordinate road safety interventions and policies. The NRSC provides information and educates all road users on the safe use of the roads in the country. They usually use advertisements, campaigns, seminars, mass media, etc. to educate and provide road safety information to the general public. The MTTD also draws its powers from the Road Traffic Act 2004 (Act 683). The MTTD's mandate is to enforce road traffic regulations in all aspects of road

transport in Ghana. In addition, the MTTD is mandated by law to control and manage road traffic situations in the country. Moreover, the MTTD is the only agency mandated to investigate and collect data on road traffic accidents in Ghana. All these three key agencies work in collaboration to promote safety on the roads in Ghana. They also work together with MMDAs to streamline public transportation systems in the country.

In Ghana, road networks and decent roads are far from desired, but road transport remains the major mode of transportation (Teye-Kwadjo, 2019). This is because other modes of transportation (air and rail) are underdeveloped, expensive, and in many cases unavailable (Blankson & Larney, 2020). This has put a lot of strain on public commercial vehicles to meet the everyday transportation needs of Ghanaians. Road transportation does not only facilitate the movement of people and products; it also provides a source of income for many people, and it is accessible to the average Ghanaian. However, the sector is beset by fatal and non-fatal traffic accidents. Data from the MTTD in 2020 shows that every day, about eight people die in road traffic accidents in the country (Boateng, 2021). Researchers have attributed the injuries and fatalities on Ghana's roads to poor road design, the inadequacy and/or lack of road signs, poor road maintenance culture, road user carelessness, precarious work environment and employment conditions of drivers, violations of safety values and poor vehicular maintenance culture (Boateng, 2020, 2021; Gyimah, 2020). Furthermore, non-standard methods of driver testing and licensing, fragmented commercial vehicle operations and lack of enforcement of road traffic regulations, institutional lapses in DVLA and GHA are well documented risk factors for road traffic injuries and casualties (Gyimah, 2020).

Psychosocial Work Factors in the Road Transport Sector

Psychosocial work factors are the aspect of job content or design and the social, organisational and management settings of a job that have the potential of causing psychological and physical harm to workers (Cox & Griffiths, 2005). Cox and Griffiths further argued that the physical and psychological harm is accompanied by impaired changes in physiological functions, behaviours, attitudes and feelings which may expose the worker to experience work-related stress which may impair performance. Perhaps, workers' coping ability is challenged when they are faced with job demands and pressures that are above their capacity, knowledge and ability (Useche et al., 2019).

Job demands and job resources are key psychosocial work factors (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Job demands are the social, physical and psychological components of the job that require the worker's sustained effort and have the potential of leading to impaired social, physical and psychological well-being. Job resources are the physical organisational factors that aid in meeting job demands and act as an agent for personal growth and learning (Demerouti et al., 2001). Job demands include workload, working hours, shift work, work pressure. Job resources include job control, skill discretion, support from colleagues and supervisors, career opportunity and advancement, participation in decision making, management priority for safety and well-being of workers, communication flow, role clarity, etc. (Alonso et al., 2020; Useche et al., 2019).

Demerouti et al. (2001) further argued that high job demands lead to wearing away (exhaustion) of workers' energy which becomes a risk factor for psychological distress that can lead to a heightened risk of depressive disorders and

health issues such as cardiovascular diseases. This is the health erosion hypothesis. Demerouti et al. further argued that adequate resources motivate workers, and this may lead to engagement and, in turn, result in improved organisational outcomes such as productivity. The second hypothesis is the motivational process. For example, adequate job resources strongly correlate with reduced psychological health issues (Bakker & Demerouti, 2017). Job resources may also act as a buffer or a protective factor on the effect of job demand on burnout or exhaustion (Bakker & Demerouti, 2017). Such work conditions may be present in many organisations including the transport sector, the common being road transport.

Professional drivers including long bus, mini bus, taxi and long-haul drivers are exposed to psychosocial hazards that affect their health, well-being and safety (Hege et al., 2018). Psychosocial hazards present in professional drivers' work environment include monotonous work, high level of uncertainty, lack of variety, high level of time pressure, long driving hours, continual subjection to deadlines, shift work, night work and inflexible work schedules (Peters et al., 2021). In addition, commercial drivers are exposed to conflicting demands of work, regular or frequent disruptions in sleep, high level of mental alertness and lack of rest or recovery periods (Useche et al., 2019). Moreover, researchers have reported that commercial transport drivers have low job control and autonomy on their job as well as limited possibilities of work pace control (Hege et al., 2018; Romero et al., 2018). Perhaps, a lack of job control and autonomy may prevent commercial drivers from partaking in decision making that helps to design favourable jobs for improved safety and health outcomes (Hege et al., 2018).

Professional drivers, especially long-distance commercial drivers, are exposed to work-life and work-home conflicts, monotonous and long hours of

loneliness, fatigue, job strain and long periods of exposure to constant vibration (Hege, Lemke, Apostolopoulos, Whitaker & Sönmez 2019). The long stay away from home may interfere with long-distance commercial drivers' family, personal and sexual life as well as access to healthy food and engagement in physical exercise. Perhaps, a long stay away from home exposes long-distance commercial drivers to infectious diseases such as HIV/AIDS and non-communicable diseases such as cardiovascular diseases and stroke (Hege et al., 2019; Peters et al., 2021; Useche et al., 2019). Moreover, Boateng (2021) has reported that the work of commercial drivers in Ghana is characterised by long working hours, harassment and abuse from road safety officers, lonely driving, terrible vehicle traffic jams in cities, and a low level of job control and autonomy over job design and pace. Boateng further revealed that commercial transport drivers in Ghana face issues of job insecurity, poor remuneration and persistent pressure to meet daily sales targets. Perhaps, these are the reasons for the high rate of road traffic crashes, injuries and fatalities on Ghana's roads (Boateng, 2021).

In summary, in the case of commercial drivers, evidence shows that there are inherent adverse and pressing psychosocial risk factors that exist in their work environment (Useche et al., 2017), including excessive work demands and considerable low or no job control in the road transport sector and this mismatch creates a stressful working condition for them (Useche et al., 2019). Hence, road transport drivers, especially commercial drivers, are faced with several risks and consequences for health and safety (Useche et al., 2017). Besides, Hege et al. (2019) have shown that the poor psychosocial work environment is associated with impaired physical and mental health as well as poor job performance and occupational health and safety outcomes. This may increase drivers' level of risky

driving behaviours and road traffic crashes which result in injuries and deaths (Gómez-Ortiz et al., 2018).

Road Transport Injuries, Diseases and Deaths Statistics

General and occupational road transport injuries, diseases and mortality from global and local cases are presented in this section. Response to road transport injuries, diseases and mortality is also presented.

Road Transport Injuries and Deaths

The road transport sector is critical to social and economic developments and aids in freight and passenger mobility in and across countries. However, the road transport sector causes significant societal, economic and financial loss through road traffic accidents and associated injuries and fatalities. For instance, the WHO (2018) Road Safety Report shows that globally, 1.35 million people die yearly through road traffic accidents and about 50 million people sustain various degrees of injuries. Thus, each day almost 3,700 people are killed globally in road traffic accidents. The WHO report further shows that most of these road traffic fatalities are suffered by road users such as pedestrians, cyclists and motorists. The ILO has estimated that over 22 per cent of all road crashes involve commercial or public transport vehicles (ILO, 2019b). In 2021, the WHO reported that road traffic accidents are the biggest cause of death for children and young adults aged 5 to 29 years around the world (WHO, 2021a). Furthermore, road traffic accidents are the eighth leading cause of death worldwide, and they are expected to rise to fifth by 2030 (WHO, 2018). The WHO 2018 road safety report again indicates that the majority of these crashes, injuries and deaths could be prevented or avoided if there are better legislation, policies and infrastructure.

Countries with low-income levels experience the worst part of road traffic accidents (WHO, 2021). This is justified in four ways. In the first place, about 60 percent of global registered vehicles are found in LMICs; however, they account for 93 percent of the world's road traffic deaths (WHO, 2021a, 2018). In addition, high-income countries have an average of 8.2 deaths per 100,000 people in road traffic accidents whereas it is 27.5 death per 100,000 people in LMICs (WHO, 2018). Also, in LMICs, the proportion of accident victims who die before reaching the hospital is more than twice that in high-income countries (WHO, 2018). These deaths might be as a result of disparities in health system infrastructure and poor post-accident response. Finally, the WHO world road safety report has revealed that LMICs have not reduced road traffic accident deaths since 2013 due to policies that focus on correcting risky driving behaviours, ignoring drivers' working conditions and poor nature of roads. These four reasons might explain why Africa is regarded as the continent with the highest burden of road traffic accidents and deaths (WHO, 2018).

Africa has the highest rate of road traffic accident fatalities of 26.6 deaths per 100,000 people and sub-Saharan Africa is regarded as the capital of world road traffic deaths (WHO, 2018). Vehicle occupants (40%) and pedestrians (39%) constitute the highest of road traffic fatalities in Africa (Deme, 2019). A recent review has shown that human factors such as speeding, reckless driving, fatigue, drunk driving, drug use, sleeping while driving, etc. account for over 80 percent of road traffic accidents in Africa (Deme, 2019). These factors place Ghana's roads among the deadliest roads in Africa.

The NRSC has reported that between the years 1991 and 2018, 46,284 people were killed in road traffic accidents in Ghana (Agenda for international

development, 2019). In addition, the NRSC reported that between the years 1991 and 2016, 128,208 people were seriously injured and 184,349 people sustained minor injuries (GhanaWeb, 2019). Also, data from the Motor Traffic and Transport Department of the Ghana Police Service show that between 2017 and September 2021, 41,449 commercial vehicles were involved in an accident resulting in 22,760 injuries and 2,614 deaths in Ghana. Ghana had a road accident death rate of 25.7 deaths per 100,000 population in 2019 (WHO, 2021c). These figures would be frightening if these estimates included information on road traffic accidents in rural or remote areas, which is typically not included due to shortcomings in vehicle accident reporting systems as seen in the majority of developing countries (WHO, 2018). Aside from WHO's (2018) report of flaws in road accident data from developing countries, previous evidence from a systematic review shows that accident data from sub-Saharan Africa do not reflect the true nature of figures due to underreporting estimated to be 50 per cent (Vissoci et al., 2017).

The mortality and morbidity figures associated with road traffic accidents are not just terrifying but also clearly shows that in Ghana a lot of people never return home from traveling (Blankson, Nonvignon, Aryeetey, & Aikins, 2020). Fatalities and injuries associated with a road traffic crashes in Ghana continue to pose considerable psychological distress and economic loss to victims, individuals, families, and the nation (Blankson & Lartey, 2020). Others who escape deaths end up being hospitalised for weeks, months and years while others sustain temporary and permanent disabilities (Blankson, Amoako, Ansah-Opoku, Odei-Ansong, & Lartey, 2019).

Road Transport Occupational Injuries, Diseases and Deaths

Professional drivers are at greater risk of occupational diseases compared to other occupational groups (Peters et al., 2021). Peters et al. further explained that compared to the general working population, professional drivers usually suffer from chronic occupational diseases at a higher rate. For instance, evidence produced by the US Bureau of labour statistics (2022) shows that bus drivers are among the top three occupations with the highest rates of occupational Musculoskeletal Disorders (MSDs). The report further shows that intercity and transit bus drivers recorded a higher rate of MSDs (206 MSDs per 10,000 population) among full-time commercial drivers.

Furthermore, evidence has shown that commercial drivers usually suffer from chronic occupational illness. For example, a systematic review of 56 studies conducted in 23 countries across the globe found a prevalence rate of MSDs between 43.1 and 93 per cent (Joseph et al., 2021). Joseph et al. further indicated that low back pain was frequently reported by driver groups (53%). It was also reported that about 63%, 33% and 18% of the commercial drivers suffered from hypertension, metabolic syndrome and type 2 diabetes respectively (Joseph et al., 2021).

In a different systematic review, Guest and colleagues (2020) conducted an extensive analysis of 95 studies involving truck drivers worldwide. Their findings indicated that truck drivers commonly exhibit unfavorable cardiometabolic characteristics, including conditions like obesity, overweight, hypertension, low cholesterol levels, diabetes, smoking, and depression. In a similar review, Crizzle et al. (2017) found that commercial drivers suffered hypertension, cardiovascular disorders, diabetes, fatigue, high cholesterol, obesity and sleep apnea. These

reviews show that working conditions and work environment play a critical role in determining the health outcomes of commercial drivers. In Ghana where road transport operations are largely informal, the lack of enforcement of safe working conditions may create precarious employment for drivers.

Studies conducted in Ghana also showed that commercial drivers are at high risk of occupational diseases. For example, a cross-sectional study among 57 metro mass bus drivers showed that approximately 39 per cent were hypertensive and about 19 per cent were also obese (Anto et al., 2020). Anto et al. further revealed that lack of rest and long working hours were risk factors for occupational diseases among professional drivers in Ghana. In another retrospective study of forensic autopsy records of professional drivers, the researchers found that 44% and 16% of drivers who died from traffic collision also had cardiovascular and respiratory diseases respectively (Ossei, Agyeman-Duah, Ayibor, Niako, & Safo, 2021). These studies point to the fact that professional drivers are exposed to precarious working conditions in their day-to-day work schedules which affect their health and safety (Besharati & Tavakoli Kashani, 2018; Johnson, 2020; Peters et al., 2021). Commercial drivers are exposed to physical and psychosocial hazards such as long working hours, high workload, strict work schedules, fumes, lack of rest, loneliness and low decision or job control (Dotse et al., 2019; Peters et al., 2021). Consequently, a review concluded that commercial drivers abuse alcohol and illicit drugs to compensate for depression, anxiety, job strain, fatigue, and loneliness (Garbarino, Guglielmi, Sannita, Magnavita, & Lanteri, 2018). These hazardous working conditions and existing coping strategies by drivers do not only complicate the health conditions of drivers but also question the integration of OHS in the activities of road transport operators.

In Ghana, OHS is not fully developed and integrated into the operations of various industries and, as a result, it is difficult to prevent work-related injuries, diseases, and deaths. For instance, less than 10 per cent of workers in developing countries such as Ghana have access to OHS services (Lucchini & London, 2014). Luchini and London (2014) further explained that aside from the poor quality of, and non-existence of OHS legislation, policies and programs, there is poor enforcement of OHS policies in LMIC. Perhaps, commercial drivers in Ghana work in a precarious environment and unhealthy conditions as a result of the fragmented and poorly enforced existing OHS policies in the country.

Response to Occupational Health and Safety Issues in the Road Transport Sector

The United Nations Inland Transport Committee (UNITC) has about 59 international transport conventions and serves as the centre for all United Nations (UN) inland transport conventions and provides legal instruments that provide a global regulatory policy or framework on inland transportation. In addition, the UNITC supports the implementation of SDG targets 3.6 and 11.2 that address road safety (ILO, 2020). The WHO supports the UN's response to road safety issues through the provision of secretariat services for the work of the UN. The WHO with support from the ILO presents guidelines and framework on the promotion of road safety in the road transport sector and decent work for the commercial drivers. These guidelines and frameworks give the basis for the setting and enforcement of policies and standards by governments and agencies for the safe operation of commercial passenger and freight transport services to reduce road traffic crash injuries and deaths (ILO, 2020).

The promotion of road safety and decent work in the road transport sector is a collaborative and a shared obligation of the transport owners, road transport chain parties, and governments. Road transport safety in Ghana is regulated by government agencies including the DVLA, NRSC and MTTD of the Ghana Police Service. However, the prevailing laws, agencies and enforcements machinery focus on drivers neglecting the precarious work environment in the transport industry in Ghana (Boateng, 2021; ILO, 2020). For instance, the NRSC has few standards, impacts and guidelines on OHS for the road transport industry and focuses on correcting risky driving behaviours. In addition, Ghana does not enforce or implement the UN inland transport and ILO conventions on the declaration of fundamental principles and rights at work (Amponsah-Tawiah & Dartey-Baah, 2011; Amponsah Tawiah & Mensah, 2016). These situations make Ghana's response to safety and decent work issues in the road transport sector produce insignificant results. To fully integrate OHS into the road transport industry in Ghana, government and industry players must adhere to the fundamental principles and rights at work instituted by the ILO (ILO, 2020). In addition, transport owners, companies, driver unions, civil society organisations and governments must adopt robust standards that are sensitive to contextual factors such as the informal nature of Ghana's commercial road transport sector to ensure the full integration of OHS standards in transport operations.

Ghana government, road transport agencies, social partners and driver unions in the road transport sector must ensure that the ILO declaration on the fundamental principles and rights at work and other policies and conventions such as the Equal Remuneration Convention 1951 and Forced Labour Convention 1930, number 29 by the ILO are carefully implemented and applied to all road transport

workers (Wood, 1991). Again, governments must take measures to eliminate all sorts of discrimination with regard to remuneration and eliminate child labour in the road transport sector. In addition, the Ghana government must formulate, implement and strictly enforce policies that prevent and eliminate the use of compulsory labour and precarious employment contracts in the commercial roads transport sector.

Furthermore, employers, agencies and road transport industry players must ensure that commercial or public transport drivers are not forced to work under inhumane conditions or in violation of working time (driving time) without adequate resources and remuneration as stipulated by laws in Ghana and international standards. In addition, employers in the road transport sector must take appropriate actions regarding their OHS obligations in line with ILO's Occupational Safety and Health Recommendations 1981, number 164 (Wood, 1991). Thus, OHS recommendation by the ILO when fully integrated into the road transport sector may help manage psychosocial work factors and eliminate all forms of precarious working conditions that commercial drivers are exposed to. Long-distance drivers should also be targeted with interventions for improved health outcomes while they stay away from their families and homes.

Long-distance drivers are difficult to reach because they may be away from home for an extended period. Hence, governments, employers, civil society organisations and occupational hygienists should organise sensitisation and training programs that should be aimed at preventing sexual risky behaviours that may harm both drivers, their victims, and regular sexual partners. Perhaps, such training and sensitisation efforts should also be aimed at ensuring healthy and responsible sexual behaviours of commercial drivers, especially ensuring that long-distance drivers do

not involve minors or engage in sexual exploitations. In addition, the training programs and opportunities must be linked with commercial drivers' career and skills improvements which are essential job resources. The use of technology to monitor long-distance drivers' adherence to rest breaks and also to pick vital medical signs may help ensure that their well-being is prioritised by employers and supervisors. Perhaps, the use of bus rest stop clinics may help to provide basic medical care services to long-distance drivers who have difficulties in accessing health care (Crizzle et al., 2017). These strategies may help provide relevant data to employers and supervisors for decision making.

Ghana government should identify and implement strategies that may help collect relevant data on commercial drivers in Ghana to inform policies and standards in the road transport industry. For instance, data on employment, working time, earnings and other conditions of work may help compare working time and earnings with the rest of the workforce or other occupational groups. Besides, data on the working time of commercial drivers may help identify and distinguish breaks, shift patterns, asocial hours, recovery periods and incidence of overtime. Regular surveillance of commercial road transport drivers may also reveal safety issues, crashes, occupational illness and diseases they face.

Finally, the government must examine state agencies ensuring road safety in Ghana such as the MTTD, NRSC and DVLA to identify and address any inconsistencies and sub-standard performances and implementation of policies in the road transport sector. Also, government, driver unions, and transport owners and companies must ensure the provision of safe commercial drivers' welfare, rest and parking infrastructure or facilities. Furthermore, the commercial road transport work environment should be free of violence, harassment and precarious

employment conditions. This decent work environment can be achieved through robust inspection and enforcement systems as well as opportunities for redress and complaints legislation policies that are accessible, equitable and impartial for all commercial road transport drivers in Ghana. Hence, health promotion interventions integrating workplace health promotion, improving working conditions and enforcing occupational health and safety standards in road transport activities are needed to create a safe and healthy workplace for all professional drivers in Ghana.

Theories of Psychosocial Work Factors

Theories and models are well-substantiated and tested assumptions. Theories and models coexist to guide research (Strifler, Barnsley, Hillmer, & Straus, 2020). Theories and models that explain psychosocial work factors are usually work stress theories and models that have their roots in work, organisations, and psychology (Dollard, Dormann, & Idris, 2019). Job Demand-Resource (JD-R) model and PSC theory are work stress models that explain precursors of precarious working conditions and impaired work outcomes.

Job Demand-Resource (JD-R) model

The JD-R model lays emphasis on job design. The JD-R considers a broader range of demands and resources in predicting and explaining workers' well-being, engagement and performance (Demerouti, et al., 2001). Job demands are the social, physical and psychological components of the job that requires the worker's sustained effort and has the potential of leading to social, physical and psychological well-being. Job resources are the physical organisational factors of a job that aid in meeting the physical, social and psychological job demands and also act as an agent for personal growth and learning (Demerouti et al., 2001).

Demerouti et al. argued that high job demands lead to wearing away (exhaustion) of workers' energy which becomes a risk factor for safety issues and psychological distress. The long run of exhaustion leads to a heightened risk of depressive disorders, accumulated fatigue and health issues such as cardiovascular diseases, musculoskeletal disorders, and impaired work performance. This is the health erosion hypothesis. Demerouti et al. further argued that adequate resources motivate workers, which may lead to job engagement and in turn result in improved organisational outcomes such as increased productivity and improved work performance (Bakker & Demerouti, 2017). The second hypothesis is the motivational process.

There are several linkages between the two main hypotheses in the JD-R model that can be applied to the work environment of commercial drivers. For example, adequate job resources available to professional drivers may strongly correlate with improved psychological well-being and improved driving performance (Useche et al., 2019). In addition, job resources may also act as a buffer or a protective factor on the effect of job demand on perceived psychological well-being among professional drivers (Useche et al., 2019). The researchers further lamented that job strain is a risk factor for impaired driving performance whereas motivation has a strong linkage with improved driving performance. These links in the JD-R model are essential because they present a complex situation or condition that shows how professional drivers' poor health impact negatively on their performance and other organisational outcomes.

Recently, job crafting has been the new addition to the JD-R model (Bakker & Demerouti, 2017). Job crafting is an individual or a worker's work design procedures which are mainly proactive strategies to alter job characteristics to align

with the worker's skills, capacity, goals and needs without compromising performance and productivity. This innovative job design aspect of the JD-R model which duels on the proactiveness of workers contradicts the classical job design theory (Hackman & Oldham, 1976) which emphasises the top-bottom approach to work design. With job crafting, professional drivers actively and proactively adjust tasks and resources in their job or work environment to suit their needs, goals and skills. I need to emphasise that proactiveness on the part of the professional drivers, for example, may be dependent on the control or decision-making authority and the freedom she or he has at work (Useche et al., 2017).

According to Dollard et al. (2019), the JD-R model lacks direction and concreteness regarding some constructs such as job control and social support (Notelaers, Törnroos, & Salin, 2019). Constructs such as job control and social support are treated as latent constructs while they are specific. A meta-analytic review by Luchman and González-Morales (2013) recommended that job resources at work like job control and social support must be treated as specific or independent as opposed to latent constructs predicting professional drivers' well-being. Also, the JD-R model was derived from a meta-analysis (Yaris, Ditchburn, Curtis, & Brook, 2020). Yaris and colleagues further argued that there is a lack of evidence to fully understand the association between autonomy and burnout as well as safety outcomes.

The JD-R model has been useful since its inception. The JD-R model helps to explain why professional drivers may be stressed at work. The model is also useful in providing solutions for professional drivers to negotiate with management to create a safe working environment through job crafting. In a meta-analytic review, Lesener, Gusy, and Wolter (2019) recommended that the JD-R model is an

outstanding theoretical model which gives the basis to examine workers' well-being across a wide range of occupations. For instance, in a study among 760 Norwegian teachers, Skaalvik and Skaalvik (2018) reported that high job demand was strongly found to be associated with impaired teachers' well-being whereas job resources were moderately related to improved teachers' well-being. Moreover, in examining the validity of the JD-R model among 843 German police officers, Wolter et al. (2019) reported that job demands such as workload, organisational stressors and assault by the public are statistically significant and positively related to emotional exhaustion among the police officers. Furthermore, public transport operators can also rely on this model to manage, motivate and support commercial drivers by creating a safe working environment where drivers are given the needed control and resources necessary to promote a healthy work environment and improved performance (Useche et al., 2019). Also, Cendales-Ayala, Useche, Gómez-Ortiz, and Bocarejo (2017) found that job resources moderate the negative impact of job demand on both physiological and psychological well-being.

Psychosocial Safety Climate (PSC) theory

The PSC theory proposed by Dollard and Bakker (2010) has over the past decade been providing some useful multilevel explanations to the cause of occupational stress and psychological distress among workers. PSC refers to the policies, interventions, practices and procedures used for the protection and promotion of the psychological health and safety of workers (Dollard & Bakker, 2010). Recently, occupational health research has started emphasising upstream work factors that may affect the mental health of workers (Bakker & Demerouti, 2017). Upstream work factors are basic organisational conditions that are outside

the workers and are inherent in working conditions like job demands and resources (Bakker & Demerouti, 2017).

The PSC theory considers the combination and integration of both work stress and safety climate concepts (Dollard & Bakker, 2010). PSC is concerned with the shared perception of workers about the degree at which management's policies, programs and procedures value and prioritise the promotion and protection of their psychological well-being (Dollard et al., 2019). Dollard et al. further explain that the PSC theory can be integrated with other stress models like the JD-R, and Effort Reward Imbalance because PSC can be a predictor of both health erosion and job motivation hypotheses and as well act as a buffer on the effect of job demand on workers' health, safety and performance outcomes (Hall, Dollard, Winefield, Dormann & Bakker, 2013).

Dollard et al. (2019) have argued that there are four main realms of PSC theory: (1) management degree of priority given to the psychological well-being of workers; (2) management commitment and immediate action towards the protection and promotion of workers psychological health and well-being; (3) management ensuring effective communication between management and workers (both up-wards and down-wards communication) with regard to the promotion and protection of workers' psychological health; and (4) management ensuring optimum participation and involvement of all workers in promoting and protecting the psychological health of workers at the workplace. These four realms when fully integrated into the work environment may help promote and protect the psychological well-being of workers.

The buffering effect of PSC reflects that PSC acts as a safety signal prompting professional drivers about the impact and gains and if it is safe or

harmful to use resources to adjust to the demands of the job (Law, Dollard, Tuckey, & Dormann, 2011). Thus, PSC in an organisation creates a healthy work climate and working conditions that enable professional to adjust and cope effectively with job demands including long driving hours, lone driving, time pressures, irregular shift work, etc. (Yulita, Idris, & Dollard, 2014). Managements' disregards for the psychological well-being of their drivers have a direct negative impact on the drivers' health and driving performance (Wilton et al., 2019). Also, professional drivers in an organisation or work environment with higher PSC may experience improved psychological health (Yulita et al., 2016).

Evidence from empirical studies has provided persuasive support for PSC as an essential component of OHS practice. PSC has been shown as a strong predictor of reduced job demands, improved job resources, reduced effort-reward imbalance and less workplace abuse (Dollard et al., 2019). Furthermore, Bronkhorst and Vermeeren (2016) found that PSC was associated with emotional exhaustion, musculoskeletal disorders, absenteeism and presenteeism among healthcare providers in the Netherlands. These findings demonstrate the importance of giving enough commitment and attention to PSC to protect the well-being of workers and improve the performance outcomes of an organisation.

PSC is also an essential organisational concept that can serve as an important organisational resource in reducing occupational stress (Dollard & McTernan, 2011; Dollard, Tuckey, & Dormann, 2012; Wilton et al., 2019; Yulita et al., 2016). This means that in occupations with high job demands like professional driving, PSC may reduce the negative impact of emotional or psychological demand through enhanced uptake of job resources by drivers. However, in a low PSC work environment, the uptake of resources by drivers to

deal with job demands may be fruitless. Thus, job resources may be abundant at the workplace or work environment of the commercial driver; however, the resources may not be utilised by drivers for their purpose unless there is encouragement and assurance from management for resource utilisation. For instance, in a bus transport company, a professional driver may not seek psychological help if his or her colleagues see her/him as weak but with high PSC, help-seeking is encouraged and normalised.

In summary, the JD-R model is a basic job or work design model that focuses on social determinants of working conditions and dwells on job designs. PSC affects how jobs are designed. Job demands and resources (job design) influence drivers' psychological health and engagement and work outcomes such as injuries, accidents, etc. PSC also serves as a buffer on the effect of job demands and resources on the health of the worker. The PSC model is presented in figure 1.

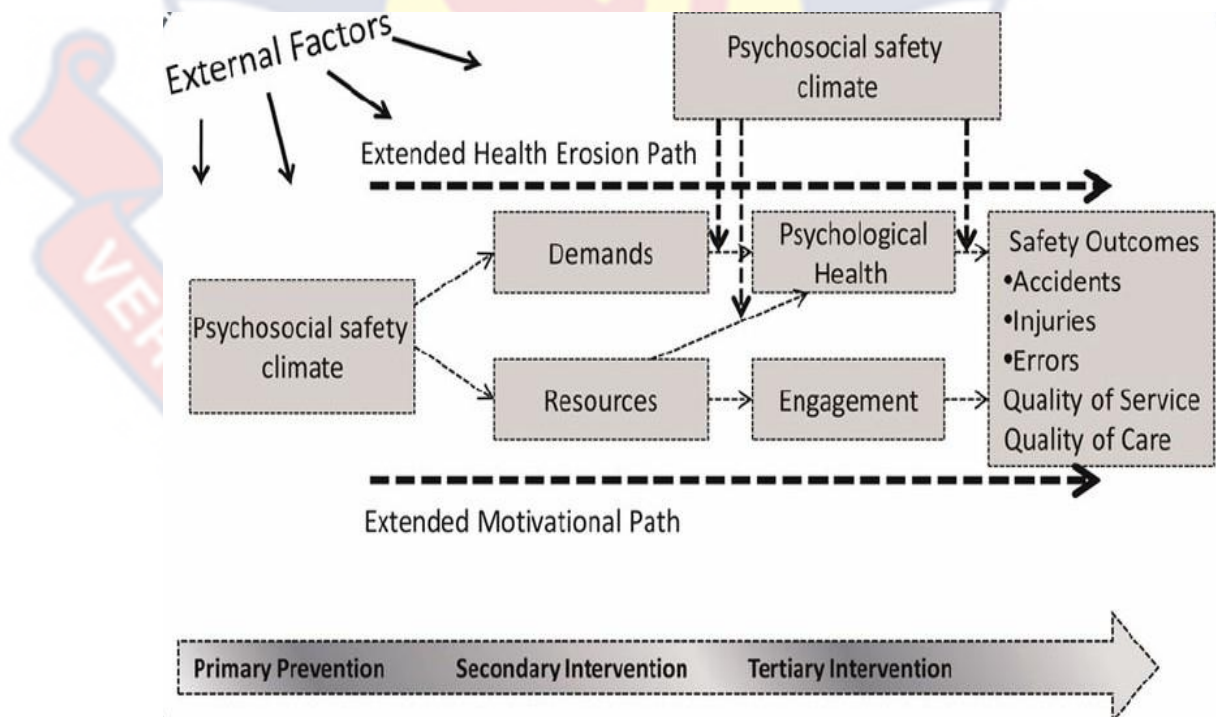


Figure 1: PSC model of work stress (Dollard & McTernan, 2011)

Relationship among Job Demands, Well-being and Job Performance

Job demands affect health and safety or performance outcomes using the health erosion hypothesis argued by the originators of JD-R and PSC models of job design and work stress. The effect of job demands on health and work outcomes has been tested across different occupations and countries. For instance, Ibrahim et al. (2021) examined the relationship between psychosocial work environment (job demands, job control and social support) and psychological well-being among 335 high school teachers in Malaysia. Data from this cross-sectional survey were analysed using the hierarchical linear regression model. The researchers reported that job demands, job control and social support statistically predicted the psychological well-being of teachers. Furthermore, the researchers reported that the effect of job demands on psychological well-being (depression and anxiety) was partially moderated by job control and social support.

In addition, Skaalvik and Skaalvik (2018) examined how teachers' perception of job demands in school settings was related to their well-being, engagement and motivation to quit the teaching profession in Norway. Data from 760 teachers were analysed through structural equation modeling. Skaalvik and Skaalvik (2018) reported that job demand was a strong predictor of teachers' well-being. Moreover, teachers' well-being mediated the relationship between job demands and job engagement. These findings imply that job demands may not necessarily deprive the job engagement of teachers but the job engagement of teachers may be deprived when teachers are unable to cope with the demands of their work. Though there were variations regarding how researchers measured job demands in both studies (Ibrahim et al., 2021; Skaalvik & Skaalvik, 2018), their findings confirm both the health erosion and motivation process hypotheses.

Teachers with high job demands are at a higher risk of experiencing adverse health issues including mental distress (Hindman & Bustamante, 2019). The social support that exists in the school environment is key in buffering the effect of job demand on teachers' psychological well-being (Ibrahim et al., 2021). A study conducted with 316 teachers in Poland has shown that job demands have a stronger effect on psychological health than physical health (Baka & Baka, 2015). Hence, school management and administrators should prioritise the psychological well-being of teachers by providing enough resources to avert the psychological harm teachers are exposed to (Dicke, Stebner, Linninger, Kunter, & Leutner, 2018).

Teachers at tertiary institutions are not exempted from the psychological distress of high job demands. Mudrak et al. (2018) examined the effect of job demands on the well-being of 1,389 full-time lecturers in Czech Republic public universities. Using a structural equation model, the researchers reported that job demand (work-family conflict) was strongly associated with mental distress. Hence, teachers, regardless of their level of teaching, are experiencing psychological distress due to their high job demands. Adequate job resources and policies directed towards the quality of leadership, flexible work demands and work-family balance at educational institutions may be essential in reducing the effect of job demands on teachers (Adriano & Callaghan, 2020)

Using participants from the hospitality industry, Ariza-Montes, Arjona-Fuentes, Han, and Law (2018) also confirmed the health strain hypothesis. Data collected from 2000 hospitality workers in 35 European countries showed that psychological job demands have a direct and significant effect on psychological well-being. Once again, social support was demonstrated as an essential job resource in a psychologically demanding occupation. The finding means that job

demands are necessarily not harmful or stressful if workers in a work environment have control over their job schedules and have adequate social support from their colleagues. This also means that promoting a culture of social support can be a strategy to reduce psychological job strain among workers. In the same hospital industry, Darvishmotevali and Ali (2020) studied the effects job insecurity has on workers' subjective well-being and, consequently, job performance among 250 hospitality workers in Tehran, Iran. The researchers found that job insecurity results in poor performance through impaired subjective well-being. Also, subjective well-being had a positive and statistically significant effect on job performance and partially mediated the negative effect of job insecurity on job performance.

Using workers from the oil and gas industry as participants, Obrenovic, Jianguo, Khudaykulov, and Khan (2020) explored the effect of job demands (work-family conflict) on psychological safety and well-being. A sample of 277 workers in Bahrain was used for this study. The researchers reported that work-family conflict had a negative effect on psychological safety and well-being. Also, the researchers reported that psychological well-being and safety have a strong positive effect on job performance. Thus, when the psychological well-being of the oil and gas workers got impaired, their job performance also reduced accordingly. The findings of the study shows that high job demand as a result of work-family imbalance can affect workers' well-being and productivity. Employers, management and leadership should not focus only on inspiring and fostering a healthy work environment but should also consider policies and interventions that ease or lessen work-family conflict that can be detrimental to poor organisational behaviours and outcomes. Understanding the causes of work-family imbalance allows industries to design healthy and favorable working conditions that will

improve workers' mental well-being. Perhaps, improving work-family imbalance through job design is an innovative way of enhancing job performance (Mansour & Tremblay, 2018; Nigatu & Wang, 2018; Obrenovic et al., 2020).

Juvani et al. (2018) examined the relationship between work stress (job demand) and risk of disability among 41,862 general working population. The researchers found that 49.2 per cent of the participants had, at least, experienced work stressors such as job strain, effort-reward imbalance and workplace injustice. Also, workers with high job strain, ERI and workplace injustice were at higher risk of disability retirement from depressive disorders and MSDs. The result showed that job strain, ERI and workplace injustice have a major impact on MSDs whereas ERI and workplace injustice had a major impact on depression. This study demonstrated that it is essential to consider the combination of job stressors to gain a deeper understanding of how they impact workers' health and job performance.

In a longitudinal study on male health in Australia, LaMontagne et al. (2016) collected data from 15,988 males in the general working population to examine the effect of psychological job quality (low job control, high demands, task complexity, high job insecurity, low fairness of pay, long working hours and shift work) on mental health and subjective well-being. Using multiple regression, the researchers reported that 49.9 per cent of those in active work worked more than 40 hours per week and 23 per cent were in shift work. The researchers also found that 63 per cent of those in active work reported being exposed to at least one of the high job demands. The researchers further reported that there was a strong positive association between poor psychological job quality and mental illness and subjective wellbeing. However, after controlling for potential confounders, poor job quality showed a strong positive and significant association with subjective

well-being. This finding shows why there is a growing policy and interest in employees' well-being (Hall, Johnson, Watt, Tsipa, & O'Connor, 2016). It also shows that including well-being measures in workplace policy and routine risk assessment of psychosocial risk factors should be an essential part of workplace assessment.

Health and safety professionals advocating for health safety work are also vulnerable to psychosocial hazards at work. Leitão, Mc Carthy, and Greiner (2018) studied the psychosocial working conditions of Health and Safety Professionals (HSP) to understand the effect on their health and well-being. Data collected from 879 HSP in the United Kingdom (UK) and Ireland were analysed using multiple linear regression. The result shows that high job demands were statistically significant and negatively correlated with HSP general health and well-being after adjusting for age, gender and years of experience. This finding may be a result of increased job responsibilities of OHS professionals in the UK and Ireland. The researchers also found a low safety climate among participants. In a workplace with a low safety climate, OHS might not be the priority of management. Also, in such an environment, HSP may not have the power to take the actions necessary to improve or promote the health and safety of workers. Thus, HSP professionals may not have control over their job. Perhaps, HSP may get less support from their managers or supervisors which may have an impact on their health and performance.

The findings of Leitão et al. (2018) are similar to the findings of Gómez et al. (2019). Gómez et al. (2019) examined the relationship between psychosocial working conditions and mental health among 1,594 healthcare professionals in the United States of America. Gómez et al. (2019) found that job demand is

significantly and positively related to psychological distress. This means that healthcare workers, just like OHS professionals, are not immune to the negative effects of psychosocial hazards.

Furthermore, young people at the workplace are not exempted from the negative impact of work stressors. Milner, Krnjacki, and LaMontagne (2017) examined the differences in young people's mental well-being when they were not in the labour force and when they had jobs. Data were collected from 10,534 Australian young people at age 30 or below. The result showed that young people who have jobs with poor psychosocial conditions had poorer mental health and experienced improved mental health when they were in a job with good or quality psychosocial working conditions. The researchers adjusted for life events and other job stressors apart from the psychosocial work environment. This finding proved that young people need an optimum psychosocial working environment for improved mental health and subsequently on their job performance. The result also means that an optimum psychosocial work environment offered to young people also promotes their well-being and prevents future mental health issues (Milner et al., 2017). This study failed to consider critical psychosocial work factors such as work-family conflicts, their roles in their household, social support at work, job autonomy, etc. which might have contributed significantly to the results of the study.

Job demand has also been linked to road safety issues. For instance, Li, Wang, Li, and Zhou (2017) explored the effect of job demands (hindrance and challenging demands) on driving anger among 411 office-based workers in China. The researchers found that challenging and hindrance job demands had a statistically significant positive association with emotional exhaustion which in

turn was positively related to driving anger. The study also found that work engagement was positively associated with driving anger which indicates that highly engaged drivers or employees may exhibit more driving anger. These findings within the JD-R framework were relevant because the association between occupational stress and violent and abusive driving behaviours among drivers has been ignored as a major factor in road safety (Boateng, 2021). Furthermore, the findings also provided evidence for the extension of the JD-R model to road safety. Hence, companies need to adopt effective occupational stress management interventions to help employees cope with hindrance demands and work stress.

Llamazares, Useche, Montoro, and Alonso (2021) explored 588,997 community crashes among professional drivers in Spain to describe the characteristics of these crashes. This 12-year data used for the study was collected by the police. The data were analysed using frequencies and percentages, Pearson correlation and heatmap analysis. The researchers found that the age and years of service of professional drivers were statistically significant and positively related to the duration of sick leave and negatively associated with road traffic crashes. The researchers further reported that drivers from smaller companies were at a higher risk of severe crashes and more sick leave days. In addition, drivers with limited experience fewer than 10 years suffered severe crashes. Again, commuting crashes were significantly higher during peak hours of the day. The heatmaps showed that most commuting crashes occurred in the daytime. Perhaps, time pressure and fatigue may be risk factors. Thus, lack of recovery and rest from day work has been shown as strong predictors of impaired driving behaviours or performance among professional drivers (Chen & Zhang, 2016; Useche et al., 2017). Hence, adequate quality sleep of an average time of 8 hours had been recommended for safe driving

for professional drivers (Llamazares et al., 2021). Flexible schedules and adequate recovery periods are essential aspects of a healthy work environment for professional drivers. Replacements of drivers may be useful during peak times.

Driving of motor vehicle is a complex monotonous and demanding task especially for professional drivers (Alonso et al., 2017). Professional drivers usually find themselves in adverse and threatening working conditions that have a direct and indirect impact on their health and driving performance as well as the welfare of passengers and other road users. Working conditions such as long hours of driving, irregular shifts, constant vibration, overstimulation and stressors may expose professional drivers to mental distress, fatigue and impaired driving performance (Peters et al., 2021). A study by Useche, Ortiz and Cendales (2017) examined the relationship between job stressors, fatigue, health and road traffic crashes among 524 Colombian rapid transit bus drivers. The researchers reported a strong and positive association between job demands and risky driving behaviours. Bus drivers exposed to high-level fatigue also reported issues of diabetes and high cholesterol. Bus drivers who scored high in fatigue were more likely to engage in risky driving. This finding means that the health and performance of bus drivers are affected in the short and long term by their exposure to psychosocial hazardous conditions. Also, job strain and poor remuneration may cause fatigue among professional drivers, and drivers with high fatigue perceive their driving as dangerous (Karamali et al., 2020). Fatigue is a relevant component to be considered in job design aimed at improving the working conditions of professional drivers and also improving driving performance indicators.

A study by Useche, Gómez, Cendales, and Alonso (2018) has shown that psychosocial working condition has acquired an essential role in understanding and

explaining the well-being and driving performance of different driver groups of commercial transport. The researchers examined the relationship between job strain and the performance of commercial drivers. The researchers collected data from 780 commercial drivers from three different transport companies in Colombia. The data were analysed using hierarchical regression analyses. The researchers reported that job insecurity, psychological demands and job strain were significantly and positively associated with the number of road traffic accidents. Commercial drivers who reported high road traffic accident rates also perceived high job insecurity, job stress and work demand. This finding shows that the perception of job insecurity is relevant in explaining occupational accidents. Perhaps a previous study by Cendales et al. (2017) has shown that a high perception of job insecurity was a risk factor for road traffic crashes among city bus drivers.

Among professional commercial drivers, studies reviewed have shown that high job physical and psychological demands with limited decision making and skill discretion may explain higher records of job strain and road traffic accidents. Moreover, evidence indicates that professional drivers that experienced fatigue at work due to high job demands also experienced different health issues, impaired driving performance, errors, and violations behind the wheels (Cendales et al., 2017). However, a high level of job resource, social support and improved well-being appear to protect professional drivers against driving errors, violations, etc. (Bowen, Budden, & Smith, 2020; Chen & Hsu, 2020).

Relationship among Job Resources, Well-being and Job Performance

Job resources are critical aspects of the work environment that are essential to the attainment of work performance, team and organisational goals (Nielsen et al., 2017). Furthermore, job resources help in reducing the impact of job demands

on the well-being, health and safety of workers (Bakker & Demerouti, 2017). Job resources usually work on the motivational pathways. Thus, job resources contain an inherent motivational quality that works by satisfying the needs of workers (Schaufeli, 2017). The motivational qualities in turn lead to work engagement (Tuan et al., 2020). Thus, job resources affect organisational and employees' work outcomes via work engagement (Schaufeli, 2017).

In the study by Skaalvik and Skaalvik (2018), job resource was a moderate predictor of teachers' well-being. Furthermore, job resources, directly and indirectly, predicted higher job engagement. The indirect association between job resources and job engagement was mediated by higher well-being. Receiving social support from colleagues may strengthen teachers' adaptability and help create a sense of belongingness which may improve well-being and job engagement (Skaalvik & Skaalvik, 2018). Moreover, organisational support has positive and significantly associated with workers' safety behaviours and well-being (Kanten, Durmaz, Kaya, Akkoyun, & Kanten, 2019). This shows that while job demands may be a risk factor for burnout, psychological distress, strain, impaired health and poor safety performance, job resources may be essential tools that provide engagement and commitment which may, in turn, lead to improved job performance and safety outcomes.

Brauchli, Jenny, Fülleman, and Bauer (2015) decided to test the JD-R health model to identify the paths that link job demand and resources to positive and negative work outcomes. Data were collected from 2,159 general working population in Switzerland and analysed using a structural equation model. Brauchli et al. (2015) found that job resources (supportive leadership, interpersonal justice, manager support, manager appreciation, peer support, peer appreciation, job

control and task identity) had a strong positive association with positive health. The researchers further reported that there was a negative and significant relationship between job resources and job demands. This negative relationship between job resources and job demands meant that in a resourceful environment, work demands has less impact on workers' health. Similarly, a current study among 1,599 general working population in the small-scale businesses found that job resource was positively associated with the workers' health and well-being (Lopez-Martin & Topa, 2019).

Rasool, Wang, Tang, Saeed, and Iqbal (2021) examined the effect of a hazardous work environment on employee engagement among 301 employees in the SME sector in China. Using the structural equation model, the researchers found that a toxic work environment harmed employee engagement. The researchers further reported that organisational support and employee well-being significantly mediated the relationship between toxic work environments and job engagement. Similar studies have shown that organisational support played a mediating role in the relationship between job demands and work engagement (Ariza-Monte, Leal-Rodríguez, Ramírez-Sobrino, & Molina-Sánchez, 2019; Tziner, Rabenu, Radomski, & Belkin, 2015). Organisational support is the level at which employees perceive that the organisation they work for values their contribution and well-being (Chen et al., 2020). Thus, in a toxic work environment, high organisational support may reduce the impact on employees' well-being, engagement and other employee outcomes. It means that when management provides health and financial support, workers are likely to give their full attention to their job and responsibilities. Rasool et al. (2021) showed that employees' well-being can reduce

the effect of workplace psychosocial hazards on employee outcomes like work engagement and performance.

The mediating role of employees' wellbeing had been reported by Zhou, Rasool, and Ma (2020) who found that employees' well-being mediated the relationship between work hazards and innovative work behaviour among small scale business workers. It is well established that both organisational support and well-being can reduce toxic workplace psychosocial hazards and improve organisational performance (Chung, Cooke, Fry, & Hung, 2015; Heffernan & Dundon, 2016; Su & Swanson, 2019). Other essential job resources such as autonomy and social support have been found to improve safety performance and physical health among health care workers (Bronkhorst, 2015). Hence, committing job resources has the potential of improving job performance and health outcome through improved well-being. The benefits of job resources can also be felt in other high demanding work environment such as the banking and transport sectors.

In South Africa, Gauche, Beer and Brink (2017) conducted a qualitative study to gain an understanding of the impact of work resources on employees' well-being. Through a phenomenological design, 20 financial service workers were purposively and conveniently sampled. Through thematic analysis, the researchers found that both job resources (career opportunities, coaching, leave, role clarity, colleague support, supervisor support and communication) and personal resources (affective, cognitive and behavioural coping) had an impact on the well-being of employees. The researchers reported that creating awareness by management about job resources increased the use of such resources by employees. This study proved that creating awareness about the availability of job resources to at-risk workers and encouraging these workers to make use of job resources lead to improving well-

being and job engagement. Creating an organisational culture where workers' well-being is a priority and workers are encouraged and trained to make use of job and personal resources are innovative ways of promoting and protecting workers' health and safety.

In the transportation sector, job resources have been explored on how it impacts workers' well-being and job performance. For instance, Di-Marco, Arenas, Giorgi, Arcangeli and Mucci (2018) investigated the effect of a discriminatory work environment on truckers' psychological well-being when job resources act as moderators. Data collected from 114 truckers in Italy were analysed using structural equation modeling. The researchers found that job autonomy was positively and significantly related to psychological well-being. The researchers further reported that job autonomy partially mediated the relationship between discriminatory work settings and truckers' psychological well-being. These findings revealed that truck drivers who had the liberty to partake in some decisions regarding how, when and where work was done experienced improved psychological well-being. Perhaps, drivers with high job autonomy were more resilient in dealing with workplace stressors which might enhance their psychological well-being (Gardner, 2020). In addition, the researchers found that co-worker support moderated the relationship between discriminatory work environment and psychological well-being. This finding meant that co-workers helped more to deal or cope with discriminatory work environments than did supervisor support. Perhaps, truckers did not see supervisor support as a useful job resource when they perceived a discriminatory environment. However, a previous study by O'Brien, McAbee, Hebl, and Rodgers (2016) found supervisor support as a moderator on the relationship between discriminatory environment and well-being among academics. The difference in

the findings may be the sample used for both studies. Di-Marco sampled long-distance truck drivers who might have less contact with supervisors, unlike academics who may have more contact with their supervisors.

Finally, Guo, Liu, Chu, Ye and Zhang (2019) studied the predictive and moderating role of organisational support (supervisor and co-worker) on safety performance among 470 drivers in China. Data collected by this survey was analysed using hierarchical regression. Guo et al. (2019) found that safety support from supervisors and co-workers were significant and positively associated with safety compliance and participation. Thus, among the railway drivers, safety support from supervisors and co-workers were essential and desirable psychosocial job resources. Guo et al. (2019) further reported that both supervisor and co-worker safety support moderated the relationship between job insecurity and safety participation. Perhaps, the drivers benefited from safety support from supervisors and co-workers to participate in safety interventions when they perceived job insecurity.

In summary, most of the studies reviewed on the relationship among psychosocial work factors (Job demand and resources), well-being and performance were mostly cross-sectional studies with only two studies being a longitudinal study (LaMontagne et al., 2016) and qualitative study (Gauche et al., 2017). In addition, most studies used non-representative samples which affected the generalisation of their study findings (e.g., Baka & Baka, 2015; Darvishmotevali & Ali, 2020; Gómez-Ortiz et al., 2018; Ibrahim et al., 2021; Li et al., 2017; Mudrak et al., 2018; Obrenovic et al., 2020; Skaalvik & Skaalvik, 2018). Again, few studies adjusted for potential confounding variables to find true associations that exist between and among variables of interest (e.g., LaMontagne

et al., 2016; Leitão et al., 2018; Milner, Krnjacki, & LaMontagne, 2017; Guo et al., 2017).

Furthermore, researchers that included well-being as a construct conceptualised and defined well-being differently in their studies. For instance, well-being was conceptualised as psychological well-being (Ariza-Montes et al., 2018; Di-Marco et al., 2018; Ibrahim et al., 2021; Obrenovic et al., 2020), subjective well-being (Darvishmotevali & Ali, 2020; LaMontagne et al., 2016), employee well-being (Lopez-Martin & Topa, 2019; Rasool et al., 2021) and mental well-being (Leitão et al., 2018). In addition, most studies that included well-being as a construct adopted a validated measure except Skaalvik and Skaalvik (2018) who conceptualised well-being construct as emotional exhaustion, depressive mood and psychosomatic responses.

With regard to the validated measures of well-being constructs, psychological well-being was measured with the depression, anxiety and stress scale [DASS] (Ibrahim et al., 2021), general health questionnaire [GHQ-12] (Di-Marco et al., 2018; Obrenovic et al., 2020) and WHO-5 wellbeing index (Ariza-Montes et al., 2018). Also, subjective well-being was measured with the satisfaction-with-life scale (Darvishmotevali & Ali, 2020) and personal well-being index-adult [PWI-A] (LaMontagne et al., 2016). In addition, employee well-being was measured with the brief index of affective job satisfaction [BIAJS] (Lopez-Martin & Topa, 2019) and mental well-being was measured with a mental well-being scale (Leitão et al., 2018).

Moreover, well-being was explored as a mediating variable by some researchers. For instance, some researchers used well-being as a mediating variable between job demands and engagement (Lopez-Martin & Topa, 2019; Rasool et al.,

2021; Skaalvik & Skaalvik, 2018) and between job demand and job performance (Chung et al., 2015; Darvishmotevali & Ali, 2020; Zhou et al., 2020), and between job resources and job engagement (Skaalvik & Skaalvik, 2018).

It was also evident that job demand was conceptualised by researchers as workload or physical and psychological demands (Mudrak et al., 2018), work-family conflict (Mudrak et al., 2018; Obrenovic et al., 2020), job insecurity (LaMontagne et al., 2016; Mudrak et al., 2018), workplace injustice (Juvani et al., 2018; LaMontagne et al., 2016), challenging and hindrance demands (LaMontagne et al., 2016; Li et al., 2017), job strain and effort-reward imbalance (Juvani et al., 2018) and long working hours (LaMontagne et al., 2016). On the other hand, job resource was conceptualised as organisational support (Ariza-Montes et al., 2018; Guo et al., 2019; Kantan et al., 2019; Rasool et al., 2021; Tziner et al., 2015), social support (Di-Marco et al., 2018; Skaalvik & Skaalvik, 2018), job autonomy (Di-Marco et al., 2018; Gardner, 2020), role clarity (Gauche et al., 2017), good leadership and organisational justice (Brauchli et al., 2015; Heffernan & Dundon, 2016), and job control (Ibrahim et al., 2021; Nigatu & Wang, 2018).

Despite the various conceptualisation of job demands and resources, most researchers measured job demands and resources using the Job Content Questionnaire [JCQ] (Gómez-Ortiz et al., 2018; Ibrahim et al., 2021; Juvani et al., 2018; Leitão et al., 2018; López Gómez et al., 2019; Lopez-Martin & Topa, 2019) and Copenhagen psychosocial questionnaire (Baka & Baka, 2015; Mudrak et al., 2018). Furthermore, some researchers also investigated the joint effect of job demands and job resources where job resources buffered the relationship between job demands and psychological well-being (Ariza-Montes et al., 2018; Di-Marco et al., 2018; Ibrahim et al., 2021; O'Brien et al., 2016), job demands and safety

participation (Guo et al., 2019), discriminatory work environment and psychological well-being (Di-Marco et al., 2018; O'Brien et al., 2016). Job resources were mostly used as moderating variables in a study that investigated the impact of psychosocial work environment on employee outcome (Lesener et al., 2019). Most studies that have been reviewed regarding the effect of job demands and job resources on wellbeing and performance or safety outcomes come from outside Africa. Perhaps, this might be as a result of neglect of psychosocial work factors as a critical and modern workplace OHS issue in Africa. Furthermore, the inconsistency in measuring constructs of job demands, job resources and well-being make it difficult to compare studies.

Designing a workplace with enough and relevant job resources may be a contemporary and multidimensional strategy to improve workers' well-being without necessarily abandoning or sacrificing productivity. Furthermore, the review revealed that leadership quality practices that prioritise the well-being and safety of workers end up improving both employee productive outcomes and well-being. In addition, job demands were consistently linked to impaired well-being and performance outcomes. It is well established in the literature that job resources were more directly linked to work-related attitudes such as job engagement, performance, job satisfaction and organisational commitment. Finally, when job resources are utilised as a buffer, the effect of job demands on work-related attitudes, health, well-being and performance of workers is reduced significantly.

Relationship among PSC, Well-being and Job Performance

PSC is an essential psychosocial work factor that has shown effectiveness in enhancing or improving workers' safety, psychological health and well-being (Yulita et al., 2016). PSC is a job resource that reduces the effect of job demand on

the well-being and performance of employees (Yulita et al., 2016, 2014). Various studies have consistently shown that organisations with low or no PSC may experience worse psychological health and impaired performance outcomes (Dollard et al., 2019).

Bailey, Dollard and Richards (2015) studied the standard level of PSC to predict job strain and psychological distress among 1,081 Australian employees. The researchers found that PSC significantly predicted job strain and depression. Using a PSC range between 12 and 60, the researchers reported that managers or organisations who could raise the PSC level above 37 among workers may reduce job strain by 14 per cent and depression could be reduced by 16 per cent. These findings can be used as a benchmark by regulatory bodies and industries to develop a safe and healthy workplace for all workers for improved mental well-being. Perhaps, PSC may give workers the platform to deal with all forms of workplace abuse and hostile work environment, reduce injury compensation claims and create avenue for workers to report minor injuries (Dollard et al., 2019).

In another study, Bailey, Dollard, McClinton and Richards (2015) explored the role of psychosocial factors in occupational injuries compensation claims. This longitudinal study sampled 1,095 Australian workers. PSC was related to psychosocial risk factors (violence, harassment, bullying and pressure at work) which in turn predicted MSDs, emotional exhaustion and employees' compensation claims. The findings from this study suggest that OHS practitioners, legislators and policymakers should be aware that psychosocial work factors may be evident in workers' physical health issues and compensation claims. A similar study was conducted by Zadow, Dollard, McClinton, Lawrence and Tuckey (2017) when they examined how PSC affects reported and underreported physical and psychological

workplace injuries among 214 hospital workers in Australia. The researchers found that PSC strongly predicted emotional exhaustion which resulted in high self-reported injuries at work and under-reported physical and psychological injuries. PSC may be the plausible target if management or an organisation wants to reduce all sorts of injuries in addition to the unreported workplace injuries. Perhaps, an organisation with high PSC may significantly reduce under-reported injuries as a result of the robust downward and upward communication between management and workers at all levels of the organisation.

Furthermore, PSC may also be useful in improving the safety behaviours of workers when working in work environments with high job insecurity. For example, in the study by Bronkhorst (2015) among 6,230 healthcare workers across 52 health institutions in the Netherlands, high PSC significantly moderated the association between job insecurity and safety behaviours. This means that high PSC among workers plays a moderating role by buffering the impact of job insecurity on safety behaviours. This finding further confirms that improving the PSC of an organisation may improve the safety behaviours of workers. Perhaps, PSC serves as an essential target to improving the negative psychological health outcomes especially in a high-job-demand environment or when a worker is experiencing uncertainty at work.

PSC may not only help to improve safety behaviours at work but it would also be an essential resource in improving other performance outcomes. For instance, Bronkhorst and Vermeeren (2016) investigated the association between PSC and health performance outcomes. The researchers sampled 8,761 workers in 177 healthcare organisations in the Netherlands. The researchers completed a multilevel analysis and reported that PSC was associated with high emotional

exhaustion, presenteeism and absenteeism. In addition, the researchers reported that low PSC was significantly associated with high MSDs. Consequently, the researchers reported that workers with high MSDs reported higher healthcare utilisation. PSC does not only promote and protect the psychological well-being and safety of workers but also reduces or eliminates impaired health performance outcomes such as presenteeism, absenteeism and utilisation of health care which may affect productivity.

PSC may also provide enough resources and avenues, manage and eliminate all forms of abuse at the workplace. For example, Nguyen, Teo, Grover and Nguyen (2017) explored PSC and its relationship with bullying at the workplace. The researchers sampled 274 public sector workers in Vietnam. The researchers found that PSC was significantly and negatively related to workplace bullying. The researchers further reported that high PSC played a moderating role by serving as a buffer on the effect of bullying on employee engagement. Finally, the researchers reported that PSC was a stronger predictor of workplace bullying and work engagement than organisational support (conceptualised in the study as a related construct to PSC). Though the researchers used a smaller and unrepresentative sample, the findings imply that senior management in industries must prioritise policies, strategies, procedures and proactiveness to effectively and cohesively promote PSC for the elimination and prevention of all forms of workplace violence and abuse.

PSC may affect workers' mindfulness which is a critical mental health state. Lawrie, Tuckey and Dollard (2018) explored PSC and work conditions as predictors of everyday workers' mindfulness. The researchers sampled 57 employees in education, health care and finance. Through hierarchical linear

modelling, the researchers found that high psychological demand is significantly and negatively related to mindfulness. Also, the findings showed that as PSC improved, job control became a positive and significant predictor of mindfulness. These findings show that jobs must be designed with manageable and flexible demands and tasks that allow individuals to have control which will allow creativity and skill discretion to support workers' everyday mindfulness at work. It can also be deduced from the study findings that workplace policies and strategies designed to improve workers' health and well-being may not be sustained if workers do not have control over their job. Perhaps, with adequate control, high PSC perceived by employees will be essential in improving workers' health and well-being.

High level of PSC is need in an organisation to reduce or prevent workers' exposure to chronic and non-communicable occupational diseases (Dollard et al., 2019). For example, in a longitudinal study among 1,223 general working population in Australia, Becher, Dollard, Smith, and Li (2018) examined PSC as a risk factor for heart diseases such as myocardial infarctions, hypertension and angina. The data collected were analysed using logistic regression and the findings showed that high PSC was a strong predictor of heart diseases at follow-ups. Thus, workers in a low PSC work setting were 59% more likely to have new heart diseases than those in a high PSC work setting. The researchers further reported that high PSC remained a strong predictor of low heart disease risk at follow-ups after adjusting for known risk factors in job designs such as ERI and job strain. Hence, work settings that prioritise PSC stand the chance of protecting the workers from circulatory diseases and other related occupational chronic diseases of the heart.

PSC plays a major role as a contextual factor in an organisation as additional job resource (Dollard et al., 2019). For instance, in a study by Loh, Idris, Dollard

and Isahak (2018), two mechanisms were explored. PSC as a bolstering resource or resource pathway and PSC as a signal for safety that supports the use of resources. Data collected from 429 Malaysian healthcare officers were analysed using hierarchical linear modeling. The researchers found that PSC was a significant and strong moderator of the relationship between emotional demands and psychological health issues when baseline outcomes were adjusted. Compared to job rewards and job control, PSC was a better and a strong moderator on the effect of job demand on psychological health issues. This finding showed that PSC becomes an essential job resource that compensates workers when job control and rewards are low. The researchers further reported that when PSC and job resources were low, job demands had the strongest effect on workers' psychological health. The moderating role of PSC has been confirmed in a current study by Yulita, Idris and Dollard (2020). Yulita et al. (2020) found that PSC moderated the effect of job demands on work engagement and psychological distress. This finding further confirms the assertion that in a high PSC, job resources have the capacity to reduce both workaholism and psychological distress.

PSC impacts on workers' well-being and performance have received less research attention in Africa. Up to date, few published studies have explored PSC among workers in the oil industry in Ghana. Ansah, Mintah and Ogah (2018) examined the level of PSC at fuel service stations in Accra and the ways PSC predicts the health and safety of workers. This cross-sectional survey sampled 876 fuel station attendants from 4 oil marketing companies. The researchers used the partial least squared-structural equation model for the analysis of their data. The researchers reported that PSC directly predicted the health and safety of the fuel attendants and indirectly predicted their health and safety through job resources.

The researchers further revealed that the safety, health and well-being of the fuel station attendants were improved when the managements of the stations were able to make conscious efforts aimed at improving PSC at the stations. Besides, the researchers revealed that the health and safety of the fuel attendants were improved when supervisors of the fuel station provided additional job resources for the fuel attendants.

Ansah and Mensah (2020) explored the mediating role of PSC and job resources on the effect of job demands on the health of the fuel attendants. The researchers reported that PSC and job resources provided a partial mediating role on the effect of job demand and the health of the fuel attendants. This finding further proved that when PSC and other job resources are increased significantly in a work environment, the effect of job demand on workers' health, safety and well-being is reduced significantly.

Tagoe and Amponsah-Tawiah (2019) explored the moderating role of PSC on the effect of psychosocial hazards (work stress and workplace violence and bullying) on work engagement among 543 bankers working in six commercial banks in Ghana. The researchers reported that PSC had a significant positive effect on work engagement. In addition, the researchers reported that PSC moderated the influence of workplace bullying on work engagement. This finding confirms the moderating role of PSC on the influence of job insecurity on safety behaviours (Bronkhorst, 2015). Perhaps, increasing the PSC of the work environment of the bankers may help to eliminate unhealthy workplace behaviours that have negative influence on work engagement. This finding further implies that policies and interventions that focus on improving PSC at the workplace may help to create a positive psychological work environment that eliminates or reduces significantly

the psychosocial hazards among workers in the Ghanaian baking space. This healthy and decent work environment will promote work engagement and result in increased productivity.

In sum, the review of related studies on the association among PSC, well-being and safety performance showed that if modern businesses and industries would ensure sustainability, growth and continuity then the health and safety of their workers must be prioritised. In prioritising the health, well-being and safety of the workers, management and supervisors must make conscious efforts to improve PSC and other job resources. This effort will be key in protecting and promoting workers in precarious conditions. This review further revealed that most studies that have explored PSC are outside the African continent. Hence, PSC needs further exploration especially in Africa and probably among different occupational groups. In addition, PSC has not been explored in the transport sector, specifically, among commercial road transport drivers. There is also the need for further exploration of PSC, especially the interaction between simultaneous resource climates. For example, PSC and autonomy can be explored to examine if they provide increased benefits to workers and organisations. All the reviewed studies that have explored PSC used PSC -12 scale as a measure. The PSC-12 needs more validation from different cultural and work settings and occupational groups to establish consistent psychometric properties. The consistency in the measurement of PSC makes it easier to compare and replicate studies.

Conceptual Framework

The conceptual framework of this study explores workplace psychosocial factors that influence the well-being and safety outcomes of workers. The conceptual framework is presented in Figure 2. The conceptual framework shows

the paths through which job demands and resources predict well-being and safety incidents of long-distance commercial drivers in Ghana. The hypothesised model shows linkages among latent constructs.

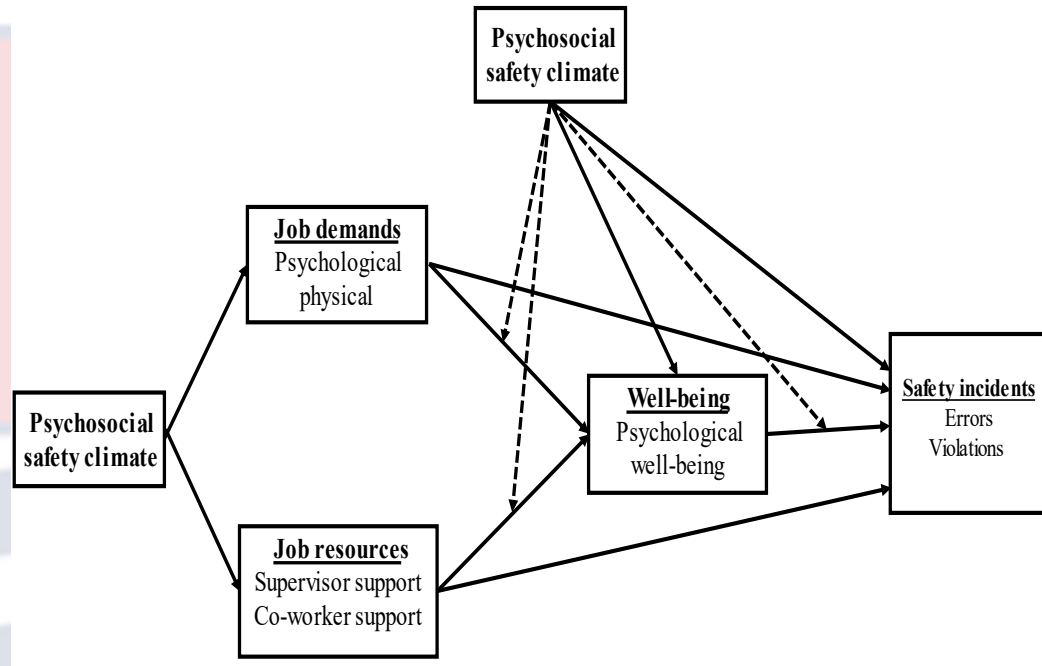


Figure 2: Conceptual framework of the effect of psychosocial work factors on PWB and SI

Ghana has no comprehensive national policy on OHS and this may manifest in various ways at various workplaces and occupational groups in the country. This lack of a comprehensive OHS policy in Ghana may result in fragmented operations among commercial transport drivers and it is likely to make the work of the commercial driver more hazardous. Perhaps, evidence points to the fact that the level of integration of OHS in public transport operations in Ghana does not measure up to standard (Atombo et al., 2017). Hence, critical and modern OHS issues such as psychosocial work factors may not be effectively tackled; this may expose commercial drivers to psychosocial hazards. Furthermore, Boateng (2021) has opined that commercial transport drivers work under precarious employment

terms in Ghana. This situation is likely to increase the work demands of the commercial drivers in Ghana. Therefore, it is prudent to examine the level of psychosocial hazards (daily hour intensity, weekly hour intensity, lonely driving, shift work, work-family conflicts, job insecurity, job demands, job resources and PSC) experienced or perceived by long-distance bus drivers in Ghana.

In addition, Job demand and resources are predictors of health-related issues, well-being, safety outcomes, and work performance (Ariza-Montes et al., 2018; Darvishmotevali & Ali, 2020; Ibrahim et al., 2021; Obrenovic et al., 2020). In the road transport sector, job demands and job resources (Llamazares, Useche, Montoro, & Alonso, 2021) affect driving performance through burnout and work engagement. The path through which job demands and job resources predict psychological well-being and safety incidents among commercial drivers is yet to be explored in Ghana. Therefore, this current study explored the paths through which job demand and resources predict psychological well-being and safety incidents among long-distance bus drivers in Ghana.

Furthermore, in the conceptual framework, psychological well-being is playing a mediating role in the effect of psychosocial work factors on safety incidents among long-distance commercial drivers. In the JD-R and PSC models, burnout, exhaustion, or strain play a mediating role in the health impairment hypothesis. The mediating constructs in the health impairment hypothesis are usually health issues that affect workers' well-being (Ariza-Montes, Arjona-Fuentes, Han, & Law, 2018). These health issues affect workers' well-being in and outside the work settings and commercial drivers are not an exception. Studies reviewed have rarely explored well-being as a mediating variable. For example, a study has reported that subjective well-being mediated the relationship between job

demands and job performance (Darvishmotevali & Ali, 2020). In another study, well-being mediated the relationship between job resources and engagement (Skaalvik & Skaalvik, 2018). Hence, this current study explored the mediating role of psychological well-being on the influence of job demand and resources on safety incidents.

In addition, PSC is an extension of work stress models such as the JD-R model. PSC is a job resource that has shown to be a predictor of job strain and psychological distress (Bailey et al., 2015), abuse at work (Nguyen et al, 2017), workplace injuries (Zadow et al., 2017), and safety performance (Bronkhorst & Vermeeren, 2016). PSC has also been shown as a strong moderator of the relationship between job insecurity and safety behaviours (Bronkhorst, 2015), bullying and work engagement (Nguyen et al., 2017) and job demands and psychological health (Loh et al., 2018). Therefore, in this current study, the moderating roles of PSC on the effect of job demand and job resources on psychological well-being were explored. Furthermore, this current study explored the moderating role of PSC on the effect of psychological well-being and safety incidents among long-distance commercial drivers in Ghana.

Again, the effect of vehicle type on the psychosocial work factors has been examined by Useche, Gómez, Cendales, and Alonso (2018). Among the three driver groups compared (taxi, city bus and inter-urban bus drivers), taxi drivers received higher job resources at work while city bus drivers experienced higher job demands. This study found that driver groups are exposed to different psychosocial work factors based on their operations and activities. Therefore, in this current study, long-distance driver groups based on bus ownership (individual, private

company and public company ownership) in Ghana will be compared to help understand the driving hour intensity associated with their daily job schedules.

Finally, studies have shown that long hours of working have a drastic effect on health performance and injuries (Friedman, Almberg, & Cohen, 2019; Kivimäki et al., 2015; Madsen & Rugulies, 2021). In the road transport industry, studies have shown that long driving hours strongly predict road traffic crashes and injuries (Useche et al., 2019), or unsafe driving behaviours (Bowen et al., 2020; Mahudin & Sakiman, 2020). Hence, it is relevant to explore if long driving hours affect safety incidents in the Ghanaian context among long-distance bus drivers.

Summary

The goal of OHS is to create a healthy and safe workplace environment, as well as working conditions that protect and promote workers' health, safety, and well-being. Furthermore, OHS takes appropriate steps and measures to protect the general public who are directly or indirectly exposed to industry and business operations. These are the objectives of executives in industries and businesses that prioritise the safety and well-being of their employees and the general public. Therefore, managers in industries and businesses that prioritise OHS gain a competitive advantage while increasing productivity, improving employee health outcomes, and lowering costs associated with occupational accidents, injuries and diseases. To achieve these OHS goals and benefits, businesses must strictly adhere to international and local standards, as well as industry best practices.

Globally, the ILO, with the help of the WHO, provide member countries with conventions, standards, guidelines, and policies to help protect and promote the health and safety of workers and the general public. Furthermore, the ILO and WHO rely on high-quality evidence from academia and practice to update and

provide member countries with relevant OHS training. Ghana is yet to comply with the ILO convention on comprehensive national occupational health and safety policy. Also, Ghana's OHS policies are fragmented and out-of-date, with poor enforcement of policy and guidelines.

Since the advent of the industrial revolution, workplace research has primarily focused on the prevention and treatment of occupational injuries and diseases. Furthermore, workplace research concentrated on biological and physical hazards, as well as worker behaviours that are precursors to occupational accidents, injuries, and diseases. Moreover, as the workplace became complex and more safety measures were introduced, OHS research focused on adherence to safety precautions and control measures. Over the last few decades, occupational health and safety research has paid close attention to psychosocial work factors that are precursors to occupational accidents, injuries, and diseases. As a result, psychosocial work stress models such as the JD-R and PSC model were developed to explain the causes of psychosocial work factors and their impact on workers' health, safety, and well-being.

The majority of research evidence on psychosocial work factors has come from the western world and few from Asia and the Pacific. Thus, few studies in Africa have explored psychosocial workplace factors that are antecedents to workers' health, safety and well-being. In Ghana, the few studies that have explored workplace psychosocial and safety factors have focused entirely on workers in the oil and gas and banking sectors. There is the need to create a safe, healthy and decent work for all occupational groups. Hence, the psychosocial work factors among workers in the road transport sector need to be explored to understand the

working conditions of the drivers that affect their psychological well-being and road traffic incidents.



CHAPTER THREE

RESEARCH METHODS

This chapter presents the research design, study area, population, sampling procedures, data collection instruments, data collection procedure and data processing and analysis.

Research Design

This study adopts a cross-sectional survey design to explore psychosocial work factors and the paths through which these factors predict the psychological well-being and safety incidents of long-distance commercial bus drivers in Ghana.

Surveys are important descriptive research methods that are effective in collecting a large amount of data from a target population like drivers using a representative sample. Thus, survey research is, perhaps, the best design available to collect primary data to describe a large population like commercial drivers that might be difficult to observe directly at their workplace (Babbie, 2021; Creswell & Creswell, 2018). Babbie (2021) argued that a survey is an outstanding method for measuring perceptions, attitudes, opinions, behaviours, and orientations in a large population. In this study, I described the perception of commercial bus drivers about psychosocial work factors and how such factors affect their well-being and safety outcomes. Therefore, a cross-sectional survey was the most reliable and appropriate research design for this study. Moreover, studies that have explored the psychosocial work factors of various occupational groups and work settings in different countries have often utilised surveys (Adil & Baig, 2018; Ariza-Montes et al., 2018; Dollard et al., 2019; Joseph, 2021; Schaufeli & Taris, 2014; Yulita et al., 2016). Also, some studies that have explored psychosocial hazards among

commercial drivers have utilised cross-sectional survey design (Alonso et al., 2020; Llamazares et al., 2021; Montoro et al., 2018; Tàpia-Caballero et al., 2021).

The use of cross-sectional survey research design comes with some challenges or limitations. First, a descriptive survey may not be effective and appropriate when investigating a diverse population or heterogeneous groups especially when the phenomenon under study is complex (Fowler, 2014). However, constructs in psychosocial work factors in this study such as job demands, job resources, and PSC are simple constructs that have received a lot of research attention in recent times (Ansah & Mensah, 2020; Alonso et al., 2020; Yulita et al., 2016; Wilton et al., 2019). Furthermore, long-distance commercial drivers are well-organised professional drivers who share similar characteristics. Second, cross-sectional surveys may not be effective when standard, valid, and reliable measures of constructs are not used (Babbie, 2021). Thus, designing a questionnaire that is least appropriate for all or most participants means that the researcher is likely to miss what is most appropriate for the majority of the participants. The current study tackles this issue in two ways: first, validated and reliable measures for all constructs are used, and second, robust statistical tools and analysis techniques were applied to the data. The use of such robust statistical tools and analysis also limits the ill effects of sampling bias, should it occur in the survey (Barbie, 2021).

The ontological foundations that underpin this research align with the positivist paradigm. The adoption of a positivist ontology is based on the researcher's belief in the existence of an objective reality. The researcher contends that the psychosocial work factors investigated in this study, including the work environment, management practices, and driver perceived psychological well-being, are objective and concrete components of the real world. This realist

viewpoint holds that these factors exist independently of individual interpretations or subjective constructions. Regardless of the specific organisations or owners of the vehicle and the drivers involved, these psychosocial work factors are viewed as universal and substantive facets of the reality experienced by long-distance bus drivers within the road transport sector. This ontological choice is motivated by the need to provide empirical, verifiable insights into the impact of these factors on safety outcomes.

The epistemological stance of this study, deeply rooted in positivism, is characterised by a strong commitment to empirical inquiry and the use of valid, reliable, and standardised measures. The researcher maintains that the psychosocial work factors affecting long-distance commercial drivers in Ghana can be accurately and rigorously studied through the direct perceptions of the drivers themselves. This outlook aligns with positivist epistemology, which advocates for the objective measurement and observation of phenomena. The use of validated measures and standardised instruments is not only a methodological choice but also a critical necessity. It ensures the credibility and trustworthiness of the data collected, reducing the risk of measurement error or subjective bias. Furthermore, the reliance on established theories or the development of hypotheses serves as a guiding framework for understanding and predicting the relationships between these psychosocial work factors and safety outcomes among long-distance bus drivers. This theoretical foundation adds depth and structure to the research, enhancing its methodological rigor.

Within the axiological framework of this study, the researcher prioritises objectivity, methodological rigor, and the minimisation of the researcher's

influence. The emphasis on objectivity arises from the understanding that reducing subjectivity and bias in the research process is paramount to the reliability and credibility of the findings. A commitment to procuring an appropriate and representative sample of long-distance bus drivers in Ghana is not only a methodological concern but also an ethical one. It ensures that the research findings are generalizable and representative of the target population, enhancing the external validity of the study. The use of valid and reliable measurement tools and the application of robust statistical analysis methods align with the positivist aspiration of producing objective, credible, and rigorous results. These axiological principles are fundamental to the production of high-quality research that contributes to a deeper understanding of the psychosocial work factors affecting safety outcomes among road transport drivers.

Study Area

The study was conducted in transport yards and stations in the Greater Accra Region (Accra and Tema). Observations conducted in the region revealed that there were about 38 transport yards and stations scattered in the business centres in Accra and Tema that have bus drivers who commute long distances on standard routes from Accra and Tema to other parts of the country and the sub-region of West Africa. Accra has about 28 long bus stations and transport yards organised into six zones (Kaneshie, Kwame Nkrumah Circle, Tudu, Madina, 37 Military hospital and Achimota). Tema has 10 stations and transport yards organised into two zones (Ashaiman and Tema). These bus stations and transport yards are managed by the Metropolitan, Municipal and District Assemblies in partnership with the driver unions such as the GPRTU (Yobo, 2014). In addition,

some private busing companies and the state-owned busing companies (Metro Mass and STC) own and operate their transport yards within the region. However, all these transport yards are located within the business centres.

The transport yards and stations in the region have buses that commute to all the regional and most district capitals within the country and the sub-region or the neighbouring countries through standard routes (Yobo, 2014). See Figure 3 showing the locations of the study (Accra and Tema), indicated with red dots. Figure 3 further shows the road transport network in Ghana and the standard routes through which bus drivers commute to their various destinations.

Accra and Tema are major transportation hubs in Ghana, serving as central points for long-distance bus travel across the country and even to neighboring West African countries. This makes them ideal locations to study long-distance bus drivers and their associated work conditions, given the high volume of commuters and substantial bus terminals in these cities. Also, Accra and Tema are well-connected to various regional and district capitals within Ghana. Additionally, they offer standard routes for buses to commute to neighboring countries in West Africa. This diversity in long-distance routes allows for a comprehensive examination of the experiences and challenges faced by long-distance bus drivers. Furthermore, Accra and Tema are not only transportation hubs but also significant urban and business centres in Ghana. Long-distance drivers operating in these areas are likely to face unique psychosocial work factors related to urban traffic, work environment, and organisational conditions. These factors can significantly impact their perceived psychological well-being and safety incidents, making these locations relevant for the study.

Population

The long-distance commercial bus drivers in Ghana who commute at least 140 kilometers (km) from Accra and Tema (Greater Accra Region) to other parts of the country and the sub-region constituted the population for the study (Nsiah-Asamoah & Buxton, 2021). These drivers work for road transport companies and individual vehicle owners in Ghana (Yobo, 2013). Furthermore, from about 38 bus terminals and stations, these buses commute to all regional capitals, most urban areas, and towns in the country, as well as neighbouring countries such as Burkina Faso, Nigeria, Togo, Mali, and Cote d'Ivoire.

In addition, Accra and Tema have direct access to four of the deadliest road networks that record the majority of road traffic accidents in Ghana [Accra-Tema to Aflao (N1), Accra-Tema to Ho (N2 and N5), Tema-Accra to Elubo (N1) and Tema-Accra to Kumasi (N6)]. There are no statistics on the population of commercial bus drivers in Accra and Tema, but the chairpersons of the various yards and stations in Accra and Tema, estimated the figures around 10,900 long-distance commercial bus drivers who commute at least 140 km to and from Accra and Tema on standard routes.

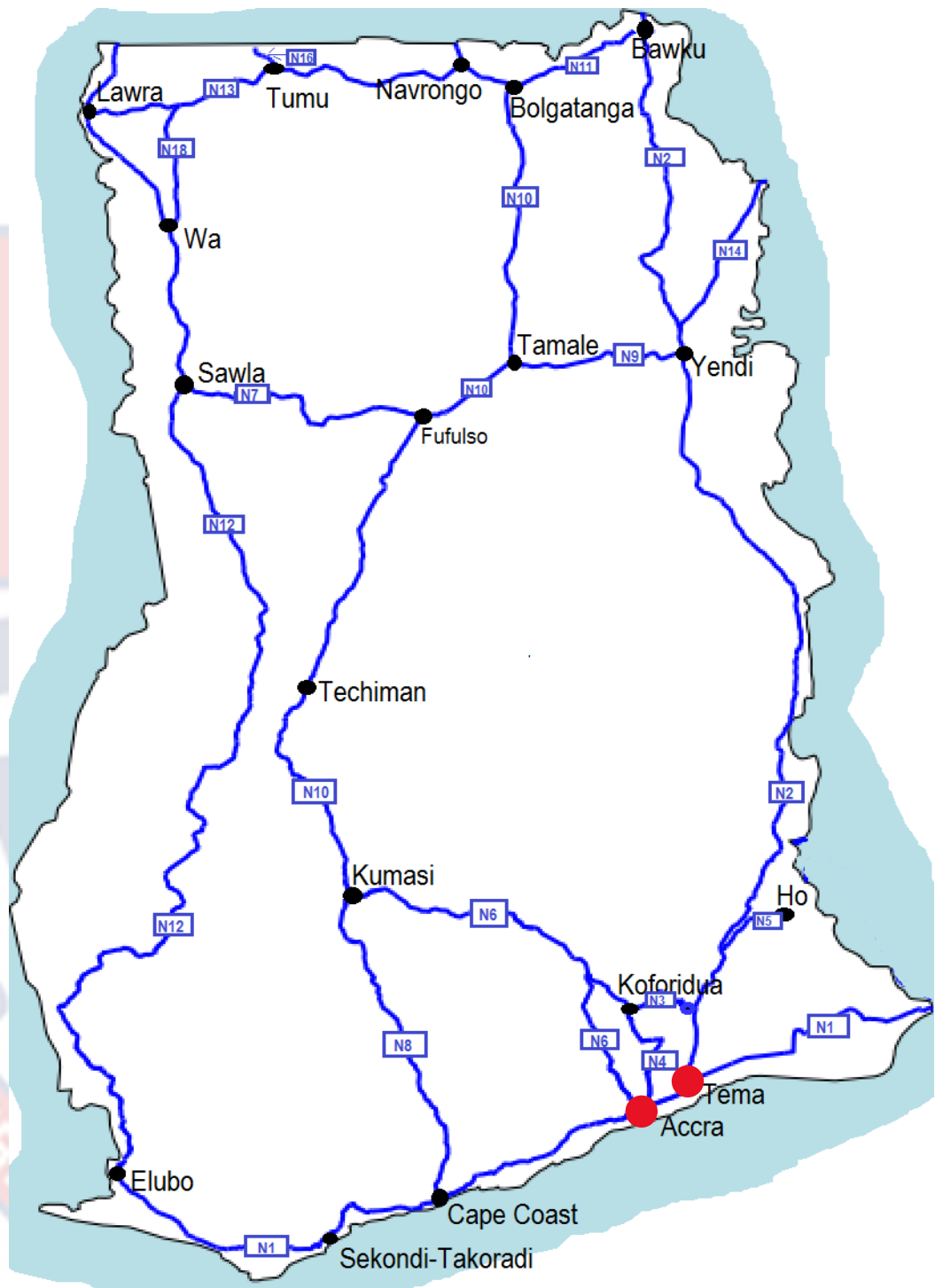


Figure 3: Ghana map showing major transport routes

Sampling Procedure

A sample of 7,315 long-distance commercial bus drivers, representing about 67.11 per cent of the total estimated population (10,900) was surveyed in this study. There was a 95.9% response rate based on an initially estimated sample of 7,630. This sample size was not based on an *a priori* assumed effect size or statistical power calculations. Typically, before determining sample size, the effect size is calculated under the assumption that the sample is taken from a normally distributed population (Mills & Gay, 2019). However, the target population's normality could not be determined before data collection in this particular study (Cohen, 1988). Moreover, Mills and Gay (2019) explained that beyond a target population of 5000, a sample of 400 is adequate for a quantitative survey. Therefore, a sample of 7,315 is a justifiable representative of the population to produce a reliable finding. Besides, Babbie (1973) has argued that a survey that samples between 60 and 70 per cent of the target population adequately represents the majority of the population and that findings and conclusions can be generalised to the entire target population.

Long-distance bus drivers were purposively selected for this study. Studies that have explored psychosocial work factors among commercial drivers have relied mostly on city bus or rapid transit bus drivers who work within cities (e.g., Chen & Hsu, 2020; Gómez-Ortiz et al., 2018) and truck drivers (e.g., Hege et al., 2019; Sekkay et al., 2021). Thus, there is less information about bus drivers who commute on long journeys; hence, the two driver groups (minibus and long bus drivers) were purposively selected. Furthermore, the MTTD has shown that long-distance bus drivers have risky driving behaviours, and account for the majority (about 36%) of road traffic crashes in Ghana. Again, the quota sampling technique

was used to determine the proportion of each driver group for the study. The relative quota ratio 72:28 for minibus and long bus drivers respectively was calculated. This was done to ensure that minibus and long bus drivers had a reasonable representation (5,260 minibus and 2,055 long bus drivers) of the total sample based on their representation in the target population.

Inclusion criteria:

1. The driver was in active work with a minibus or long bus for at least six months to data collection.
2. The driver was driving at least 140km to and from Accra and Tema.
3. The driver should be employed.
4. The driver willingly offered consent to participate in the study.

Exclusion criteria include:

1. The driver had worked less than 6 months before data collection.
2. The driver had known mental health issues.
3. Drivers that own the buses they drive.

Finally, drivers who met the inclusion criteria were sampled conveniently at the various loading stations and transport terminals in Accra and Tema. These stations and yards are dispersed throughout the two cities, but the two driver groups coexist in the same yard or station. Furthermore, new drivers join the various stations daily, while some depart. In addition, some drivers may spend a week or more away before returning to the loading station or transport yard. Again, drivers at these stations were either about to go on their trips or had arrived and resting or loading for the trip. Therefore, it was difficult or impossible to do random sampling of these drivers.

Some researchers have argued that studies that use non-probability sampling methods such as purposive, quota, and convenient sampling are limited in their ability to generalise study findings and conclusions (Babbie, 2021; Fowler, 2014). However, the non-probability sampling method is common in OHS research (Dollard et al., 2019; Yulita et al., 2016) and studies that have explored psychosocial work factors in the transport driver population (Brodie, Pavey, Newton, & Sendall, 2021; Montoro et al., 2018; Nævestad, Phillips, Laiou, Bjørnskau, & Yannis, 2019), and the results, findings, and conclusions from these studies are valid and generalisable to the populations. Therefore, the ability to generalise the findings from the current study cannot be undermined.

The participants comprised 7,256 (99.2%) males and 53 (0.7%) females, but six (0.1%) did not identify themselves as males or females. The age of the participants ranged between 19 and 64 years ($M = 39.07$, $SD = 7.85$). In addition, 952 (13%), 3,647 (49.9%), 1,265 (17.3%), 1,227 (16.8%) and 224 (3.1%) participants had no formal education, basic education, vocational training, secondary education and tertiary education, respectively. Also, the participants had between one and 47 years of driving experience ($M = 12.07$, $SD = 6.82$). Out of the 7,315 participants, 97 (1.3%) did not have a driver's license, whereas 466 (6.4%) were driving with expired license. Moreover, 1,024 (14.0%), 3,911 (53.5%), 1,602 (21.9%), 222 (3%) and 460 (6.3%) of the drivers were holding class B, C, D, E, and F license categories, respectively, but 96 (1.3%) did not respond to this question. Also, out of the 7,315 participants, 71.9% were mini-bus drivers whereas 28.1 per cent were long-bus drivers.

Participants drive between 5 hours and 19 hours ($M = 9.48$, $SD = 3.62$) daily. Furthermore, 774 (10.6%), 1,931 (26.4%), 3,456 (47.2%) and 1,154 (15.8%) worked

4, 5, 6 and 7 days, respectively, in a week. In addition, 4,617(63.1%), 982(13.4%) and 1,716 (23.5) of the participants were working under the permanent, fixed term and under casual employment contracts. Besides, 2,128(29.1%), 828(11.3%) and 4,359(59.6%) were driving vehicles owned by private companies, public companies (Metro Mass and STC) and individuals, respectively. In terms of safety incidents, 229(3.1%) of the participants had not experienced near misses for two years before the data collection, whereas 7,086(96.9%) reported at least one near-miss incident ($M = 3.81$, $SD = 3.18$). Finally, 3,387(46.3%) of the participants had not experienced any form of road accident, whereas 3,928 (53.7%) experienced at least one or more road accidents two years before the data collection.

Data Collection Instrument

A questionnaire was used to survey the drivers. The questionnaire was in sections A, B, C and D. Section A solicited information on gender, age, level of education, years of driving experience, weekly working hours, vehicle type, employment contract type, shift work, and history of accidents and near misses (with 15 items, 1-15).

Section B collected information about the psychosocial work factors, with items adopted from pre-existing instruments, Job Content Questionnaire [JCQ] (Karasek, Brisson, Kawakami, Houtman, Bongers, & Amick, 1998), PSC-12 (Hall et al., 2010) and work-family conflict scale [WAFCS] (Haslam, Filus, Morawska, Sanders & Fletcher, 2015). The first part of the JCQ (items 16 to 27) measured job demands (items 16 to 22) and job resources (items 23 to 27). The JCQ has been validated among professional drivers (Useche et al., 2021). The items in the job resources ($\alpha = 0.86$, composite reliability (CR) = 0.91) and job demands ($\alpha = 0.92$ and CR = 0.95) are reliable measures (Ansah, 2017; Montoro et al., 2018; Useche

et al., 2019). Some of the items include, “*My job requires hard work all the time*” and “*People I work with are competent to do their job*”.

Job insecurity was measured with three items (28-30) on the original JCQ (Karasek et al., 1998). “*My job security is good*” is an item measuring job insecurity. The responses on the JCQ are strongly disagree (1) to strongly agree (4). A high cumulative score on the JCQ gives a relative indication of the presence of job resources and demands. Existence of high job resources suggests that both the co-workers and supervisors’ collective support is likely to be adequate. However, a high job demand indicates a harsh physical and psychological demands on the bus drivers.

The organisational level PSC of the drivers was measured using the PSC-12, in the second part of section B (with items 31-42). PSC-12 in this study measures the commitments and priority that car owners, management of transport companies, station masters and driver unions give to the psychological well-being and safety of the drivers as well as communication and involvement of drivers in safety issues. PSC-12 has a high internal consistency (α of 0.94 and CR of 0.95). For instance, “*In my workplace senior management/car owner acts quickly to correct problems/issues that affect employees psychological health*” is an item on the PSC-12, with response options of Strongly Disagree (1) to Strongly Agree (4). Using the benchmark of Sobel (1982), the PSC of drivers was classified into high (score 41 and above), moderate (score 37.00 to 40.99) and low (score 36.99 and below), with a high score representing a low risk of PSC. High PSC indicates that bus drivers are involved in the jobs and their well-being and safety are prioritised by their supervisors or car owners. On the other hand, a low PSC bus drivers’ well-being and safety are not the priority of management of bus transport companies,

and car owners and drivers are the least involved in designing their daily work schedules. The items measuring PSC were adapted (“car owner” was added to the items) to make the items contextually relevant. For instance, “*In my workplace senior management acts quickly to correct problems/issues that affect employees*” is an example of the original item measuring PSC. However, this item was modified to read “*In my workplace senior management/car owner acts quickly to correct problems/issues that affect drivers/employees*”.

The last part of section B (items 43-47) used the WAFCS to measure drivers' work-family conflict, which is said to be reliable with alpha of .91 and composite reliability of .94 (Haslam et al., 2015). “*My work has a negative impact on my family life*” is an item on the scale. Responses range from strongly disagree (1) to strongly agree (4), where a high score denotes a higher risk of conflict. Section C (48-52) collected information on drivers' psychological well-being using the WHO-5 (WHO, 1998). WHO-5 is a reliable measure of subjective psychological well-being with Cronbach's alpha values of .91 and composite reliability of 0.95 (Topp, Østergaard, Søndergaard, & Bech, 2015). “*I have felt cheerful and in good spirits*” and “*I have felt calm and relaxed*” are items on the scale. Drivers who attained high scores denote superior or better psychological well-being.

The last section, D (53-57) measures the safety incidents of drivers, using an adapted 21-item Driver Behaviour Questionnaire [DBQ] (Useche et al., 2019). Only five items (3 items on the violation subs-scale and two items on the error subs-scale) are used to measure errors and violations among long-distance drivers in the current study. The DBQ was originally developed by Reason, Manstead, Stradling, Baxter, and Campbell (2011) to assess risky behaviour among driver groups, which is an indicator of safety incidents, outcomes and driving performance. The scale is

divided into two sub-scales (driving errors and violations). “*Fail to check your rearview mirror before pulling out, changing lanes, etc.*” is an example of a driving error, while “*Take a chance and cross on red lights*” is an example of a violation. The scale is reliable ($\alpha = .839$, CR = 0.93) with responses ranging from hardly ever (1) to nearly all the time (5). High aggregated scores on the DBQ indicate risky driving behaviour and high safety incidents.

Pretesting of instruments

Regardless of how carefully a researcher designs a questionnaire, there is a possibility of errors such as ambiguous questions, violation of rules, questions that participants cannot answer and challenges with the arrangement of items. One of the surest ways to guard against such errors is through pretesting the questionnaire using a very similar group of participants. In addition, pre-testing the study is a critical way to test research questions and/or hypotheses before the main study. Thus, pretesting of the study was done by conducting a survey interview with 173 city bus drivers in the Takoradi Metropolis. Drivers who can read, understand, and answer the questions were given three days to return the filled questionnaire. However, drivers who had difficulty with reading, understanding, and responding to the questions were assisted by trained research assistants. Analyses were done using the SPSS version 25 and Smart-PLS3.9.9 software, examining the construct validity, alpha coefficient, composite reliability, and discriminant validity to test the psychometric properties of scales.

Construct validity of instruments

The questionnaire items were selected from different instruments and some items were modified to suit the context and population of this study. Hence, establishing the validity of the questionnaire was essential. Before pretesting, a 67-

item questionnaire was submitted to two industrial hygienists and one industrial psychologist for review. They recommended the addition of the words “car owner” to the items measuring PSC. Moreover, comments on item ambiguity and grammatical errors were made for corrections. A similar review was carried out by two OHS academics at the University of Cape Coast, Ghana. These reviews led to the reduction of items from 67 to 57.

The pretesting was done using the Confirmatory Composite Analysis [CCA], with smart PLS software version 3.9.9. The convergent and discriminant validity of the instruments measuring job demands (JD), job resources (JR), PSC, psychological well-being (PWB) and safety incidents (SI) were established (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). According to Hair et al. (2014) constructs' outer loadings of 0.7 and average variance extracted (AVE) of 0.50 are acceptable for convergent validity. All constructs used for the CCA analysis produced acceptable AVEs. Hence, the convergent validity of the instruments was established with the pre-test data. The AVE of the construct also ranged from .683 to .817 (see details in Table 1).

Table 1: Average Variance Extracted (AVE) of constructs

Constructs	Cronbach's Alpha (α)	Composite Reliability (CR)	AVE
JD	0.956	0.964	0.791
JR	0.93	0.948	0.785
PSC	0.957	0.963	0.683
PWB	0.94	0.951	0.796
SI	0.944	0.957	0.817

To establish validity of the instrument, Fornell and Larcker's (1981) criterion and Heterotrait-monotrait ratio of correlations (HTMT) were also used to assess the discriminant validity of the constructs. Accordingly, the square root of the AVE of a construct must be higher than the correlation between the construct and any other construct. Once again, the discriminant validity of the constructs was established (see details in Table 2).

Table 2: Fornell and Larcker (1981) Criterion for Discriminant Validity

Construct	JD	JR	PSC	PWB	SI
JD	0.889				
JR	-0.091	0.886			
PSC	-0.012	0.834	0.826		
PWB	-0.061	-0.05	-0.053	0.892	
SI	0.777	-0.025	0.004	-0.182	0.904

Furthermore, Hair et al. (2014) recommended using the Heterotrait-monotrait ratio of correlations (HTMT) to further evaluate the discriminant validity of the constructs since constructs were reflectively modelled. Thus, if a value of HTMT is less than one, then discriminant validity is established between two reflective constructs (Henseler, Ringle, & Sarstedt, 2015). The current values of HTMT (between .08 and .88) are all below one (see details in Table 3).

Table 3: Heterotrait-monotrait Ratio of Correlations of Constructs

Constructs	JD	JR	PSC	PWB	SI
JD					
JR	0.128				
PSC	0.132	0.88			
PWB	0.083	0.08	0.101		
SI	0.813	0.071	0.112	0.168	

Reliability of the instruments

Though the instruments are reliable and mature, it was essential to further assess the reliability of the instruments if they produce consistent outcomes over time in different contexts and populations (Hair, Howard & Nitzl, 2020). Hence, the internal consistency reliability of the items was assessed using the pilot data. In assessing the reliability of the measures, CR was used and item outer loadings of at least 0.7 are acceptable (Hair et al., 2014). Relying solely on Cronbach's alpha to establish reliability could pose a challenge because alpha relies on the idea that the items are accurately measured without errors, a condition that does not apply in research. Additionally, alpha presumed that all items load at the same rate (Hair et al., 2020). These assumptions make alpha a weak indicator of instrument reliability. Hence, CR becomes the robust method for establishing variable reliability in the current study. The initial outer loading of the item SI_3 was below the cut-off value of .07; thus, it was removed from further analysis. Table 4 presents the constructs' outer loadings and CR. The outer loadings and CR of JD (.96), JR (.94), PSC (.96), PWB (.95) and SI (.95) were acceptable (Hair et al., 2014).

Table 4: Item listings, Cronbach's Alpha (α), Composite Reliability (CR) and Outer Loadings for Five Constructs; JD, JR, PSC, PWB and SI

Constructs	Outer loadings				
	JD	JR	PSC	PWB	SI
JD ($\alpha = .95$; CR = .96)					
JD_1	0.87				
JD_2	0.91				
JD_3	0.94				
JD_4	0.87				
JD_5	0.91				
JD_6	0.91				
JD_7	0.81				
JR ($\alpha = .93$; CR = .94)					
JR_1		0.81			
JR_2		0.91			
JR_3		0.94			
JR_4		0.83			
JR_5		0.93			
PSC ($\alpha = .95$; CR = .96)					
PSC_1			0.80		
PSC_2			0.86		
PSC_3			0.90		
PSC_4			0.79		
PSC_5			0.87		
PSC_6			0.88		
PSC_7			0.76		
PSC_8			0.86		
PSC_9			0.80		
PSC_10			0.84		
PSC_11			0.78		
PSC_12			0.78		
PWB ($\alpha = .94$; CR = .95)					
PWB_1				0.96	
PWB_2				0.93	
PWB_3				0.94	
PWB_4				0.71	
PWB_5				0.90	
SI ($\alpha = .94$; CR = .95)					
SI_1					0.85
SI_2					0.94
SI_4					0.91
SI_5					0.91
SI_6					0.91

Data Collection Procedures

To commence data collection, ethical clearance was sought and it was granted by the University of Cape Coast (UCC) Institutional Review Board (ID: UCCIRB/CES/2022/82). In addition, an introductory letter was issued by the Department of Health, Physical Education and Recreation (HPER). The research team was granted ethical clearance by UCC-IRB, and an introductory letter from HPER facilitated their introduction to different driver unions, bus companies, station masters, administrators, and long-distance commercial drivers in Accra and Tema. Bus transport yards or stations were put into 8 zones: Kanashie, Kwame Nkrumah Circle, Tudu, Madina, Thirty-Seven, Achimota, Tema, and Ashaiman, for the data collection, which lasted six weeks.

The survey instrument was translated into Twi by a language specialist, to make sure that drivers who have challenges understanding the English language will not be ignored. Besides, Twi language seems the most popular spoken language in Accra and Tema so it was believed that at least most of the drivers would understand it.

Twenty (20) field assistants (FAs) were recruited for this study. The FAs were trained on the purpose of the study as well as on how to interact with the station masters and drivers. Most importantly, they were trained on how to conduct survey interviews and assist drivers who were unable to read and/or understand the items without leading the drivers to provide answers. During training, the FAs were made to conduct interviews among themselves in English or Twi. FAs were also taught how to separate their judgment from question interpretation. Furthermore, each FA was made to conduct interviews with at least three drivers who work as professional drivers at UCC. The inter-rater assessment was done and feedback and

comments were given to each FA for improvement. Training of FAs lasted for three days. Finally, FAs were trained to remain neutral and to treat each respondent's answer as legitimate regardless of the response from the driver. Field assistants were trained in didactics and practice in the assessment and management of psychological or emotional distress. This training involved instruction about verbal and nonverbal cues that could be observed while interacting with a respondent (driver) (which include sniffing, sign of fatigue, and vocal changes). Field assistants were also trained on actions they needed to take if any of these behaviors occurred. The training was done by the principal researcher and a clinical psychologist.

The 20 FAs were divided into two teams, with 10 of two each assigned to four zones. Also, each team spent one week at each of the four assigned zones. For instance, team A spent one week each in Kaneshie, Kwame Nkrumah Circle, Tudu and Madina. The teams then used one week to do a mop-up at their various zones.

Informed consent forms were made available to the participants and each driver had to sign or thumbprint to take part in this research. The drivers were made to understand that their involvement in this research was voluntary. They were also made to understand that they have the right to skip any questions or pull out of the study at any point in time without any penalty. In addition, the drivers were assured of confidentiality and anonymity of their information and that under no circumstance were their identities such as names, and company names to be revealed. Survey interviews were done with drivers who gave consent and were less busy to participate in the study. There was no cash or in-kind compensation for their participation in the study.

Data Processing and Analysis

Data analysis began with screening for the incompleteness of the data, checking missing values as well as univariate and multivariate outliers in the dataset with frequency distributions and box plots. Missing data for quantitative data were replaced with their serial means whereas the median of nearby points was applied to categorical missing data (Mertler, Vannatta & LaVenita, 2021). To test for the normality of the data, histograms were used which revealed that the data was normal. Homogeneity of variance was assessed using Levens's test of equality of error variance. However, homogeneity of variance could not be assumed for PSC, SI, JD, JR and PWB. Therefore, bus drivers who drive 140 kilometers and more from Accra and Tema constitute a heterogenous population from where participants for this study were drawn (Babbie, 2021).

Research question 1: What is the level of psychosocial hazards confronting long-distance commercial drivers in Ghana?

The aim of research question one was to identify the levels of JD, JR, work-family conflict, lonely driving, shift work, job insecurity, PSC, daily driving hours and weekly driving hours among long-distance commercial drivers in Ghana. The benchmarks proposed by Sobel (1982) were used to classify PSC-12 into high (41 and above), moderate (37 to 40.99) and low (36.99 and below). A high score represents a low risk of workplace psychosocial climate and vice versa. Furthermore, long-distance commercial drivers were categorised into low, moderate, and high driving hour intensity based on their weekly working hours (daily working hours multiplied by weekly working days). Time of 40 or less, 41-52, ≥ 53 hours per week represents low, moderate, and high weekly driving hour intensity. Daily driving hour intensity was categorised into low (8 hours and

below), moderate (9-11 hours) and high (12 hours and above). In addition, the mean scores of drivers on job insecurity (10.2), work-family conflict (16.8), JR (15.5) and JR (17.5) were used to categorise them into low and high risk (Dollard et al., 2010).

Research question 2: What is the difference in safety incidents according to weekly hour of driving intensity among long-distance commercial drivers in Ghana?

Research question two examined whether differences in categories of safety incidents exist because of weekly driving hour intensity among long-distance commercial drivers. There is one independent variable [weekly driving hour intensity] measured on three levels (40 or less, 41-52 and 53 or more), and one dependent variable, SI (errors and violations) that are ranked scale. Therefore, the most appropriate tool for this analysis was the Kruskal Wallis H Test. I checked the shapes distributions of the scores in each group to decide whether to compare the median of SI for the three groups of weekly driving hour intensity or to compare their mean ranks. The shapes of distributions were different; hence, the mean ranks were used for the analysis. The Chi-Square (X^2), degree of freedom (df) and the significance level, P -value, were the key statistics reported. Then pairwise test with Bonferroni adjustments was carried out to compare drivers' weekly driving hour intensity. Then pairwise test with Bonferroni adjustments was carried out to avoid pairwise error. The effect size (η^2) was also used to assess the magnitude of practical difference that exists across the groups, using 0.1, 0.3 and 0.5 to denote small, medium and large, respectively (Cohen, 1988).

Research question 3: What is the difference in weekly driving hour intensity according to bus ownership among long-distance commercial drivers in Ghana?

Research question three examined whether differences in weekly driving hour intensity (DV) exist because of categories of bus ownership (private company, public company and individual ownership). Though the DV is measured on a ratio scale, it violates the homogeneity of variance assumption suitable for one-way analysis of variance; therefore, the Kruskal Wallis H Test was applied. I checked the shapes distributions of the scores in each group to know whether to compare the median of safety incidence for the three groups of weekly driving hour intensity or to compare their mean ranks. The shapes of distributions were different; therefore, the mean ranks were reported. The Chi-Square (X^2), degree of freedom (df) and the significance level P -value were the key statistics reported. The pairwise test with Bonferroni adjustments was used to compare bus ownership groups and the accompanying η^2 reported.

Research question 4: What is the extent to which job demands, job resources and PSC predict psychological well-being and safety incidents of long-distance commercial drivers in Ghana?

Research question four explored the extent to which psychosocial work factors predict psychological well-being and safety incidence among long-distance commercial drivers (see Figure 4). The IVs (exogenous variables) in the model are JD, JR, and PSC whereas PWB and SI are the DVs (endogenous variables). Psychological well-being is an endogenous construct in the model, but it is found between two constructs; hence, it was considered an IV (Hair et al., 2014). All the constructs in the model are quantitative latent variables measured with quantitative indicators and were reflectively modelled (all arrows pointing to the indicators).

Therefore, PLS-SEM became the best tool for the analysis. In the first step, the inner and outer models were specified (Ringle, Sarstedt & Straub, 2012).

In the first place, the outer models (reflective models) were evaluated to confirm the reliability and validity of the constructs in the model (Hair et al., 2014). Evaluation of the outer model began with the assessment of the internal consistency reliability using CR because it provides a more accurate assessment of internal consistency than alpha (Hair et al., 2014). The reliability of indicators cross-loadings higher than 0.7 is acceptable. After the evaluation of the reliability in the outer models, there is the assessment of validity. To evaluate the validity of the outer models, the construct's convergent validity and discriminant validity were assessed. According to Hair et al. (2014), outer model loadings for each item higher than 0.70 and AVE of 0.50 are acceptable for convergent validity. Thus, an AVE of 0.50 shows that the indicators explain at least half of the variance of that particular construct.

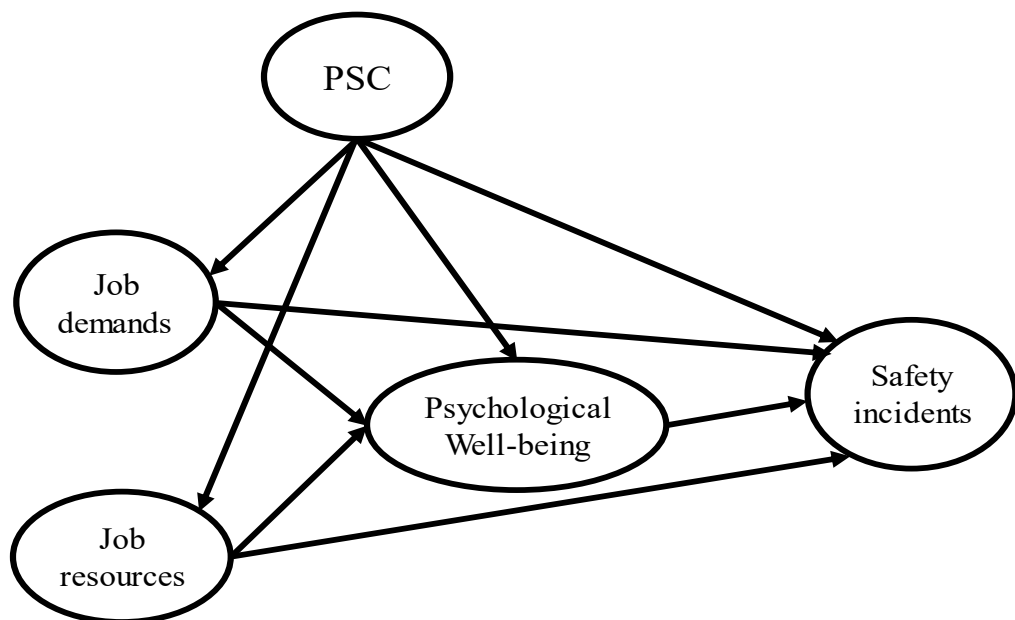


Figure 4: The power of JD, JR and PSC predicting PWB and SI

Discriminant validity was also evaluated. Discriminant validity measures how distinct a construct, such as JD, is from others, like PSC, PWB, and SI. To achieve this aim, Fornell and Larcker's (1981) criteria and HTMT were used. Fornell and Larcker's (1981) criterion assumes that a construct like JD shares more variance with its indicators than it does with JR, PSC, PWB, and SI, using the AVE of indicator loadings of each construct in the PLS model. The value of HTMT is supposed to be less than one to assume discriminant validity between two reflective constructs (Henseler et al., 2015).

The evaluation of the quality of the inner models was to determine the capacity of the exogenous construct (PSC, JB and JR) to correctly and accurately predict the endogenous constructs (PWB and SI). Four steps were followed to examine the inner models: assessment of the coefficient of determination (R^2), cross-validated redundancy (Q^2), path coefficients, and the effect size (f^2). Again, Fornell and Larcker's (1981) criterion were repeated to assess multicollinearity since the constructs are reflectively modelled.

The first step was to measure the predictive ability of the model using the R^2 where the exogenous constructs like the JD, JR and PSC were assessed. The R^2 values lie between zero and one, with one being a complete predictive accuracy of an exogenous construct. According to Hair et al. (2014), R^2 values of .25, .50 and .75 represent weak, moderate, and substantial predictive accuracy respectively. However, Hair et al. (2014) cautioned about the over-reliance on the R^2 because R^2 increases when even a weakly correlated and non-significant construct is added to the model (consistency at large). Hence, consideration is given to adjusted R^2 (R^2_{adj}) whose values are controlled when more constructs are added (Hair et al., 2014).

The Q^2 was used in the second step to assess whether the endogenous constructs (psychological well-being and safety incidents) can be predicted in the model. Thus, Q^2 values higher than zero for PWB or SI indicate a predictive relevance of such constructs in the path model. Moreover, the third step assessed the path coefficients of the inner model, the tests of hypothesised associations of the paths PSC \rightarrow PWB, PSC \rightarrow SI, PSC \rightarrow JD, PSC \rightarrow JR, JD \rightarrow PWB, JD \rightarrow SI, PWB \rightarrow SI, JR \rightarrow PWB and JR \rightarrow SI. Using the bootstrapping approach, the values of path coefficients are between positive one and negative one, and the value nearer to one represents a stronger positive and negative relationship. In addition, regardless of the strength of the association, it was appropriate to assess the significance of each path in the model using the bootstrapping method. Thus, bootstrapping enables critical and significance values for all path coefficients to be estimated. Hence, the strength of a path was considered significant if the critical value (t value) is higher than 1.96 at 0.05 p -value.

Evaluation of the f^2 ends the assessment of the inner model in PLS-SEM analysis. The f^2 represents the practical significance contribution of JD, JR and PSC in predicting the PWB and SI of long-distance commercial drivers. The f^2 of the path model was ascertained by finding Cohen's f^2 which is the changes in R^2 when a construct was excluded in the complete model. Two PLS path models were estimated to help calculate f^2 . According to Cohen (1988), the f^2 value of .02, .15 and .35 denote small, moderate, and high effect sizes respectively. Therefore, for example, if job demand strongly contributes to explaining PWB then, the difference between the $R^2_{included}$ and $R^2_{excluded}$ should be high, resulting in a high f^2 value.

Research question 5: What is the extent to which psychological well-being mediates the effect of job demand and job resources on safety incidents among long-distance commercial drivers in Ghana?

Research question five examined the mediating role of PWB (mediator) in the relation of JB and JR (the IVs) and SI (as the DV). In the mediation model, the effects of JD and JR on SI of the drivers are expected to be absorbed by the PWB (see Figure 5). The path coefficients of the direct paths (c_1 and c_2) and indirect paths ($a_1 \rightarrow b$, and $a_2 \rightarrow b$) in the PLS model were evaluated. The path coefficients are between +1 and -1 where a path coefficient of +1 indicates a perfect correlation and vice versa. The bootstrapping method was used to determine the significance of the path coefficients with or without the mediating variable (PWB), which was considered significant if the value was higher than 1.96 at .05 (Hair et al., 2021).

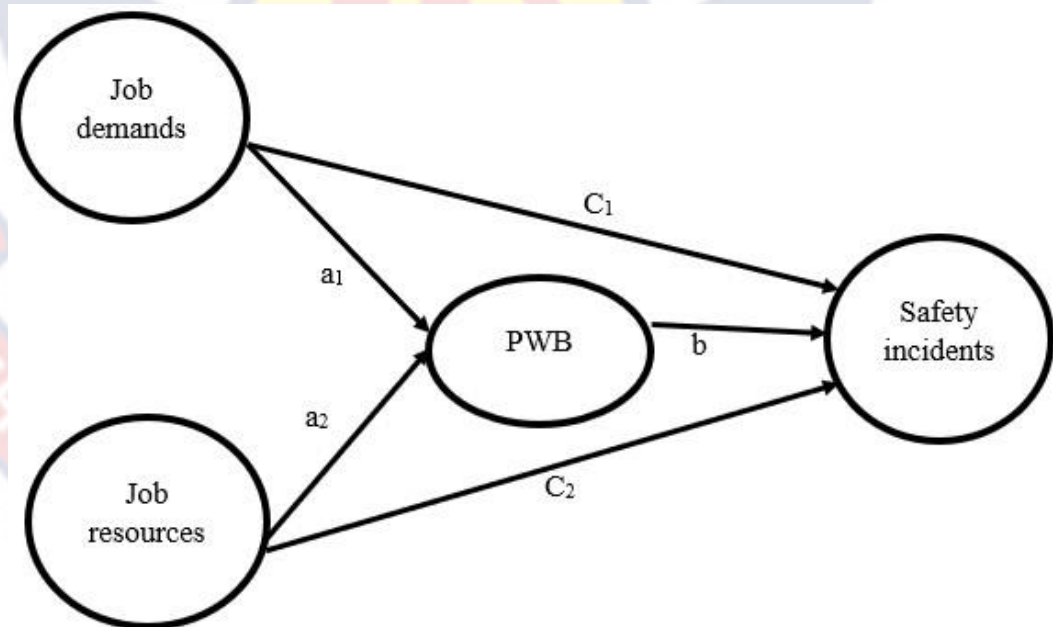


Figure 5: The mediating role of PWB on the effect of JD and JR on SI

The direct effects c_1 and c_2 need to be significant to establish the basis for evaluating the indirect effects $a_1 \rightarrow b$, and $a_2 \rightarrow b$, at values higher than 1.96 at .05 to initiate the argument for a partial or full mediation effect of PWB (Hair et al., 2021).

Thus, full mediation occurs if the significance of the paths c_1 and c_2 do not hold when PWB is introduced in the model, but partial mediation occurs if the path coefficient of paths c_1 and c_2 are still significant but reduced in the presence of the mediator, PWB.

Research question 6. To what extent does PSC moderate the influence of job demand and job resources on psychological well-being and safety incidents among long-distance commercial drivers in Ghana?

Research question 6 examines the buffering effect of PSC on the: (1) effect of JD on PWB, (2) effect of JR on PWB and (3) effect of PWB on SI. In the moderation model (Figure 6), PSC (P) is supposed to influence the association between JB (Y_1) and PWB (Y_2). In Figure 6, PSC is the moderator, JD is the independent variable and PWB is the dependent variable.

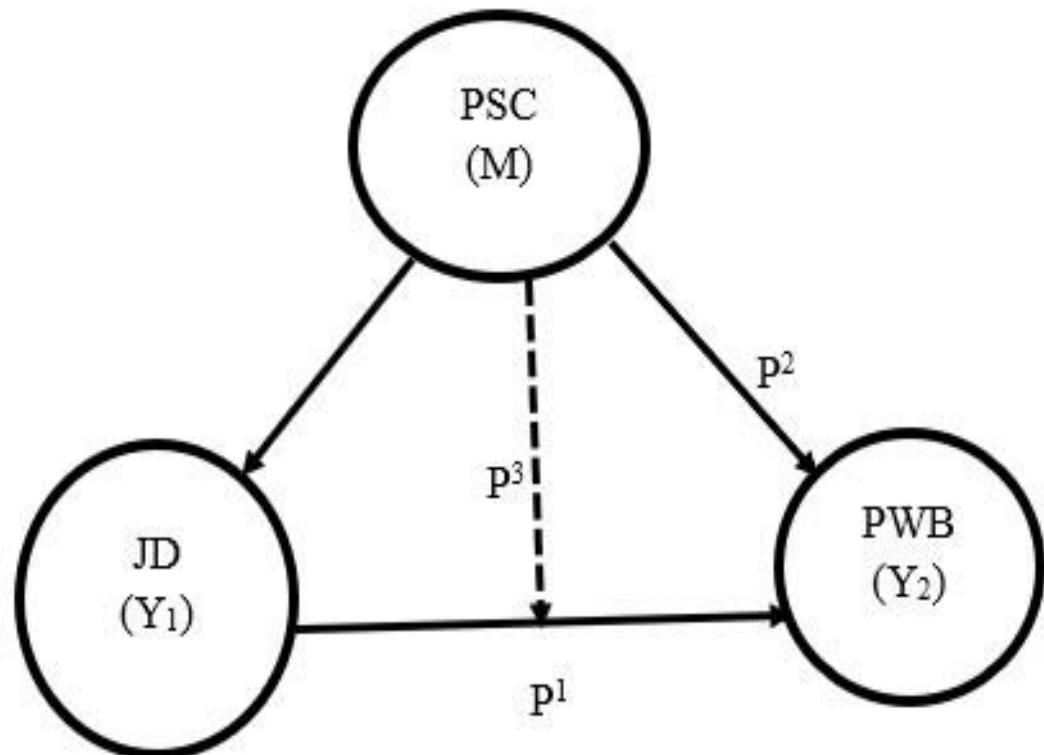


Figure 6: Moderating effect of PSC on the effect of JD on PWB

The interaction term was created using the two-stage approach (Hair et al., 2021) because JD and PSC are reflectively modelled, and the analysis aimed to determine if PSC exerts a significant influence on the association between Y_1 and Y_2 . Moreover, Hair et al. (2021) argued that this approach yields a high level of statistical power in creating an interaction term. In the first stage, the latent variable scores (LVS) for Y_1 , Y_2 and M are calculated. In the second stage, the LVS for Y_1 and M are multiplied to create the interaction term. Furthermore, the moderating model was evaluated, where the moderating variable (PSC) was assessed to make sure it meets all relevant criteria such as reliability and validity. The interaction effect (Y_1 and M) was then assessed for its significance. The assessment of the significance of the interaction effect was done using the bootstrapping procedure, and the moderating role of PSC is supported if the bootstrapping produces a significant interaction effect at *t-value* higher than 1.96, at $p = 0.05$.

Finally, the f^2 of the interaction effect was assessed to indicate the contribution the moderation makes towards explaining the PWB of the commercial drivers. The f^2 value of .02, .15 and .35 denote small, moderate, and high f^2 respectively (Cohen, 1988). However, evidence shows that testing for moderation produces an average f^2 of 0.009 (Kenny, 2018). Based on this background, Kenny proposes .005, .01 and .025 for small to large f^2 of moderation. Slope plots were used to illustrate the results of the moderation analysis.

The second part of the analysis was to examine the moderating role of PSC on the effect of JR on PWB (Figure 8). Again, the interaction term was created using the two-stage approach (Hair et al., 2021) because the analysis aimed at determining whether PSC exerts a significant influence on the association between Y_1 and Y_2 (Figure 7). At the first stage, LVS for Y_1 , Y_2 and M was calculated and

multiplied at the second stage to create the interaction term. Furthermore, the moderating model was evaluated, where the PSC was assessed to make sure it meets all relevant criteria such as reliability and validity. The interaction effect variable was then assessed for its significance. The moderating role of PSC on the influence of JR on PWB is supported if bootstrapping produces a significant interaction effect. Finally, the f^2 of the interaction effect is assessed to indicate the contribution the moderation makes towards explaining the PWB among the drivers.

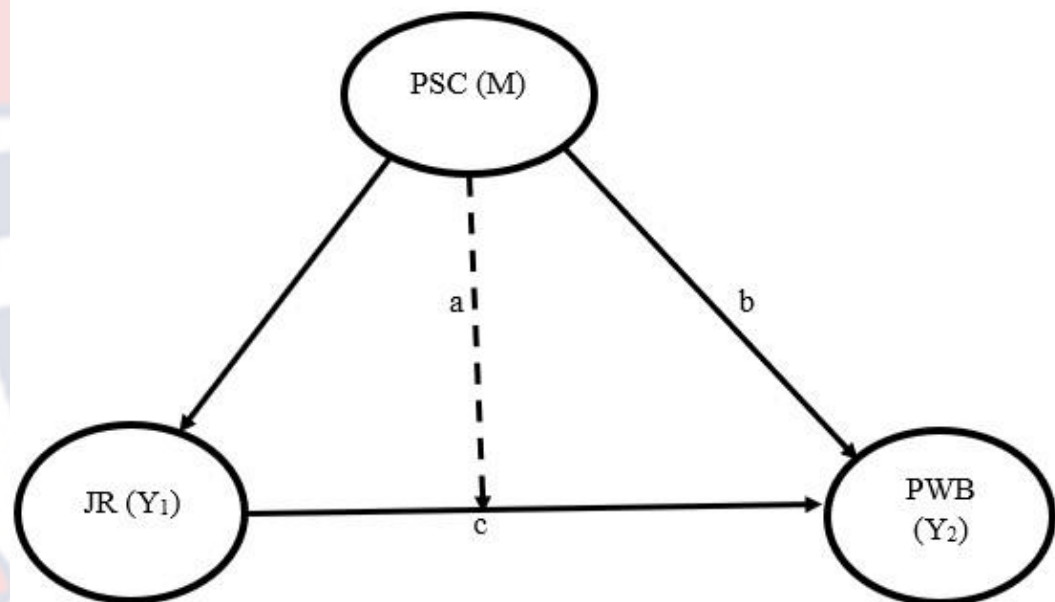


Figure 7: The moderating role of PSC on the effect of JR on PWB

The final phase of the analysis explored the moderating role of PSC on the effect of PWB on SI (Figure 8). The interaction term was created using the two-stage approach (Hair et al., 2021). In the first stage, the LVS for Y_1 , Y_2 and M was calculated, and multiplied at the second stage to create the interaction term. Also, the moderating model was evaluated, where the PSC was examined to make sure it meets all relevant psychometric criteria. Moreover, the interaction effect was then assessed for its significance. The moderating role of PSC on the influence of PWB

on SI will be supported if bootstrapping produces a significant interaction effect. Finally, the f^2 of the interaction effect was assessed to indicate the contribution the moderation makes towards explaining the SI among long-distance commercial bus drivers.

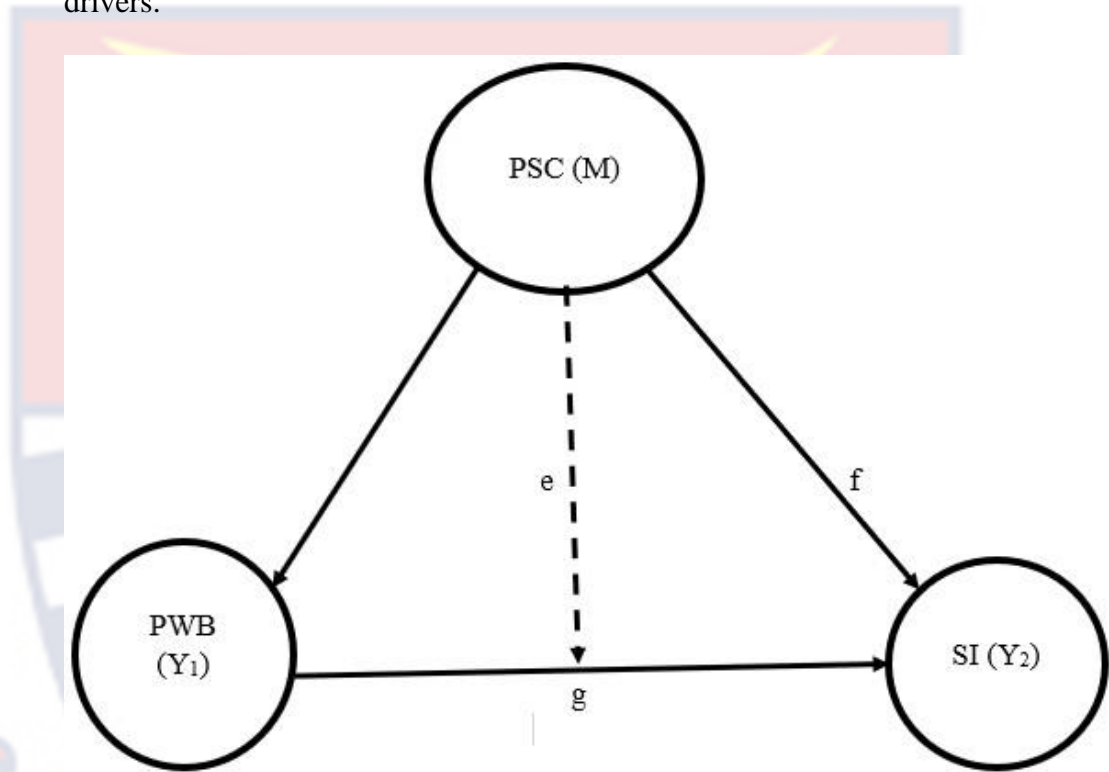


Figure 8: The moderating role of PSC on the effect of PWB on SI

CHAPTER FOUR

RESULTS AND DISCUSSION

This study aimed to: (1) explore the psychosocial hazards and the path through which psychosocial factors predict psychological well-being and safety incidents; (2) examine the effect of weekly hour intensity on safety incidents; (3) explore the effect of bus ownership on safety incidents; (4) assess the mediating role of psychological well-being and job resources on the effect of job demands on safety incidents; and (5) examine the moderating role of psychosocial safety climate on the influence of job demands and job resources on psychological well-being and safety incidents among long-distance commercial drivers in Ghana. Chapter four presents the results and discussions. The analyses were carried out according to the research questions.

Research Question 1: What is the Level of Psychosocial Hazards Confronting Long-Distance Commercial Drivers in Ghana?

This analysis assessed the level of psychosocial hazards among long-distance bus drivers in Ghana using frequency counts and percentage analysis. PSC was categorised according to the benchmarks by Sobel (1982), high (41 and above), moderate (37 to 40.99) and low (36.99 and below). Furthermore, weekly hour intensity equals daily working hours multiplied by weekly working days. Thus, time of 40 or less, 41-52, ≥ 53 hours per week represents low, moderate and high weekly hour intensity. Daily driving hour intensity was categorised into low (8 hours and below), moderate (9-11 hours) and high (12 hours and above). In addition, the mean scores of drivers' job insecurity, work-family conflict, job resources and job demands were used as the basis to categorise them into low- and

high-risk drivers. Using arithmetic means and frequency counts, detailed results are presented in Table 5.

Table 5: Levels of Psychosocial Hazards among Long-distance Commercial Drivers in Ghana (Sample =7,315)

Psychosocial hazards	Frequency & Percentage	Mean	Standard deviation	Level of risk
Shift work:				High
Yes	2954 (40.4%)			
No	4361 (59.6%)			
Lone driving:				High
Yes	4874 (66.6%)			
No	2441 (33.4%)			
Daily driving hours		9.48	3.62	High
≤ 8 hours	3509 (48%)			
9-11 hours	1818 (24.9%)			
≥ 12 hours	1988 (27.2%)			
Weekly driving hours		53.90	22.49	High
≤ 40 hours	2647 (36.2%)			
41-52 hours	1457 (19.9%)			
≥ 53 hours	3211 (43.9%)			
PSC		35.76	4.41	High
Low PSC	5539 (75.7%)			
Medium PSC	1221 (16.7%)			
High PSC	555 (7.6%)			
Job demands		17.51	3.29	High
Low JD	3993 (54.6%)			
High JD	3322 (45.4%)			
Job resources		15.52	1.35	High
Low JR	6316 (86.3%)			
High JR	999 (13.7%)			
Job insecurity		10.02	1.47	High
Low job security	3539 (48.4%)			
High job security	3776 (51.6%)			
Work-family conflict		16.84	3.54	High
Low conflict	2758 (37.7%)			
High conflict	4557 (62.3%)			

The study's results indicate that approximately 40% of long-distance bus drivers in Ghana are involved in shift work. This figure represents a notably high prevalence of shift work within this occupational group. In comparison, global data suggests that approximately 29% of professional drivers engage in shift work (Wright, Bogan & Wyatt, 2013). The elevated percentage observed in our study may be attributed to the informal and loosely structured nature of commercial road transport activities in Ghana, as noted in previous research (Atombo et al., 2017). Furthermore, it is worth noting that shift work is notably common among commercial drivers, and this occupation stands out as one in which shift work is particularly prevalent (Lee, Kim, Byun & Jang, 2017). These findings underscore the unique challenges faced by long-distance bus drivers in Ghana and the need for tailored interventions to address the implications of shift work on their well-being and safety.

Shift work schedules appear to have a deleterious impact on workers' physiology, health, and safety. For instance, shift work throws off the circadian rhythms of sleep and wakefulness, causing interrupted daytime sleep and excessive daytime sleepiness (Llamazares et al., 2021). Thus, the alteration of circadian rhythms and recovery periods or resting periods may boost the problematic transition between acute and chronic fatigue. Furthermore, a systematic review has reported that though symptoms related to chronic fatigue of shift drivers may be pharmacologically treated, driving tasks may be extremely impaired due to the side effects of the pharmacological products, hence, increasing the risk of road traffic crashes (Dassanayake, Michie, Carter & Jones, 2011). Moreover, drowsiness has a significant negative impact on driving owing to shift work since it slows down sustained attention and reaction times (Tàpia-Caballero et al., 2021). Also, it has

been reported that drivers who work on a shift basis have significantly higher rates of stress, burnout and exhaustion, leading to a high rate of road traffic accidents (Useche et al., 2019).

The results further revealed that about 67% of the long-distance drivers in the current study engage in lone driving. The high level of lone driving among long-distance bus drivers in Ghana is an indication that mental health and safe work values are not well integrated into the road transport sector in Ghana (Atombo et al., 2017). Perhaps, this signifies the exploitation of professional drivers by bus transport companies and individual bus owners which may make it difficult to have two drivers on long-distance trips (Boateng, 2021). Lone driving a long distance does not only affect the mental health of professional drivers but also poses a significant threat to the safety of passengers and other road users (Peters et al., 2021). For instance, recent evidence shows that a single driver on a trip is a risk factor for road traffic accidents regardless of the driver's years of driving experience (Vahedi, Shariat-Mohaymany, Tabibi, & Mehdizadeh, 2018). In addition, lone driving over long distances may result in fatigue driving which is a significant contributor to road traffic crashes and traffic-related injuries and mortality (Peng, Zhang, & Wang, 2020). Lone driving coupled with typical work features of professional drivers such as repetitive and monotonous work, high ergonomic demands, shift work, inflexible work schedules and passenger confrontation may increase job strain, burnout and risky driving behaviours (Useche et al., 2021), with the consequent road accidents, injuries and mortalities.

In Ghana, the road traffic regulations Act 2012 limits daily driving hours to eight (Ministry of Transport, 2022). However, the results from this study revealed that about 52% of long-distance bus drivers drive more than eight hours a day. This

is a clear violation of standards instituted by an act of constitution and regulations of the road transport industry. Furthermore, the results revealed that about 44% of these drivers drive for more than 52 hours per week. The high weekly driving hour intensity found in this study is also a sign of precarious working conditions for these drivers (Boateng, 2020). Thus, long driving hours reported by these drivers may be fueled by poor sector regulation, strict sales schedules or high sales demands, precarious employment contracts, drivers' lack of control or autonomy and poor enforcement of regulations in the road transport industry in Ghana (Boateng, 2021). Perhaps, this high driving hour intensity is the reason bus drivers account for the majority (36 percent) of road traffic crashes and related injuries and mortality in Ghana (Boateng, 2020), because such drivers can be dangerous on the road.

Strong evidence suggests that drivers with high driving hour intensity are more likely to be dangerous drivers (Wang & Pei 2014; Mehdizadeh, Shariat-Mohaymany, & Nordfjaern, 2018; Vahedi et al., 2018), leading to a significant amount of road traffic crashes (Wang & Pei 2014; Nguyen-Phuoc, Nguyen, De Gruyter, Su, & Nguyen, 2019). Thus, long driving hours do not just result in fatigue-related road traffic accidents but also expose drivers to serious health problems including ergonomic issues, mental distress and cardiovascular health conditions (Tàpia-Caballero et al., 2021; Useche et al., 2021). Hence, one of the ways of creating a safe work environment for long-distance bus drivers and protecting road users in Ghana is to enforce daily driving hours limits at eight hours and institute evidence-based weekly driving intensity. Perhaps, improving job resources such as job control or decision autonomy, job crafting, and social support from supervisors may help bus drivers to cope effectively with time pressures and/or long driving hours (Dollard et al., 2019) to reduce accidents and fatalities.

The results further revealed that about 76% of the drivers surveyed reported a low level of PSC in their work environment (mean score of 35.76), a situation that signifies a risky psychosocial work climate for these drivers. This high-risk PSC perception means that the bus drivers are exposed to a precarious work environment that risks their psychological and physical well-being and safety (Dollard et al., 2019), that in turn engages other road users. Perhaps, managers of bus transport companies and vehicle owners do not provide relevant and adequate supportive safety climate or strategies that promote a safe working climate for these drivers (Yulita et al., 2016). Another possible reason is that the bus drivers are not well-involved in the job design that defines the demands and resources available to them in their daily work schedules (Dollar et al., 2012). Furthermore, bus transport company managers, vehicle owners, driver unions, station masters and administrators may not have prioritised the safety and psychological well-being of these bus drivers, hence, creating precarious working conditions (Dollard et al., 2019). It is also possible that bus transport managers and bus owners have not paid considerable attention to issues that affect the psychological well-being and safety of long-distance bus drivers but rather focus on profits or productivity.

The macro-level factors such as job design, management, organisation of work, and social work environment that influence psychosocial hazards are within PSC (Hall et al., 2010). In other words, the low level of PSC among these long-distance bus drivers means that job designs, communication, management of work and the social context of their work may be seriously impaired. Also, PSC serves as a job resource that reduces the impact or risk associated with high workloads especially in an environment like driving where high job demands and low resources such as social support and autonomy are scarce (Dollard et al., 2012), as

experienced in this situation. Meanwhile, high perceived PSC among the drivers could have been a buffer to high job demands that promote psychological well-being (Loh et al., 2018) and directly reduce injuries and on-the-road accidents among this driver group (Platania, Morando, Caruso, & Scuderi, 2022). Therefore, increasing PSC creates a work environment that is usually safe for the bus drivers and helps reduce risks associated with high job demands, thereby improving the psychological well-being and safety on the road. Thus, in precarious and unsafe working conditions, increasing PSC may help to protect and promote long-distance bus drivers' health, well-being and safety, and provides them the opportunity to obtain resources to cope with conflicting and high job demands for safe driving.

The results further revealed that about 45% of the drivers perceived their job demands to be high in their daily work schedules. High job demands are antecedents to job stress and strain among professional drivers, especially in a work environment where job resources such as job control, supervisor and colleague support are limited (Useche et al., 2019; Peters et al., 2021), as may be the case for these drivers. It is also worth noting that job stress as a result of high job demands is frequently associated with accidents or injuries at work (Dollard et al., 2019; Useche et al., 2021). Moreover, job stress due to high job demands is a determinant of impaired occupational health outcomes such as psychological distress, cardiovascular and ergonomic issues, overweight and obesity, and fatigue among professional drivers (Useche et al., 2019). The high job demands might emanate from shift work and long driving hours reported by participants in this survey. Thus, the physical and psychological health of these drivers may be seriously impaired, thereby increasing their likelihood of being involved in accidents.

Meanwhile, about 86% of the drivers perceived low job resources, from their supervisors and colleagues at work. Low job resource is a risk factor for occupational accidents and injuries among professional drivers because these resources help the drivers to cope effectively with daily job demands (Tàpia-Caballero et al., 2021). The perceived low job resources may also reaffirm the notion that managers of bus transport companies, vehicle owners and station masters do not prioritise the well-being and safety of their drivers; therefore, limited resources are made available to these drivers. Perhaps, the poor integration of occupational health and safety standards into the road transport industry in Ghana and the limited value for worker health and safety account for the low job resources and high job demands among these long-distance bus drivers. Unfortunately, such workplace conditions are grounds for increased risky driving which results in accidents, injuries and fatalities. Bus drivers with low level of job resources may not have the necessary social support and other job resources to cope effectively with time pressures and workload. This may impair driving performance and consequently expose passengers and other road users to the dangers of road traffic accidents and related injuries and fatality.

Job demands and resources interact to affect well-being and performance outcomes at the workplace (Demerouti et al., 2001). In a situation where there are high job demands and low job resources, just like in the case of these bus drivers, perceived psychological well-being and safety become extremely impaired. However, the devastating interaction effect of high job demands and low job resources in the work environment of these drivers can be reduced with a high level of PSC where communication, feedback and access to essential resources to cope with job demands are prioritised in the industry (Dollard et al., 2012). This means

that, with the low level of PSC, as recorded in this study, the bus drivers may be at higher risk and become extremely vulnerable to poor occupational health and safety outcomes including impaired psychological well-being and poor driving performance, conditions that make Ghana's roads extremely dangerous to travel on.

Job insecurity can be psychologically draining on the worker. Findings from this current study indicated that about 48% of these drivers have a perception that they could lose their job in a short time. This is a higher level of job insecurity among these drivers compared to what Useche et al. (2018) reported (15%) among bus and taxi drivers in Colombia recently. In countries with higher unemployment rates and poor labour regulations and enforcement like Ghana, professional drivers may be put in a stressful situation because of uncertainties about their jobs' safety and stability (Boateng, 2021). Moreover, as drivers experience job insecurity, they may be more likely to drive long hours, recklessly to meet high daily or weekly sales demands and to maintain their job with a less concentrated mind. Additionally, job insecurity produces enough job stress that impairs drivers perceived psychological well-being and safety, leading to increased road safety challenges (Boateng, 2021). Unfortunately, evidence shows that bus and taxi drivers who reported high levels of job insecurity were more likely to report road traffic incidents (Useche et al., 2018), which are common on Ghana's roads (Boateng, 2021). Ghana's road may not be safe because of job uncertainty of the drivers plying the roads.

The results further indicate that about 62% of the long-distance bus drivers perceived that their work is interfering with their family life. This may be due to extensive, irregular, or inflexible work hours, shift work, work overload and other

forms of job stress. Work-family stress is among the work stressors of professional drivers that may take a toll on their psychological well-being and driving performance. A recent study reported that professional drivers that experience work-family conflict are more likely to experience road traffic crashes and related injuries (Shukri, Jones & Conner, 2021). Such conflict may compound the already precarious psychosocial hazards among the drivers in Ghana. High levels of psychosocial hazards among bus drivers such as lone driving, shift work, long driving hours, low PSC and job resources and high job demand, job insecurity and work-family conflict may interfere with the global agenda of promoting safe and decent work for all workers. These high levels of psychosocial work factors are detrimental to the health, well-being and safety of these drivers and other road users. Therefore, the majority of long-distance bus drivers who commute from Accra to other parts of Ghana and the sub-region are working in precarious conditions. There seems no further argument for the high rate of road crashes on Ghana's roads, making them the deadliest in Africa (Boateng, 2021).

Research Question 2: What is the Difference in Safety Incidents According to Weekly Hours of Driving Intensity among Long-Distance Commercial Drivers in Ghana?

The Kruskal-Wallis test was calculated to determine the differences in the safety incidents (risky driving behaviours) according to categories of weekly driving hour intensity. A Kruskal-Wallis test showed a statistically significant difference in safety incident scores for the different weekly driving hour intensity groups, $\chi^2(2, 7315) = 768.68, P = .000, \eta^2_p = .105$, with a mean rank safety incident score of 2853.43 for 40 hours or less, 3855.63 for 41-52 hours and 4231.58 for 53 hours or more hours of weekly driving. However, with an eta squared of .105, the

magnitude of the practical difference in the safety incident score was small (Cohen, 1988). Bonferroni-adjustment alpha level of .017 was used to compare all pairs of groups of weekly driving hour intensity, which were statistically significant (all p values $<.017$). Thus, long-distance bus drivers with weekly driving hour intensity of ≥ 53 hours significantly had a higher safety incident score than drivers with weekly driving hour intensity of ≤ 41 hours and between 41 and 52 hours. Also, drivers with weekly driving hour intensity of 41-52 significantly had a higher safety incident score than drivers with a weekly driving hour intensity of ≤ 41 (see Table 6). Therefore, the longer these drivers stay on the road driving within a week, the more they are likely to get involved in risky driving behaviours that could lead to road crashes.

Table 6: Kruskal-Wallis H Test Results for Safety Incidents by Categories of Weekly Driving Hour Intensity

Groups	n	Mean Rank	df	χ^2	Sig	η^2_p
40 hours or less	2647	2853.43				
41-52 hours	1457	3855.63	2	768.68	.000	.105
53 hours or more	3211	4231.58				

The finding revealed that the longer the hours the long-distance commercial driver in Ghana drives per week, the more they are likely to be involved in risky driving behaviours leading to road traffic crashes. This is because driving several hours per week may impair the driving ability of the driver. For instance, driving less than 40 hours a week is regarded as healthy for long-distance drivers in Ghana (Ministry of Transport, 2022). In other words, driving 40 hours a week translates into eight hours of driving for five out of seven days. It means that drivers who

drive 40 hours a week are likely to have better rest and recovery periods which are likely to improve their driving performance and reduce the rate of occurrence of safety incidents on the road (Alonso et al., 2020). Also, driving 40 hours or less in a week may help reduce fatigue driving, ill ergonomic conditions, sedentary lifestyle and cardiovascular health issues associated with long driving hours. Furthermore, long-distance drivers who drive 40 or fewer hours weekly are likely to have time for their social life and, most importantly, balance family and work life to improve their well-being that may translate into concentration during driving (Shukri et al., 2021). Therefore, driving 40 or fewer hours per week needs a favourable environment where job resources are available and job demands are low or moderate, to match with the available resources, to enhance driving performance, and reduce road crashes and their related health and economic costs.

Long-distance drivers that drove more than 40 hours per week may be experiencing driving fatigue with associated high rates of safety incidents due to additional precarious working conditions such as long shift hours and lone driving (Alonso et al., 2020). Moreover, long-distance drivers who drive long hours are likely to have fewer rest and recovery periods, which interfere with their well-being and driving performance and create safety challenges for everyone on the road (Alonso et al., 2016). For instance, evidence shows that drivers who drive for long hours may be experiencing other psychosocial work factors such as job insecurity, work-family conflict, low job resources, effort-reward imbalance and low PSC (Cendales et al., 2017; Platania et al., 2022). Meanwhile, there is a possibility that bus drivers who drive more than 40 hours per week are likely not to participate in safety measures and take precautions that safeguard their health and safety.

Perhaps, the evidences are the high rates of road crashes experienced on Ghana's roads daily (Boateng, 2020).

Drivers who drive more than 53 hours a week recorded higher safety incidents than those who drive between 41 and 52 hours per week. This may be due to accumulated fatigue and burnout which make such drivers more likely to sleep while driving (Alonso et al., 2016; Peng et al., 2020). This may translate into driving for at least seven hours per day for seven days or eleven hours a day for five days per week. Unfortunately, evidence indicates that daily driving of 11 hours (Berrones-Sanz, 2018), 14 hours (Wu et al., 2019) and 16 hours (Santos & Lu, 2016) are risk factors for road traffic crashes and injuries among professional drivers. Furthermore, it is observed that an additional one-unit increase in weekly driving hours significantly increased bus drivers' crash involvement risk over three times (Besharati & Tavakoli-Kashani, 2018). Thus, as weekly driving hours increase, bus drivers' chance of experiencing safety incidents increases significantly. This is again supported by evidence from a systematic review of the road transport industry that driving periods >8 hours daily carry an increased risk of safety incidents and that, at 12 hours, the risk is twice that of eight hours (Wagstaff & Lie, 2011).

The evidence further shows that when road safety incident increases, road traffic crashes, injuries and mortality become enormous, affecting societies and individuals (Blankson & Lartey, 2020). Perhaps, high safety incidents reported may be the reason for which an average of eight people die daily in Ghana due to road traffic crashes (Blankson & Lartey, 2020). In addition, these researchers reported that in Ghana each household spends an average of 1,688 US dollars yearly due to direct and indirect costs associated with high safety incidents on the road.

Furthermore, aside from the human and economic suffering caused by road traffic incidents, there is also a heavy burden on emergency care and the overall healthcare system (WHO, 2021a). Thus, in Ghana where the healthcare system is already weak (WHO, 2018), high safety incidents on our roads complicate the over-burdened healthcare system. Also, increases in road safety incidents may affect emergency healthcare access due to patient overload, limited services and poor integration of emergency services with other healthcare services in the country (WHO, 2021a).

Research Question 3: What is the Difference in Weekly Driving Hour Intensity According to Bus Ownership among Long-distance Commercial Drivers in Ghana?

The purpose of this analysis was to find out if weekly driving hour intensity may differ according to bus ownership of long-distance bus drivers. To answer this, the Kruskal-Wallis test was conducted. The results showed a statistically significant difference in weekly driving hours for different bus ownerships, $\chi^2(2, 7315) = 46.44, P = .000, \eta^2_p = .006$; specifically, with a mean rank weekly driving hours of 3429.91 for private operators, 3525.69 for public companies and 3794.48 for individual ownership. However, with an eta squared of .006, the magnitude of the practical difference in the weekly driving hours intensity was small (Cohen, 1988).

Table 7: Kruskal-Wallis H Test Results for Weekly Driving Hour by Categories of Bus Ownership

Groups	<i>n</i>	Mean Rank	<i>df</i>	χ^2	<i>Sig</i>	η^2_p
Private company	2128	3429.91				
Public company	828	3525.69				
Individual	4359	3794.48	2	46.44	.000	.006

Using a Bonferroni-adjustment alpha level of .017, the pairwise comparison revealed that private and public company bus ownership did not differ significantly in weekly driving hour intensity (p -value $>.017$), but drivers employed by individual bus owners had significantly higher weekly driving hour intensity than those engaged by private and public company bus ownerships. Thus, long-distance bus drivers employed by individual bus owners drive longer hours per week compared to drivers from private and public companies.

The findings imply that drivers who drive buses owned by individuals work longer hours than their counterparts from public and private transport companies. Perhaps, compared to other drivers, drivers employed by individual bus owners are likely to be paid based on performance or daily sales targets (Boateng, 2020). Thus, drivers working for individual transport businesses are likely to drive more hours per day and more days a week just to meet daily sales targets and maintain their jobs. These drivers are also likely to drive alone, without support from co-drivers for long hours thereby increasing their driving hour intensity; engaging two drivers per a trip will increase the cost of operation of such owners (Boateng, 2021).

Individuals who own transport businesses may not also integrate safety standards and occupational health and safety measures into their operations (Atombo et al., 2017), due to the burden of the associated additional cost. Perhaps, the poor enforcement of safety standards in road transport operations in Ghana motivates individual bus owners to ignore safety measures including driving hour limits (Atombo et al., 2017). Furthermore, job insecurity in the road transport sector is forcing drivers of individual-owned buses to drive long hours and days to maintain their job and make enough sales, to the detriment of safety, human health and well-being. These drivers are also more prone or vulnerable to road traffic

accidents, injuries and mortality (Useche et al., 2021). Moreover, they may be exposed to various occupational diseases such as musculoskeletal issues, cardiovascular diseases, and mental distress like depression and anxiety (Peters et al., 2021; Tàpia-Caballero et al., 2021; Useche et al., 2021). Hence, much attention must be paid to individual-owned bus transport businesses to help integrate safe work and industrial best practices in their operations because they also employ the majority of drivers in the sector. This may help promote and protect the health, well-being and safety of long-distance bus drivers and other road users.

Research Question 4: What is the Extent to which Job Demands, Job Resources and PSC Predict Psychological Well-being and Safety Incidents of Long-distance Commercial Drivers in Ghana?

The extent to which psychosocial factors (JD, JR and PSC) predict well-being (PWB) and safety incidents (SI) among long-distance bus drivers, who commute from Accra and Tema to other parts of Ghana, was analysed using the PLS-SEM (via Smart PLS Software version 3.9.9). This is a reflective model (arrows move from the latent variables toward the indicators). The overall fit of the model was first examined using the standardised root mean square residual (SRMR).

Reliability was examined using composite reliability (composite reliability $\geq .70$ is acceptable) whereas convergent validity was assessed using AVE values (AVE values $\geq .50$ are acceptable). Furthermore, the discriminant validity was assessed using the Fornell and Larcker (1981) criterion and HTMT (HTMT values < 1). In addition, the R^2_{adj} , Q^2 and path coefficients were assessed (Hair et al., 2020). However, the initial analysis revealed that one item (PWB_4) had an indicator outer loading $< .07$ and hence, it was removed from further analysis. The results indicate

that the path model achieved a good-fit; SRMR = .08 (Criterion \leq .10) and ended at iteration seven - maximum is 300 (Hair et al., 2021). Construct indicator outer loadings were between 0.82 and 0.94 on JD, 0.83 and 0.96 on JR, 0.76 and 0.89 on PSC, 0.92 and 0.96 on PWB, and 0.87 and 0.94 on SI. Also, the composite reliability of 0.96 on JD, 0.95 on JR, 0.96 on PSC, 0.96 on PWB, and 0.95 on SI were all acceptable (see Table 8). With AVE values between 0.68 and 0.88, the convergent validity of the constructs was established, at a cut-off-point of \geq 0.50 (Hair et al., 2014). See details of AVE in Table 8.

Also, using the Fornell and Larcker (1981) criterion, the discriminant validity of the latent constructs was established (see Table 9). Thus, each latent construct was different and the phenomena they measured were also different. Furthermore, it is recommended to use the HTMT ratio of correlation to further evaluate the discriminant validity of the constructs since they were reflectively modelled (Hair et al., 2021). Once again, discriminant validity is established (see Table 10).

Furthermore, Fornell and Larcker's (1981) criterion was used to assess multicollinearity since the constructs were reflectively modelled (Hair et al., 2014). The results in Table 9 shows that issues of multicollinearity do not exist in the path model. Again, VIF was used to assess model collinearity, which further indicated that issues of multicollinearity do not exist in the path model. Thus, VIF values between 1.000 and 3.037 (see Table 11), of the predictors are acceptable [VIF $>$ 0.10 and $<$ 5]. Hence, all the predictors were included in the path model (Hair et al., 2021).

Table 8: Item Listings, CR, AVE, and Outer Loadings for Five Constructs: JD, JR, PSC, PWB and SI

Latent Constructs	Outer loadings				
	JD	JR	PSC	PWB	SI
JD (CR=.96; AVE=.80)					
JD_1	0.89				
JD_2	0.91				
JD_3	0.94				
JD_4	0.86				
JD_5	0.92				
JD_6	0.90				
JD_7	0.82				
JR (CR=.95; AVE=.80)					
JR_1		0.83			
JR_2		0.93			
JR_3		0.96			
JR_4		0.83			
JR_5		0.92			
PSC (CR=.96; AVE=.68)					
PSC_1			0.81		
PSC_2			0.84		
PSC_3			0.79		
PSC_4			0.78		
PSC_5			0.85		
PSC_6			0.89		
PSC_7			0.76		
PSC_8			0.86		
PSC_9			0.86		
PSC_10			0.77		
PSC_11			0.86		
PSC_12			0.78		
PWB (CR=.96; AVE=.88)					
PWB_1				0.96	
PWB_2				0.92	
PWB_3				0.95	
PWB_5				0.92	
SI (CR=.95; AVE=.82)					
SI_1					0.87
SI_2					0.94
SI_3					0.91
SI_4					0.92
SI_5					0.91

Table 9: Fornell and Larcker (1981) Criterion for Discriminant Validity of the Path Model

Latent Construct	JD	JR	PSC	PWB	SI
JD	0.891				
JR	0.119	0.893			
PSC	-0.012	-0.811	0.822		
PWB	-0.051	0.041	-0.029	0.938	
SI	0.721	0.04	-0.001	-0.166	0.908

Table 10: Heterotrait-monotrait Ratio of Correlations of the Path Model

Latent Construct	JD	JR	PSC	PWB	SI
JD					
JR	0.146				
PSC	0.139	0.854			
PWB	0.065	0.076	0.088		
SI	0.751	0.065	0.112	0.16	

Table 11: Collinearity Statistics (VIF) of the Path Model

Latent Construct	JD	JR	PSC	PWB	SI
JD				1.037	1.040
JR				3.032	3.037
PSC	1.000	1.000		2.989	2.99
PWB					1.005
SI					

The results further revealed that JD, JR, PSC and PWB combined to explain 54% of the variance in SI ($R^2_{adj}=0.540$), PSC explained 65.8% ($R^2_{adj}=0.658$) of the variance in JR and JD respectively. In addition, JD, JR and PSC combined to explain 0.4% of the variance in PWB ($R^2_{adj}=0.004$). Furthermore, the evaluation of the constructs' predictive relevance (Q^2) revealed that the endogenous construct, PWB (.002) and SI (0.443) had values greater than zero (Hair et al., 2021).

The path coefficients revealed that PSC had the strongest but negative effect on JR ($r = -0.811$), followed by JD with a strong positive effect on SI ($r = -0.727$). Also, both PWB ($r = -0.126$) and JR ($r = -0.115$) had a small negative effect on SI. The rest of the path coefficients were less than ± 0.1 (see Figure 9). The bootstrapping results showed that all the paths were significant except that of PSC→JD and PSC →PWB (see Figure 10). It should be noted that a path's strength depends on its values, which is significant if the critical value (t-value) is higher than 1.96 at 0.05 (See Figure 11).

The f^2 of the paths were estimated using the bootstrapping approach, with values of .02, .15 and .35 denoting small, moderate, and high respectively (Cohen, 1988). The results revealed that the paths JD → SI and PSC → JR had a high effect size ($f^2 > 0.35$). Thus, JD and PSC made a large practical significant contribution in predicting SI and JR among long-distance bus drivers, respectively. The effect sizes of the remaining paths are significant though small, except that of JR → PWB with $f^2 = 0.002$ and p -value > 0.05 (see Table 12). Thus, JR did not make any practical significant contribution to predicting the PWB among the drivers.

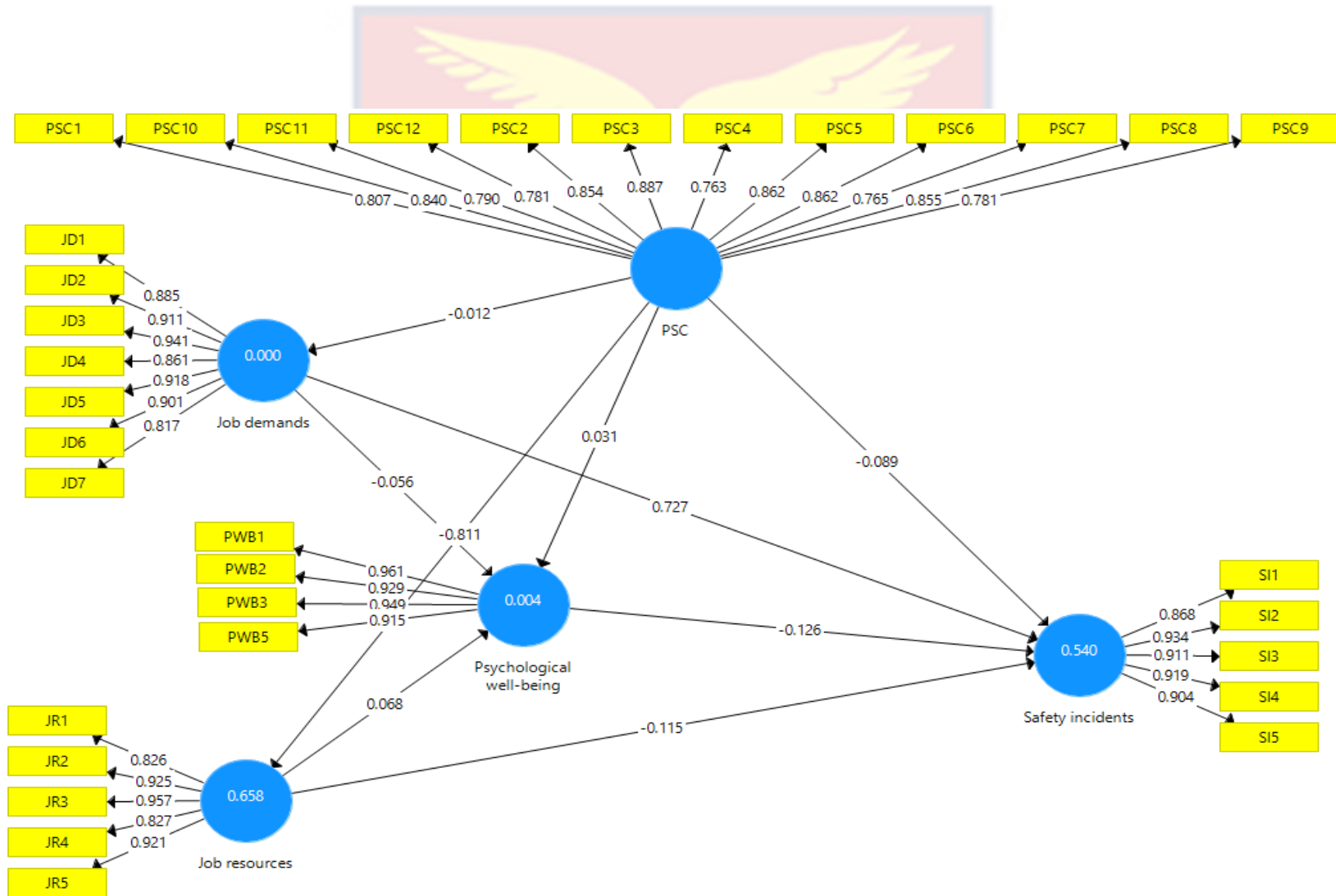


Figure 9: PLS-SEM reflective model predicting PWB and SI from JD, JR and PSC

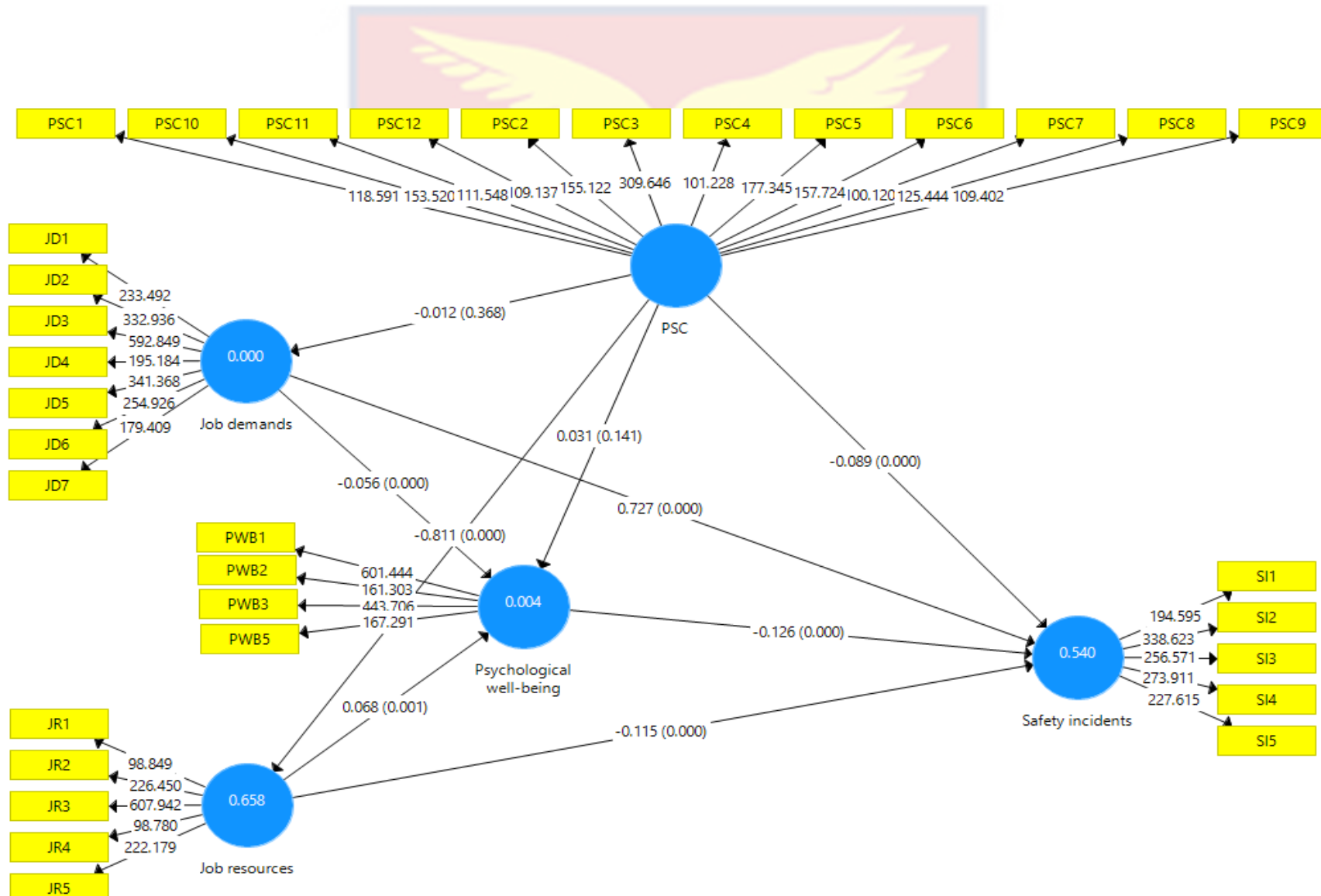


Figure 10: Summary results of the bootstrapping procedure showing significance of the path coefficients

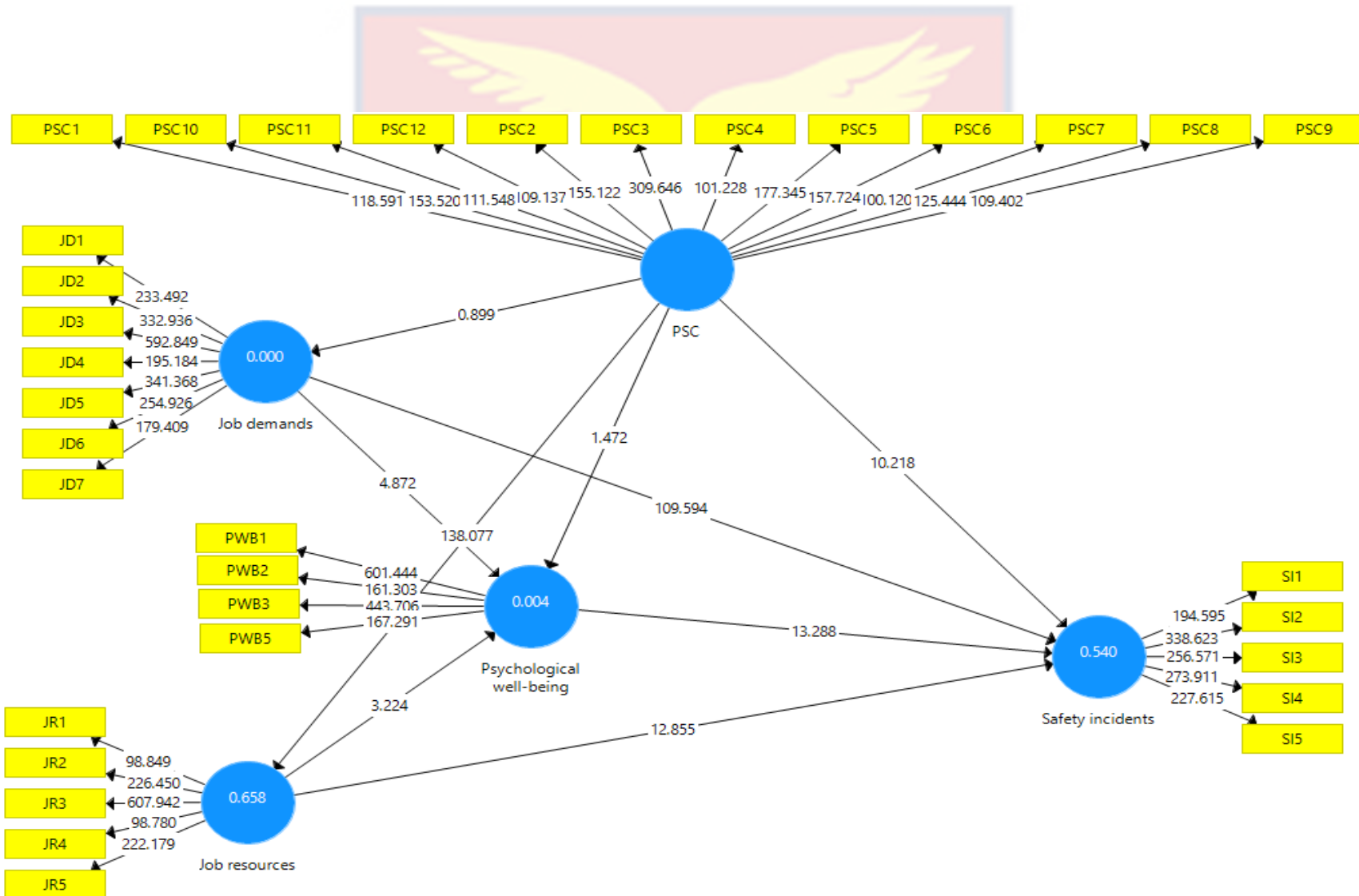


Figure 11: Summary results of the bootstrapping procedure predicting PWB and SI from JD, JR and PSC

Table 12: Effect sizes (Cohen f^2) of the Path Coefficients

Path	f^2	SD	T Statistics	P-values
JD -> PWB	0.003	0.001	2.409	0.016
JD -> SI	1.106	0.043	25.543	0.000
JR -> PWB	0.002	0.001	1.606	0.108
JR -> SI	0.009	0.001	6.909	0.000
PSC-> JR	1.925	0.082	23.503	0.000
PSC-> SI	0.006	0.001	5.372	0.000
PWB -> SI	0.035	0.005	6.558	0.000

SD = Standard deviation

The results mean that JD has a direct significant negative effect on PWB and SI, and JR has a direct significant negative effect on SI of long-distance bus drivers. Moreover, JR had a positive but non-significant effect on the PWB of the bus drivers. Furthermore, PSC has a direct significant negative effect on JR and SI, while PWB of the drivers has a direct significant negative effect on their SI. It is essential to understand that these psychosocial work factors, JD, JR and PSC exist together to some extent in the workplace of professional bus drivers. However, the extent to which these factors exist and the impact they have on each other is of concern to occupational health and safety practitioners, researchers, employers, workers and other stakeholders.

The strong and significant negative relationship with JR (social support) may be that the low PSC environment of these bus drivers inhibited or prevented the uptake of social support for their daily work schedules. Thus, this study found that as PSC increased, JR (social support) for long-distance bus drivers decreased significantly. This is in sharp contrast to the argument and evidence that increasing

PSC in the work environment helps improve JR available to the workers (Dollard et al., 2019; Teoh & Kee, 2020). Thus, if increasing organisational PSC leads to decreased social support among long-distance bus drivers, then, it means that increasing PSC may not automatically lead to increased social support unless efforts are made to encourage and train these bus drivers to utilise social support for their benefits (Dollard et al., 2012; Yulita et al., 2016); or PSC is very low to the extent that it could lead to increased JR for the benefit of drivers. It also raises another argument that while PSC is more of an organisational factor, JR including social support is more of an individual factor.

The negative relationship between PSC and JD (physical and psychological demands) confirms the PSC theory that increasing PSC at the workplace may lead to reduced JD (Dollard et al., 2019). The plausible explanation for the weak and non-significant association between PSC and JD is that the low level of perceived PSC among the drivers could not make any significant contribution to decreasing the debilitating effects of JD on the drivers. Therefore, it is not surprising that the negative relationship found between PSC and the JD of the bus drivers was not significant. A similar finding has been reported by Biron, Parent-Lamarche, Ivers and Baril-Gingras (2018) that PSC had a weak and a non-significant negative association with JD of managers in four organisations in Quebec, Canada. It implies that a high PSC is needed to reduce the effects of JD on long-distance bus drivers (Mansour, 2022). This finding further implies that PSC is not informing the job designs of the bus drivers, perhaps, due to the low level of PSC in their work environment. This situation is likely to increase the job stress of bus drivers and expose them to impaired safety and well-being issues (Loh et al., 2018).

The positive association between PSC and PWB is a confirmation that an improved organisational PSC may enhance the PWB of the workers (Dollard et al., 2019). Perhaps, the low level of PSC in the work environment of the bus drivers did not make any significant contribution to improving the PWB of the drivers which resulted in a weak and non-significant effect of PSC on PWB. In a similar study, Dollard and Bakker (2010) reported that the PSC of a school environment did not have a significant association with the PWB of the educators. Also, recent evidence shows that among health workers, PSC did not show a significant effect on psychological well-being (Platania et al., 2022). The implications are that the car owners, station masters and managers of bus transport companies have not made a significant effort to improve the PWB of their drivers despite the high levels of job demands and low job resources in the sector. This situation may further expose the drivers to physical and mental health issues since their PWB is not prioritised by management and bus owners (Biron et al., 2018). Unfortunately, drivers with impaired PWB pose a risk for road traffic crashes, which makes it difficult or impossible to protect the safety of other road users.

The significant negative association between PSC and SI of the drivers implies that increasing the level of PSC in the transport industry may significantly reduce safety incidents on the road. Perhaps, increasing PSC in the work environment of the drivers may improve the PWB of the drivers and, hence, improve their driving performance (reduce safety incidents). Similar studies have found that PSC had a significant negative association with occurrence of workplace injuries (Bailey et al., 2015; Zadow et al., 2017). This current study shows that even at a low level of reported PSC, it had a significant capacity to reduce the occurrence of safety incidents among the drivers. Moreover, improving job design, PWB and

safety incidents of professional bus drivers rely on the extent to which they perceive PSC. In that case, the provision of both physical and psychological support for the drivers, involving drivers in designing their daily work schedules and prioritising their well-being and safety are all dependent on the level of PSC that exist in their work environment (Dollard et al., 2010). However, PSC is a policy-driven occupational concept within which other interventions, procedures and practices are developed to create safe work, and promote and protect the safety and the PWB of the drivers (Yulita et al., 2020). Then, considerable efforts towards improving the PSC of the work environment of the bus drivers may not just help promote and protect the PWB of the bus drivers but it might also help to protect the safety of road users.

In this study, JD had a strong and significant positive association with SI. Moreover, JD had an indirect significant effect on SI through PWB. Thus, JD had a weak though significant negative association with PWB which in turn produced a small and significant negative association with SI. The indirect association between JD and SI through PWB confirms the health erosion hypothesis, and that JD affects SI through impaired PWB (Dollard et al., 2019; Demerouti et al., 2001). The direct association between JD and SI and the indirect association between JD and SI through PWB have been reported in similar studies using professional drivers (Cendales-Ayala et al., 2017; Li et al., 2017). The findings imply that drivers exposed to high physical and psychological demands are more likely to engage in risky driving and report high levels of injuries, road crashes and fatalities. Thus, high JD impairs driving performance significantly, especially in a resource-poor work environment where drivers have limited access to resources to cope effectively with increasing work demands (Useche et al., 2021). The finding also implies that

drivers are experiencing high physical and psychological job demands which are having a great toll on their driving performance, putting themselves and other road users at risk of road crashes.

The findings further revealed that JR had both direct and indirect (via PWB) significant negative effects on SI. This finding again confirms the JD-R and PSC theories and the health erosion hypothesis which holds that increasing JR improves on-the-job safety performance either directly or by first improving PWB, hence, reducing accidents and related issues on the road (Dollard et al., 2019; Demerouti et al., 2001). These findings have also been confirmed in previous studies (Bakker & Demerouti, 2017; D-Marko et al., 2018; Guo et al., 2019; Kantan et al., 2019; Lopez-Martin & Topa, 2019; Skaalvik & Skaalvik, 2018).

The further finding indicated that though JR had a significant positive association with PWB, it did not make a practical significant contribution to explaining the PWB of the bus drivers. Perhaps, the low level of PSC and social support provide no buffer to the effect of high JD on the PWB of the drivers. Thus, it is important to increase organisational level PSC and JR, since that will reduce the negative and strong effect of JD on the PWB of the drivers (Dollard et al., 2019). Also, due to the limited JR available to these drivers, PWB may be impaired, leading to increased SI on our roads and attendant health, safety, economic and social implications. Hence, station masters, car owners and managers of road transport companies need to make efforts and commit resources to improving the JR of bus drivers to create a safe working environment and improve the PWB and safety performance of the drivers and, as well, protect the safety of other road users. Moreover, improving PSC and JR in the bus transport industry through modern OHS interventions and best practices may help Ghana to achieve SDG goal 8 target

8 which aims at eliminating all precarious forms of employment and ensuring a decent and healthy work environment for all. Perhaps, the development of modern OHS policies and intervention, and the adoption of best practices in the bus transport industry may help integrate best OHS practices in the informal operation of bus transport activities in Ghana to protect drivers and road users.

The theoretical implications of the findings are multifaceted and contribute significantly to our understanding of psychosocial work factors and their effects on long-distance bus drivers, particularly within the context of Ghana's transportation industry. The study reaffirms the applicability of established theoretical frameworks such as the JD-R model and the PSC theory in the unique occupational setting of long-distance bus drivers. It underscores the critical role of these theoretical foundations in explaining the relationships between psychosocial work factors, PWB, and SI. Moreover, the results validate the health erosion hypothesis, which posits that high JD negatively impact PWB and, in turn, lead to increased SI. The study's findings also align with the notion that increasing JR, including social support, improves safety performance and PWB, reinforcing the JD-R model. These theoretical implications emphasise the need for a holistic approach to addressing the well-being and safety of long-distance bus drivers, rooted in the application of established theories within the domain of occupational health and safety.

Research Question 5: What is the Extent to which Psychological Well-being Mediates the Effect of Job Demand and Job Resources on Safety Incidents among Long-distance Commercial Drivers in Ghana?

To determine the mediating role of PWB on the influence of JD and JR on SI, SEM-PLS was computed using Smart PLS version 3.9.9. This version allows a complete model to be run once without separating the analysis into a partial (without the mediator) and a complete model (with the mediator). Using the SRMR, the path

model achieved a good-fit, 0.066 (Criterion ≤ 0.10) and ended at iteration seven, maximum of 300 (Hair et al., 2021). Furthermore, the outer loadings and composite reliability of the constructs were generally acceptable, at 0.70 minimum (Hair et al., 2014). However, the outer loadings of two items (PWB_4 and JR_4) were < 0.70 ; therefore, they were removed from further analysis. The results from the PLS showed outer loadings between 0.82 and 0.94 on JD, 0.80 and 0.96 on JR, 0.91 and 0.96 on PWB and 0.87 and 0.94 on SI. In addition, CR of 0.96, 0.94, 0.96 and 0.95 for JD, JR, PWB and SI respectively were achieved (Hair et al., 2014). Hence, the reliability of the latent constructs was established (see Table 13). The results further showed that AVE of 0.80, 0.81, 0.88 and 0.82 for JD, JR, PWB and SI were all acceptable; hence acceptable convergent validity of the latent constructs was established.

Using the Fornell and Larcker's (1981) criterion, the results indicated that the square root of the AVE in each latent construct (diagonal values) is higher than the correlation coefficient for other constructs; hence, the discriminant validity was established (see Table 14). The establishment of discriminant validity means that each latent construct is different and measures different phenomena. Further, analysis using the HTMT criterion also established discriminant validity for the latent constructs in the mediation model since all the values are less than one (Hair et al. (2021). The figures are presented in Table 15.

Table 13: Item Listings, CR, AVE and Outer Loadings for Four Constructs: JD, JR, PWB and SI

Latent Constructs	Outer loadings			
	JD	JR	PWB	SI
JD (CR=.96; AVE=.80)				
JD_1	0.89			
JD_2	0.91			
JD_3	0.94			
JD_4	0.86			
JD_5	0.92			
JD_6	0.90			
JD_7	0.82			
JR (CR=.94; AVE=.81)				
JR_1		0.93		
JR_2		0.96		
JR_3		0.90		
JR_5		0.80		
PWB (CR=.96; AVE=.88)				
PWB_1			0.96	
PWB_2			0.93	
PWB_3			0.95	
PWB_5			0.91	
SI (CR=.95; AVE=.82)				
SI_1				0.87
SI_2				0.94
SI_4				0.91
SI_5				0.92
SI_6				0.91

Table 14: Fornell and Larcker (1981) Criterion for Discriminant Validity

Latent construct	JD	JR	PWB	SI
JD	0.891			
JR	0.168	0.901		
PWB	-0.047	0.039	0.939	
SI	0.721	0.08	-0.164	0.908

Table 15: Heterotrait-monotrait Ratio of Correlations of the Mediation Model

Latent construct	JD	JR	PWB	SI
JD				
JR	0.147			
PWB	0.065	0.074		
SI	0.751	0.07	0.16	

Fornell and Larcker's (1981) criterion was also used to assess multicollinearity since the constructs are reflectively modelled (Hair et al., 2014). The VIF values between 1.005 and 1.032 (see table 16) indicated that all the predictors were eligible to be included in the mediation model [VIF >0.10 and < 5] (Hair et al., 2021).

Table 16: Collinearity Statistics (VIF) for the Mediation Model

Latent Construct	JD	JR	PWB	SI
JD			1.029	1.032
JR			1.029	1.031
PWB				1.005
SI				

The results revealed that in combination, the predictors (JD, JR and PWB) have the moderate predictive ability [$R^2_{adj} > .50$] (Hair et al., 2014) since they contributed 53.7% of the variance in SI among the drivers [$R^2_{adj} = 0.537$] (see Figure 12). In addition, Q^2 was assessed using the blindfolding method, which indicated that the endogenous constructs (SI and PWB) had Q^2 values (SI=0.44 and PWB = 0.002) greater than zero (Hair et al., 2014).

Table 17: Mediation Effect of PWB on the Effect of JD and JR on SI

Paths	Path Coefficient	SD	t-value	p-value
Direct Effect (without the mediator)				
JD→SI	0.728	0.007	103.817	0.000
JR→SI	-0.043	0.005	9.451	0.000
Direct Effect (with the mediator)				
JD→SI	0.721	0.007	103.337	0.000
JD→PWB	-0.057	0.012	4.880	0.000
JR→PWB	0.050	0.013	3.879	0.000
JR→SI	-0.037	0.005	7.373	0.000
PWB→SI	-0.128	0.009	13.598	0.000
Specific Indirect Effect				
JD→PWB→SI	0.007	0.001	5.230	0.000
JR→PWB→SI	-0.006	0.002	3.790	0.000

SD = Standard Deviation

The path coefficient revealed that all the paths in the mediating model were significant ($p < 0.5$), with the strongest as JD→SI, followed by PWB→SI. Thus, all the direct paths (JD→SI and JR→SI) and the indirect paths (JD→PWB→SI and JR→PWB→SI) were significant.

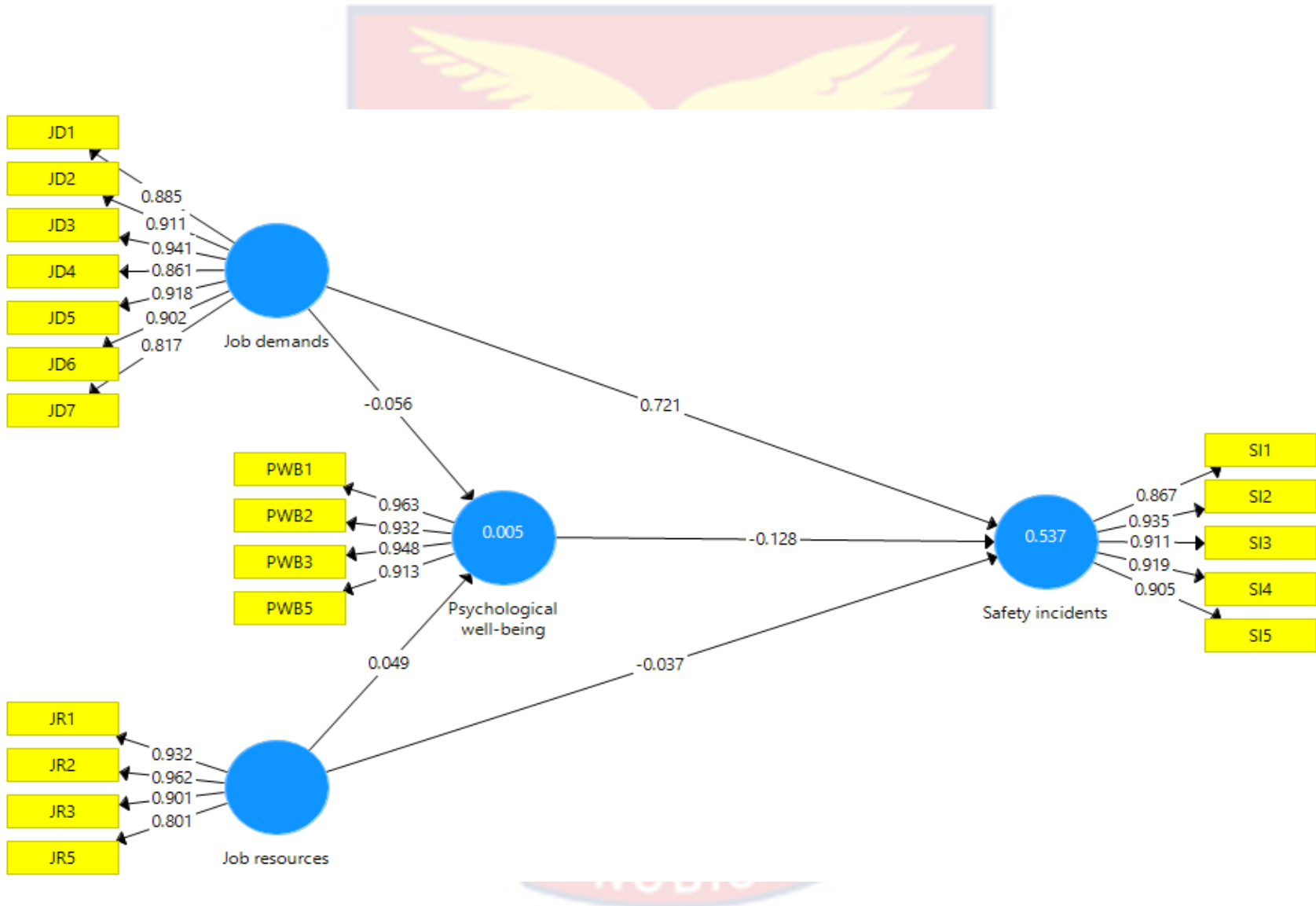


Figure 12: PLS-SEM reflective model predicting PWB and SI from JD and JR

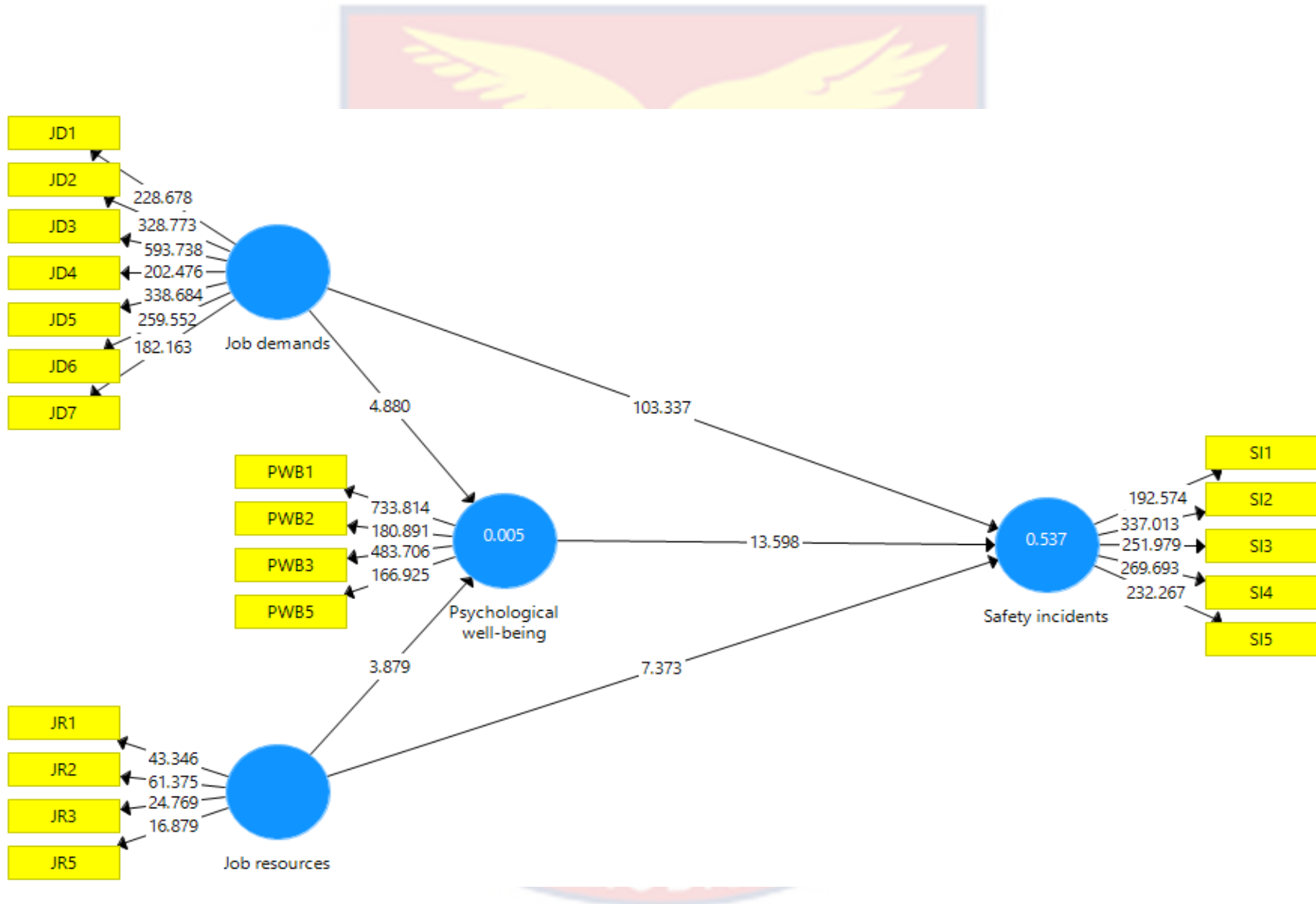


Figure 13: Summary results of the bootstrapping procedure predicting PWB and SI from JD and JR

The mediation test using the bootstrapping approach indicated a direct significant effect of JD ($t=103.337, p=0.000$) and JR ($t=9.451, p=0.000$) on SI (see Table 17). The direct effects of JD→SI ($t=103.817, p=0.000$) and JR→SI ($t=7.373, p=0.000$) were still significant in the presence of the mediator (PWB). Though there is a reduction in the strength and significance of the direct effects of JD and JR on SI, an evaluation of the indirect effects (JD→PWB→SI and JR→PWB→SI) was needed to conclude the mediation role of PWB. The indirect paths, JD→PWB→SI ($t=5.230, p=0.000$) and JR→PWB→SI ($t=3.790, p=0.000$) were all significant at $t > 1.96$ at $p < 0.05$ (see Figure 13, Table 17). Since JD and JR still had a significant effect on SI in the presence of PWB, then PWB played a partial mediating role in the influence of JD and JR on SI among long-distance bus drivers (Hair et al., 2021). Thus, PWB of the bus drivers reduced the effects of JD and JR on safety outcomes as the drivers are on the road. Perhaps, improving the PWB through high PSC may help eliminate the current work stress and risky on-the-road behaviours of the bus drivers and help improve driving performance. However, in a situation of impaired PWB, bus drivers may be overwhelmed by the high JD and Low JR and, hence, increased risky driving behaviours leading to increased safety incidents on our road and attendant on-the-road burdens.

The finding further indicates that if transport managers, owners and station masters take rational and practical steps in improving the PWB of the drivers, the effect of high JD and low JR on SI would be absorbed by PWB (Yulita et al., 2020). Previous studies have confirmed the partial mediation role of well-being on the effect of JD on job performance (Chung et al., 2015; Darvishmotevali & Ali, 2020; Lopez-Martin & Topa, 2019; Rasool et al., 2021; Zhou et al., 2020) as well as the effect of JR on job performance (Skaalvik & Skaalvik, 2018).

This finding indicates that the PWB of the bus drivers has a significant influence on their act of committing SI on the road, especially where the work environment contains a high level of work stress. Thus, PWB is an ameliorating work factor whose high presence among the drivers is perceived to control the negative effect of high JD and low JR on driving performance (Peng et al., 2020). Though every work comes with some number of demands, in highly physically and psychologically demanding and monotonous work like that of long-distance bus driving, improved PWB will be essential in reducing the drivers' on-the-road accidents (Demerouti et al., 2001). Therefore, to improve the PWB of the drivers, there is a need to increase the PSC of the road transport industry to help increase JR like social support and reduce the physical and psychological work demands on the bus drivers (Bakker, & Demerouti, 2018). PSC as an organisation variable precedes safe work design for long-distance bus drivers for the safety and well-being of the drivers, improves safe driving and reduces on-the-road accidents and attendant injuries, fatalities and economic losses (Bakker, & Demerouti, 2017).

The mediation role of PWB on the effect of JD and JR on SI implies that modern OHS interventions and best practices in commercial road transport business are needed to create a safe work environment for the improved well-being of these drivers. However, it is worth noting that the effect of safe work on PWB is not cast in stone, but efforts are needed especially from top management of bus transport companies, driver unions and car owners to train and encourage the drivers to utilise the support systems available in their work environment (Dollard et al., 2019). Hence, the ability of senior management and supervisors of bus transport business to safeguard the well-being and safety of their drivers will resonate in the provision

of adequate material and human resources to create decent and safe work for these vulnerable occupational groups (Longman et al., 2021; Peters et al., 2021).

The psychosocial work stressors available in the work environment of the long-distance bus drivers such as shift work, irregular work schedules, long driving hours, less job control and social support, lone driving and poor remuneration pose a serious threat to their PWB (Useche et al., 2021). Unfortunately, impaired PWB of these drivers will translate into impaired driving performance because impaired PWB cannot absorb the detrimental effect of precarious working conditions on their driving performance. The resultant effect is increased road crashes.

The mediating role of PWB on the effect of JD and JR on SI presents a window of opportunity for the present and future health, well-being and safety of long-distance bus drivers and other professional drivers to be safeguarded to prevent accidents on the roads and promote safety of life and property. This can mostly be realised by eliminating the precarious working conditions of the bus drivers and creating safe work values and ethics that prioritise their health and well-being. This also calls for the enforcement of OHS standards to promote industry best practices to complement the institution of effective and modern OHS policies in the transport sector.

The theoretical implications of these findings are substantial and offer valuable insights into the complex interplay between psychosocial work factors, PWB, and SI among long-distance bus drivers. The results underscore the pivotal role of PWB as a mediator in the relationship between JD and JR and SI, aligning with established theoretical frameworks such as the JD-R model. This mediation role of PWB illuminates the nuanced pathway through which work-related stressors and resources influence safety outcomes. It not only confirms the health erosion

hypothesis but also emphasises the significance of fostering PWB as a protective factor against the negative effects of high JD and low JR. Additionally, the findings underscore the vital role of organisational PSC as an overarching factor that can indirectly shape PWB and SI by influencing JD and JR. These theoretical implications highlight the need for comprehensive and targeted interventions to improve the well-being and safety of long-distance bus drivers, with a particular focus on enhancing PWB and increasing PSC within the transportation industry. The theoretical implications also emphasise the significance of integrating modern OHS practices and policies to ensure the well-being and safety of these drivers, ultimately contributing to road safety and public welfare.

Research Question 6: To What Extent does PSC Moderate the Influence of Job Demands and Job Resources on Psychological Well-being and Safety Incidents among Long-distance Commercial Drivers in Ghana?

The purpose of this analysis was to explore the moderating role of PSC in the relation of JD and JR on the PWB and SI (see Figures 2, 6, 7 and 8). The moderating roles of PSC on the paths JD->PWB, JR->PWB and PWB->SI were tested simultaneously in the path model (Figure 2). The interaction terms were created using the two-stage approach since constructs were reflectively modelled and the analysis was aimed at determining if PSC exerts a significant influence on the association between JD->PWB, JR->PWB and PWB->SI. Moreover, Hair et al. (2021) argued that the two-stage approach yields a high level of statistical power in creating an interaction term.

Using the two-stage approach in creating the interaction term, the predictors (JD, JR and PWB) and the moderator (PSC) were estimated and multiplied to create the interaction terms [Moderating effect 1, 2 and 3 for the paths JD->PWB, JR->PWB and PWB->SI respectively] (see Figure 14). For instance, JD was multiplied

by the PSC to create the term for the moderation effect 1 (see Figure 14), JR and PSC multiplied to create the interaction term for the moderating effect 2. Finally, PWB and PSC were multiplied to create the interaction term for the moderating effect 3. The moderating model was then evaluated, where the moderating variable was assessed to make sure it meets all relevant criteria such as reliability and validity using the outer loadings, composite reliability, and convergent and discriminant validity. However, the interaction term was not assessed since it was measured using auxiliary measurement (single item). The PLS results revealed that the moderating variable (PSC) had outer loadings between 0.763 and 0.887 with acceptable composite reliability, 0.961 (see Figure 14), based on the cut-off point of 0.70 (Hair et al., 2014).

Table 18: Average Variance Extracted (AVE) and Fornell and Larcker (1981) Criterion for Discriminant Validity

Latent construct	AVE	JD	JR	PSC	PWB	SI
JD	0.795	0.891				
JR	0.797	0.119	0.893			
PSC	0.675	-0.012	-0.811	0.822		
PWB	0.880	-0.051	0.041	-0.029	0.938	
SI	0.824	0.721	0.040	-0.001	-0.166	0.908

The AVE of the moderating variable is 0.675 (see Table 18), which means that the outer loadings account for about 68 percent of the variance in PSC (Hair et al., 2014). In addition, the convergent validity of the moderating variable (PSC) is established (> 0.50). Furthermore, the Fornell and Larcker's (1981) criterion was used to establish the discriminant validity of PWB (see Table 18). Moreover, the

HTMT ratio correlation values were less than one, which further confirmed the discriminant validity of PSC (see Table 19).

Table 19: Heterotrait-monotrait Ratio of Correlations of the Path Model

Latent construct	JD	JR	PSC	PWB
JD				
JR	0.146			
PSC	0.139	0.854		
PWB	0.065	0.076	0.088	
SI	0.751	0.065	0.112	0.16

The interaction terms (Moderation effect 1, 2 and 3) were then assessed for their significance using the bootstrapping approach in the SmartPLS. The moderating effects of PSC on the paths, JD->PWB, JR->PWB and PWB->SI, were significant [p -value <0.05] (see Figure 15). Thus, the moderating role of PSC on the influence of JD and JR on PWB and the influence of PWB on SI is conclusive. It is also essential to understand the contribution of PSC to explaining the exogenous constructs (PWB and SI). Hence, the f^2 was assessed to indicate the contribution PSC makes towards explaining the PWB and SI of the drivers. The f^2 value of 0.05, .01 and .025 denote small, moderate, and high f^2 respectively (Kenny, 2018). The results of f^2 of the paths are presented in Table 20.

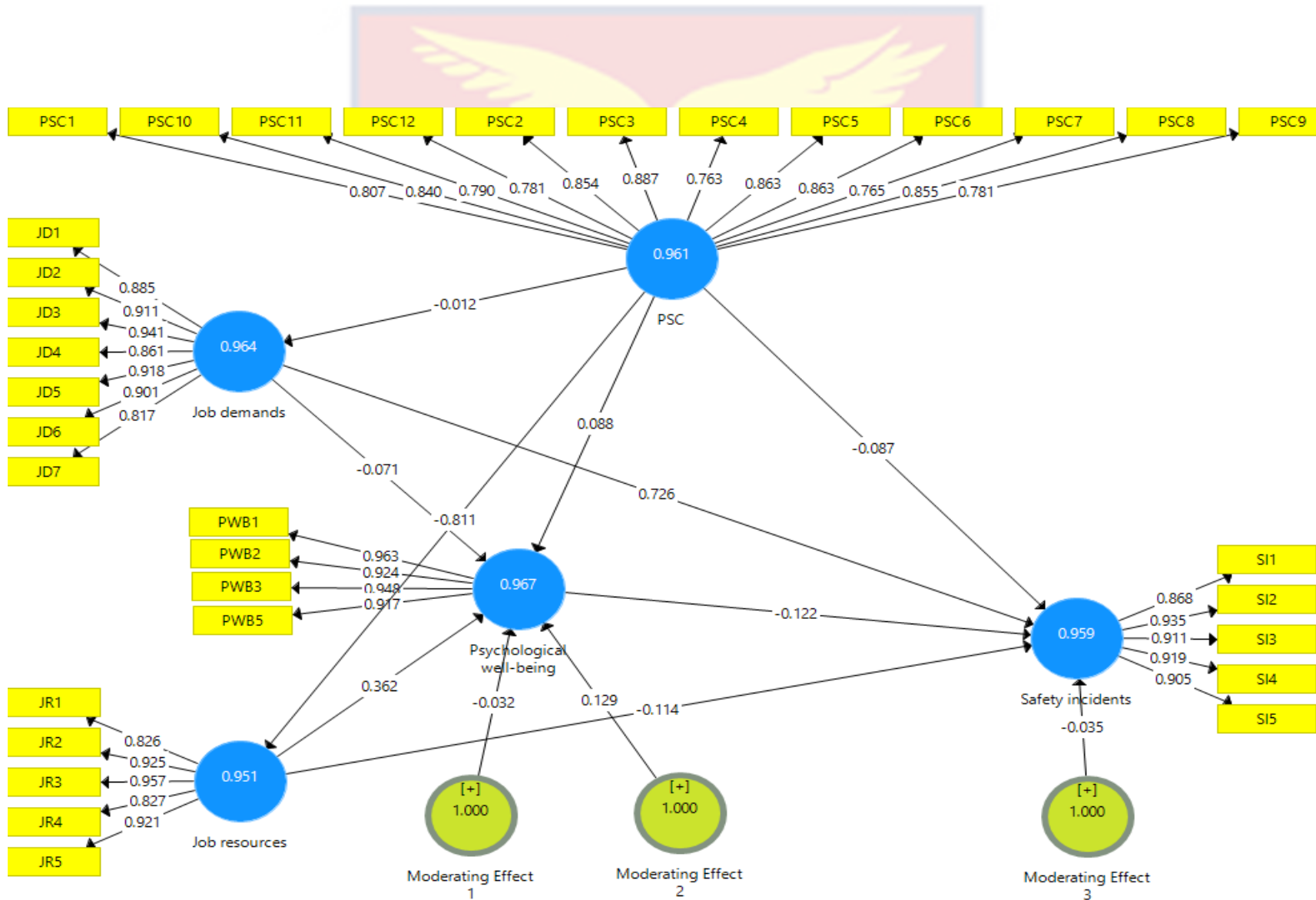


Figure 14: Interaction term created using the two-stage approach in smart PLS-SEM

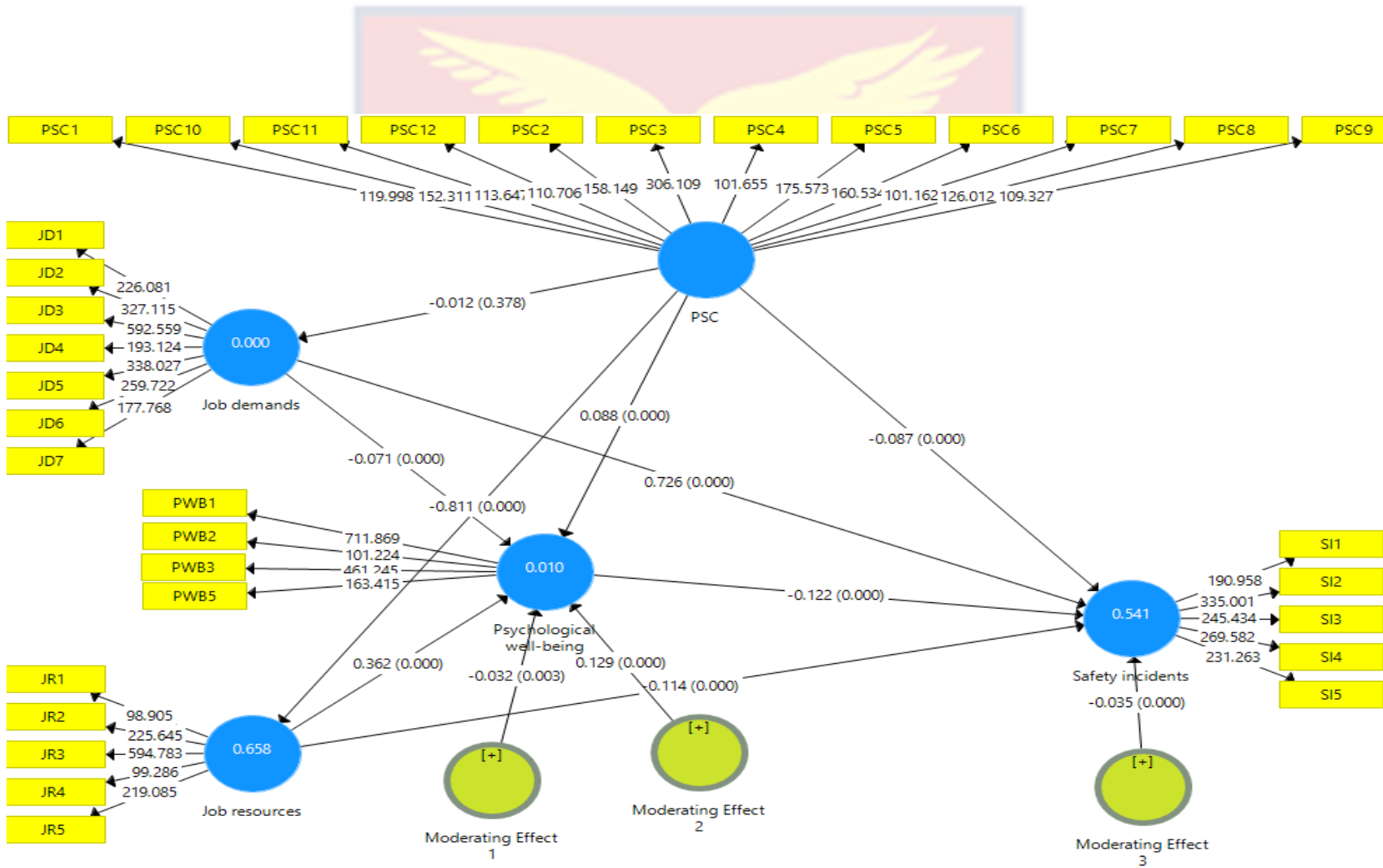


Figure 15: Summary results of the bootstrapping procedure for the moderating effect of PSC on the paths JD→PWB, JR→PWB and PWB→SI

The results revealed that PSC is making a small ($f^2 < 0.005$) but significant contribution in explaining PWB [moderating effect 2] ($t=4.080$; $p < 0.05$) and SI [Moderating effect 3] ($t=2.314$; $p < 0.05$), and a small ($f^2 < 0.005$) non-significant contribution in explaining PWB [Moderation effect 1] ($t=1.510$; $p > 0.05$). To understand the influence PSC has on the paths JD→PWB, JR→PWB and PWB→SI slope plots were used to illustrate the results of the moderation analysis.

Table 20: Effect Sizes (Cohen f^2) of the Path Coefficients

Path	f^2	SD	T Statistics	P-values
JD → PWB	0.005	0.002	2.704	0.007
JD → SI	1.103	0.044	25.265	0.000
JR → PWB	0.005	0.001	5.198	0.000
JR → SI	0.009	0.001	6.845	0.000
Moderating Effect 1 → PWB	0.001	0.001	1.510	0.131
Moderating Effect 2 → PWB	0.003	0.001	4.080	0.000
Moderating Effect 3 → SI	0.002	0.001	2.314	0.021
PSC → JD	0.000	0.000	0.338	0.736
PSC → JR	1.925	0.081	23.865	0.000
PSC → PWB	0.002	0.001	1.803	0.072
PSC → SI	0.006	0.001	4.871	0.000
PWB → SI	0.031	0.005	6.641	0.000

SD = Standard deviation.

The slope plot shows that for a low PSC (-1 standard deviation below the mean; blue line), there is a weaker negative relationship (flatter line) between JD and PWB (see Figure 16). Meanwhile, for high PSC (+1 standard deviation above

the mean; green line), the slope is steeper, showing a strong negative relationship between JD and PWB. Thus, increasing the organisational PSC translates into stronger PWB for the drivers as they are likely to perceive lower JD. However, PSC did not make a practical direct significant contribution to increasing the PWB of these drivers. Perhaps, the low level of PSC in the work environment of the bus drivers accounted for the non-significant contribution to increasing the PWB of the drivers. Thus, in a stressful, high demanding and monotonous work environment like that of the bus drivers, high level PSC is needed to help protect the well-being and health of the drivers.

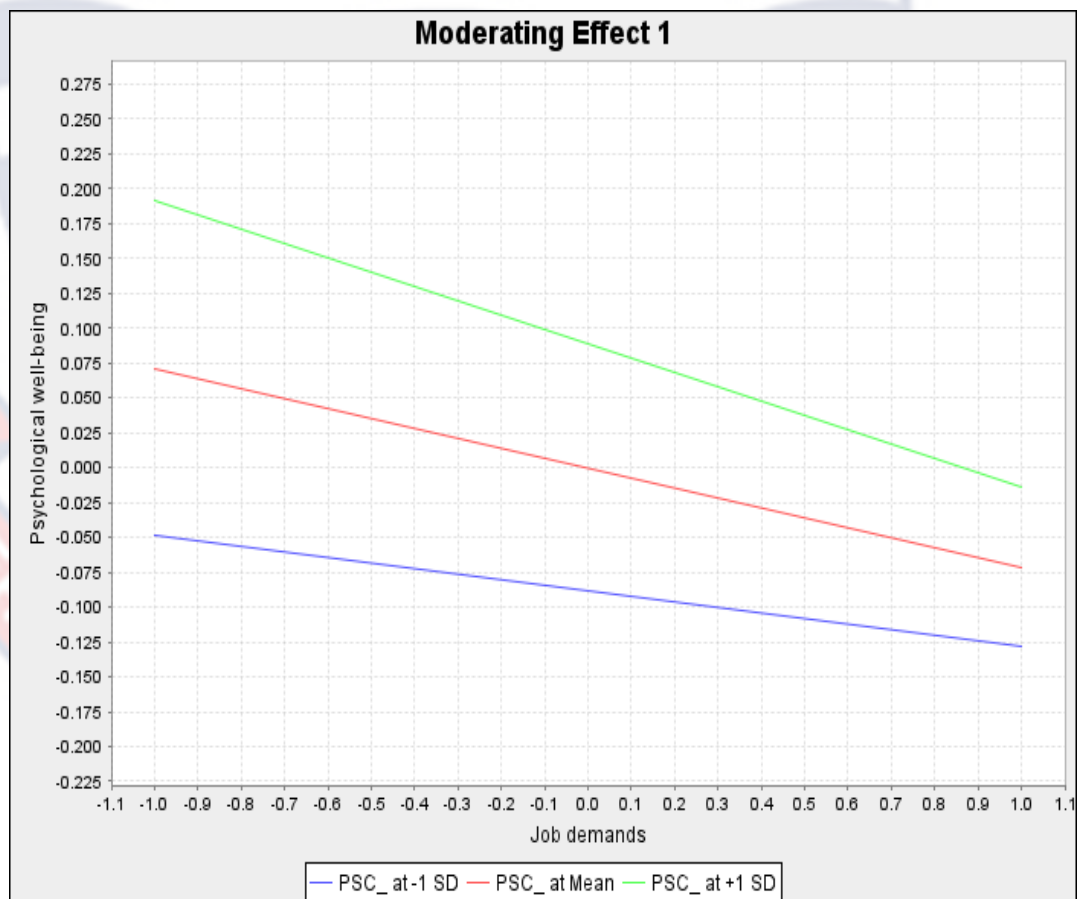


Figure 16: Slope plot of the moderating role of PSC on the influence of JD on PWB

The significant moderating role of PSC on the effect of JD on PWB has been confirmed in several similar studies (Dollar et al., 2012; Hall et al., 2013; Bronkhorst, 2015; Loh et al., 2018; Tagoe, & Amponsah-Tawiah, 2019). In the PSC theory, PSC possesses a secondary function of buffering the harmful effect of a debilitating job on the psychological health and well-being of professional drivers (Dollard et al., 2019). This means that PSC is an essential organisational level resource located at an upstream level which has the power to buffer physically and psychologically demanding working conditions among the lower cadre of workers.

The non-significant but practical contribution of PSC in explaining PWB among the drivers in this study may be due to the low level of PSC in the transport sector of the country. In other words, a high level of PSC is needed to help improve the PWB of the drivers by reducing the harmful effect of the current high JD in their daily schedules. This is because higher PSC transport organisations are expected to be a work environment characterised by a high level of job resources including improved social support from supervisors and co-workers to assist these drivers to complete their daily tasks and achieve organisational goals. Moreover, the low level of PSC in the industry is not providing cues enough to confer and support drivers' well-being. Mostly, PSC serves as a safety signal that provides essential cues about PWB and provides safety in the work environment for the drivers to access, utilise and request more resources to meet the demands of their work (Loh et al., 2018). This function of PSC becomes insignificant especially when bus drivers perceive a low level of organisational PSC and that little or no priority is given to their health and well-being.

Efforts in creating a high level of conducive working atmosphere in the transport industry in Ghana do not always lie in the space of bus owners and managers of bus transport companies. The driver unions, station masters and labour regulatory bodies also have a role to play. The latter has to ensure that bus drivers work under conducive conditions, and, where necessary, have access to resources and support to deal with precarious working conditions such as lone driving, irregular work schedules, long-driving hours, job insecurity and sales or performance-based payment schemes. In such driving spheres, drivers are likely to have a high level of concentration needed for safe driving that prevents accident.

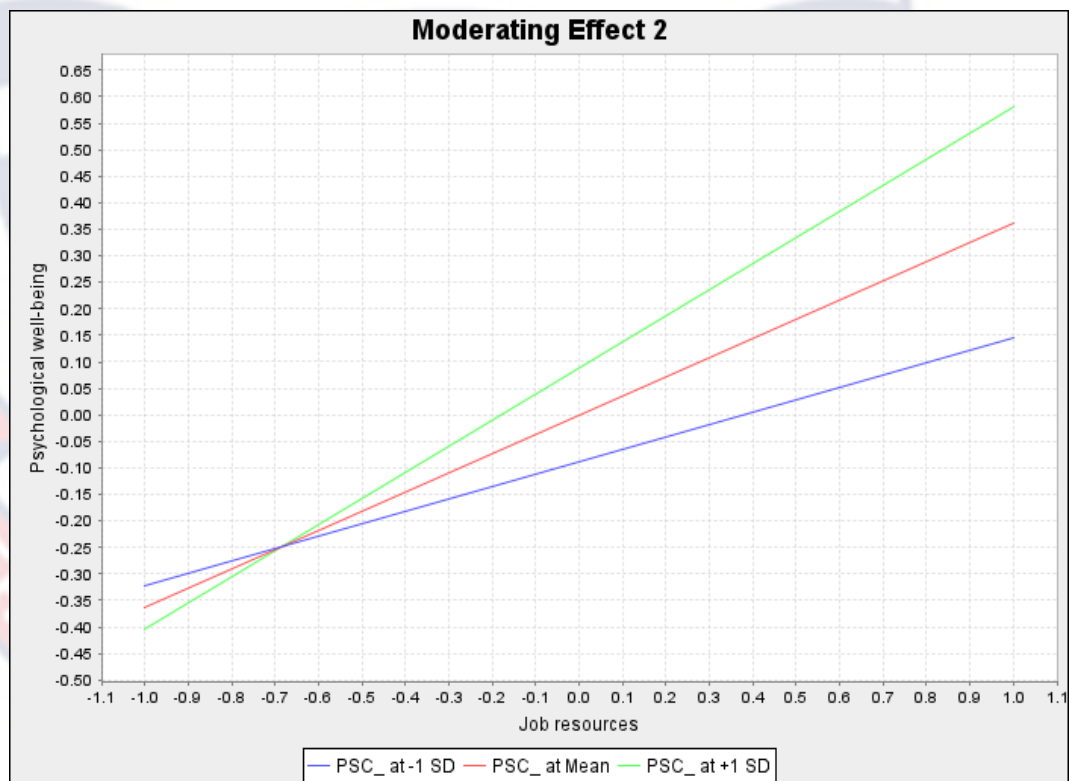


Figure 17: Slope plot of the moderating role of PSC on the influence of JR on PWB

Further analysis using the slope plot (Figure 17) shows that at a low PSC (-1 standard deviation below the mean; blue line), there is a weaker (flatter line) and positive relationship between JR and PWB. Moreover, at a high PSC (+1 standard

deviation above the mean; green line), there is a strong (steeper line) and positive relationship between JR and PWB. This means that increasing PSC may lead to increased PWB for these drivers.

The moderating role of PSC on the influence of JR on PWB of the drivers has been confirmed by a previous study (Yulita et al., 2020). This finding implies that efforts directed toward increasing PSC in bus transport businesses are most likely to involve drivers in the design of their work schedules and make resources available for drivers to utilise. This will lead to improved psychological health and well-being of the bus drivers. PSC functions as a safety signal that indicates when it is safe and appropriate to use resources available to reduce aversive psychosocial stimuli in the work environment of the bus drivers (Yulita et al., 2020). This secondary function of PSC helps to ameliorate the effect of JD and JR interaction to improve the PWB of the bus drivers (Loh et al., 2018; Niedhammer, Bertrais, & Witt, 2021).

Psychological distress is harmful with devastating outcomes such as depression, anxiety and impaired driving performance (Yulita et al., 2016). Fortunately, social support would be an essential resource for drivers who are dealing with unpleasant working experiences. For instance, a bus transport company or business with a high level of PSC will signal bus drivers that the organisation has concern and support for workers and that it is safe and essential to utilise these available resources for improved well-being that promotes safe driving. Therefore, JR and PSC need to be improved to have a positive effect on the PWB of the bus drivers. Even if JR is high, unless PSC is also high (PSC may be needed to even

drive JR), the PWB of these drivers cannot be improved for safe driving, fewer accidents, injuries, fatalities and associated social and economic consequences.

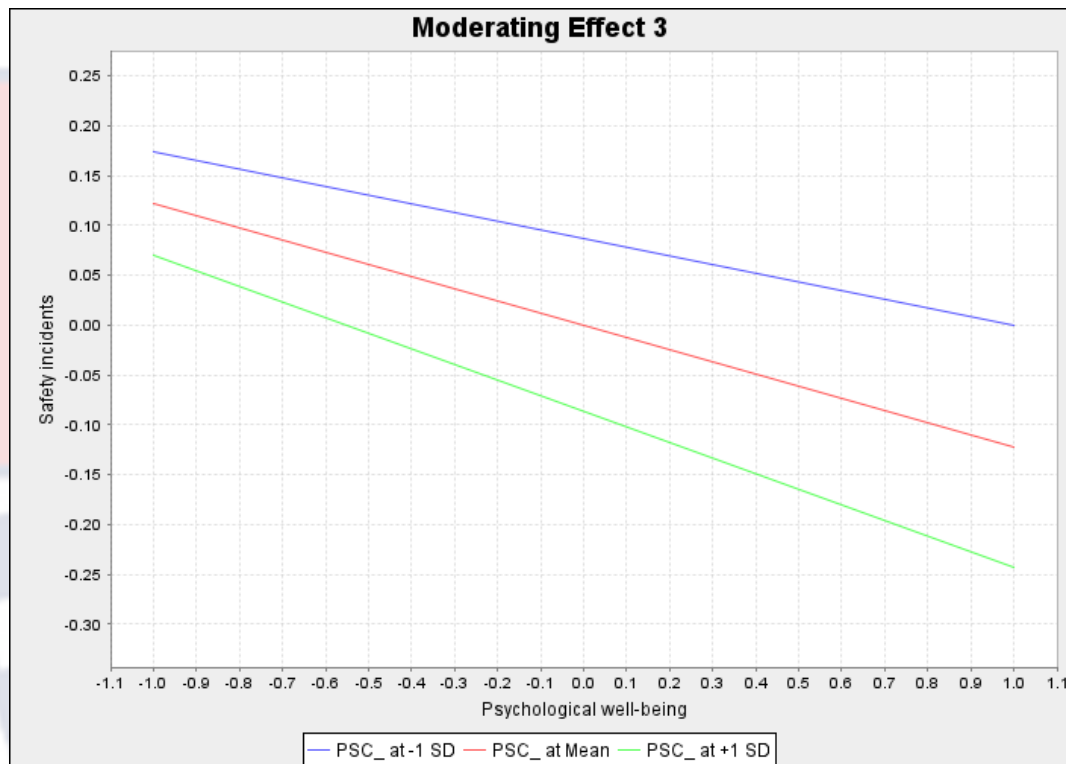


Figure 18: Slope plot of the moderating role of PSC on the influence of PWB on SI

It can be observed that at a low organisational PSC (-1 standard deviation below the mean; blue line), there is a weaker (flatter line) and negative relationship between PWB and SI (see Figure 18). Meanwhile, for high PSC (+1 standard deviation above the mean; green line), the slope is steeper, showing a strong negative relationship between PWB and SI. Thus, increasing the organisational level PSC will translate into high PWB which will, in turn, reduce SI for long-distance bus drivers. In that case, increasing PSC may make a small but significant practical contribution to explaining the tendency of these drivers to get involved in risky behaviours, which may lead to accidents, while they are on the road.

The moderation role of PSC on the influence of PWB and SI also confirms the PSC theory that a bus transport operation with a high level of PSC can reduce safety incidents significantly through improved PWB (Dollard et al., 2019). This finding implies that even if bus drivers have a high level of PWB, high levels of PSC are still needed for PWB to have a significant impact on reducing the level of safety among long-distance bus drivers on the road. Perhaps, bus drivers with improved well-being may be more confident in accessing and utilising resources available in their work environment to manage safety issues on the road. In that case, if bus owners and managers of bus transport companies care about their drivers' well-being and safety, they will need to commit resources and be willing to offer constructive feedback to the drivers based on their safety records. This situation does not just boost drivers' PWB but also creates a conducive avenue for communication and allows these drivers to demand and obtain necessary resources to help deal with the daily demands of work and any psychosocial hazards that may impede their well-being (Dollard et al., 2019; Yulita et al., 2020).

High PSC serves as an essential organisational resource that may help long-distance bus drivers to cope with high job demands, and improve their PWB and driving performance. Also, PSC in road transport companies and businesses may boost the psychological benefits that drivers gain from achieving good daily recovery outside of work. Additionally, improving PSC in the road transport industry may help create a healthy and decent industry and companies where the well-being of bus drivers is given priority, and regular feedback is obtained from drivers to ensure continuous dedication to promoting a decent work value. The moderating role of PSC in this study implies that industry players such as the driver unions, bus transport companies and Ghana Road Safety Commission need to take

policy actions to improve PSC within the activities of transport companies. Improved PSC among long distance bus drivers will lead to improved health and psychological well-being as well as high driving performance. It is also worth noting that the assessment of PSC in road transport operations will assist bus owners, managers of bus transport companies and station masters to identify the level of PSC and other domains to target in order to protect and promote the PWB of the bus drivers and also reduce safety incidents on our roads.

The theoretical implications of these findings provide a valuable perspective on the intricate role of PSC in moderating the relationships between JD, JR, PWB, and SI among long-distance bus drivers. The study reveals that PSC exerts a significant moderating influence on the path between JD and PWB, JD and SI, and JR and PWB, while its influence on the path between PWB and SI is non-significant but practical. These results highlight the crucial role of PSC as an organisational-level buffer that can mitigate the negative impact of high JD and low JR on PWB and SI, aligning with the PSC theory. The findings emphasise the importance of creating and fostering a high level of PSC within the road transport industry, as it contributes to enhanced PWB and reduced SI among drivers. Furthermore, these results underscore the significance of PSC as a safety signal that guides drivers in utilising available resources and support systems, ultimately promoting their well-being and safe driving practices. The theoretical implications suggest that industry stakeholders, including driver unions, bus owners, and transport companies, need to prioritise the enhancement of PSC as a means to protect and improve the perceived PWB and safety of long-distance bus drivers, thereby ensuring road safety and public welfare.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the summary, main findings, conclusions and recommendations.

Summary

Occupational health and safety promotion creates standards that help to promote decent, healthy and safe work environment for every worker. A decent, healthy, and safe work environment protects workers by ensuring that work is not hazardous and poses minimal or no risk to workers' health, well-being and safety.

Workplace safety incidents are a major source of injuries, illnesses and mortality. However, countries and industries that have fully integrated OHS standards into their operations have made significant efforts to reduce occupational injuries, illness and deaths. Thus, they have put the right mechanisms in place for protecting the health, safety and well-being of their workers, increasing worker morale, productivity and organisational returns, and boosting corporate image.

The road transport industry is among the most hazardous works in the world because professional drivers are exposed to a wide range of health and safety issues while on the road. Unfortunately, in the road transport industry, issues of SI do not just affect drivers, but also passengers and other road users. For the past decade, about eight people have died each day on Ghana's roads, and commercial buses account for most (about 36%) of the injuries and casualties on these roads. The economic cost of these injuries, disabilities and fatalities on the driver, family or relatives, and the nation is devastating. For instance, each household spends an average of 1,688 US dollars yearly due to direct and indirect costs associated with road crashes. Also, about 1.6% of Ghana's gross domestic product is spent on road

traffic crashes (Blankson & Lartey, 2020). Safety incidents on Ghana's roads also put pressure on its already weak healthcare system that is burdened and facing challenges in delivering health care for everyone. Issues of road traffic crashes are getting worse and scarier each day in the country.

Several efforts have been directed towards reducing road traffic accidents in Ghana but have not yielded any significant results. Perhaps, most efforts have been in behavioural safety interventions focused on correcting risky driving behaviours, but ignoring the conditions under which professional drivers, especially bus drivers are working. Meanwhile, recent evidence has shown that the psychosocial working conditions or factors that exist in the work environment of professional drivers are precarious and are predominantly responsible for risky driving behaviours leading to other occupational health issues and road traffic accidents. Thus, low organisational psychosocial issues expose drivers to fatigue, job strain, long driving hours, and work-family conflicts. Similarly, it further exposes them to high JD, low JR, shift work, effort-rewards imbalance, lone driving, pressure to meet daily sales targets, and irregular work schedules, all of which create a conducive atmosphere for increased SI on the roads. These psychosocial factors create a hazardous work environment that defeats the purpose of safe work values and ethics, and poses a significant threat to the lives of drivers, passengers and other road users, causing a huge loss of productivity.

In this cross-sectional survey, a 57-item questionnaire was utilised to measure the socio-demographic factors, psychosocial work factors, PWB and SI. The items measured socio-demographic factors (such as sex, age, education level, marital status, type of employment contract, bus ownerships type and type of bus) and some aspects of working conditions and safety outcomes (such as shift work,

lone work, daily driving hours, weekly driving days and history of accidents and near misses). The questionnaire also measured psychosocial factors such as JD, JR, PSC, job insecurity and work-family conflicts. The questionnaire was pretested using 173 commercial bus drivers in the Takoradi Metropolis, which yielded composite reliability between 0.94 and 0.96 and convergent validity between 0.683 and 0.817.

Data were mainly collected from 7315 long-distance bus drivers who commute from Accra and Tema to other parts of the country and the sub-region. With seven research questions stated, mean, frequency and percentage were used to answer research question one. Research Questions Two and Three were analysed using the Kruskal-Wallis H test, and eta squared. In addition, a pairwise comparison with Bonferroni conservative alpha values was calculated to determine where groups difference exists. The PLS-SEM was used to analyse research questions Four, Five and Six.

Main Findings

The following findings were revealed based on the results:

1. There are generally high levels of psychosocial hazards (high daily and weekly driving intensity, shift work, lone driving, work-family conflict, job insecurity, high job demands, low job resources like social support, and low PSC among the long-distance bus drivers in Ghana.
2. Long-distance bus drivers who drive 41 to 52 hours and more a week are at higher risk and more likely to record high safety incidents or engaged in risky driving behaviours than those who drive 40 hours or fewer in a week.

3. The difference in weekly driving hour intensity depends on the ownership type of the bus. Thus, drivers whose buses are owned by individuals are more likely to record higher weekly driving intensity than those whose buses owned by public and private bus transport companies in Ghana.
4. Job demands, JR, and PSC are direct predictors of psychological well-being and safety incidents. JD is a strong direct predictor of safety incidents and a significant indirect predictor of safety incidents through PWB. JR is also a direct and significant predictor of safety incidents and a significant indirect predictor of SI through PWB. PSC is a significant direct predictor of safety incidents but not psychological well-being.
5. Psychological well-being partially mediated the effect of JD and JR on SI of the drivers.
6. Psychosocial safety climate significantly moderated the influence of JD and JR on PWB and the influence of PWB on SI among the bus drivers.

Conclusions

Based on the findings, the following conclusions are drawn:

1. High levels of psychosocial hazards, encompassing factors like daily and weekly driving intensity, shift work, work-family conflict, and job insecurity, are prevalent among long-distance bus drivers in Ghana. These findings highlight the urgency of implementing targeted interventions and workplace policies to address these hazards and improve the overall well-being of these drivers.
2. Long-distance bus drivers who exceed 40 hours of driving per week are at an elevated risk of safety incidents.

3. The variation in weekly driving hour intensity depending on bus ownership type emphasises the importance of standardising working hour regulations across different ownership types.
4. Job demands, job resources, and psychosocial safety climate are directly associated with the perceived psychological well-being and safety incidents of long-distance bus drivers.
5. The partial mediation of perceived psychological well-being on the effect of job demands and job resources on safety incidents highlights the pivotal role of psychological well-being in enhancing safety outcomes. Interventions should target psychological well-being and equip drivers with stress management and coping strategies.
6. Psychosocial safety climate plays a moderating role in the health erosion hypothesis in the JD-R and the PSC theories. The significant moderating role of psychosocial safety climate underscores the importance of creating a safety-oriented organisational culture.

Recommendations

The following recommendations are based on the conclusions:

1. There is a need to ensure strict compliance with safety standards to deal with psychosocial work stressors such as lone driving, shift work and driving hour limits, especially among long-distance bus drivers in Ghana. Road transport industry regulators such as the Road Safety Commission, MTTD, the Driver Vehicle Licensing Authority and the Ministry of Transport are encouraged to intensify their regular and active engagement with driver unions, car owners, bus transport managers and drivers to provide up-to-date information and

essential OHS issues and provide strategies that can help them to integrate OHS standards into the operations of the road transport industry. The road transport ministry, driver unions and National Road Safety Commission can engage the services of occupational hygienists, academia, industrial psychologists and other OHS experts on ways job resources, job demands, work-family balance and PSC can effectively be managed at the workplace of the bus drivers to reduce psychosocial work hazards.

2. It is pertinent that owners and managers of bus transport businesses and station masters rearrange shifts to reduce working hours to not more than eight hours a day or 40 hours a week. The rate of safety incidents is anticipated to reduce if shift work and driving hour intensity are reduced to the required driving hour limits. Long-distance bus drivers need to be given enough periods for rest to promote recovery after work to prevent fatigue driving, sleep deficits and accumulated fatigue that could lead to road crashes. Bus rest stop policies should be adhered to. Technological techniques can be used to ensure that bus drivers adhere to rest or break stops during driving.
3. There is an urgent need to recruit more drivers to reduce lone driving to daily and weekly driving intensity, especially among drivers whose vehicles are owned by individuals.
4. Owners and managers of bus transport businesses and station masters need to provide adequate job resources such as social support, job control, better remunerations for long-distance bus drivers and prioritise drivers' psychological well-being and safety. Thus, owners and managers of bus transport businesses should design jobs where bus drivers have adequate job resources to deal with job demands. These strategies will create a safe and

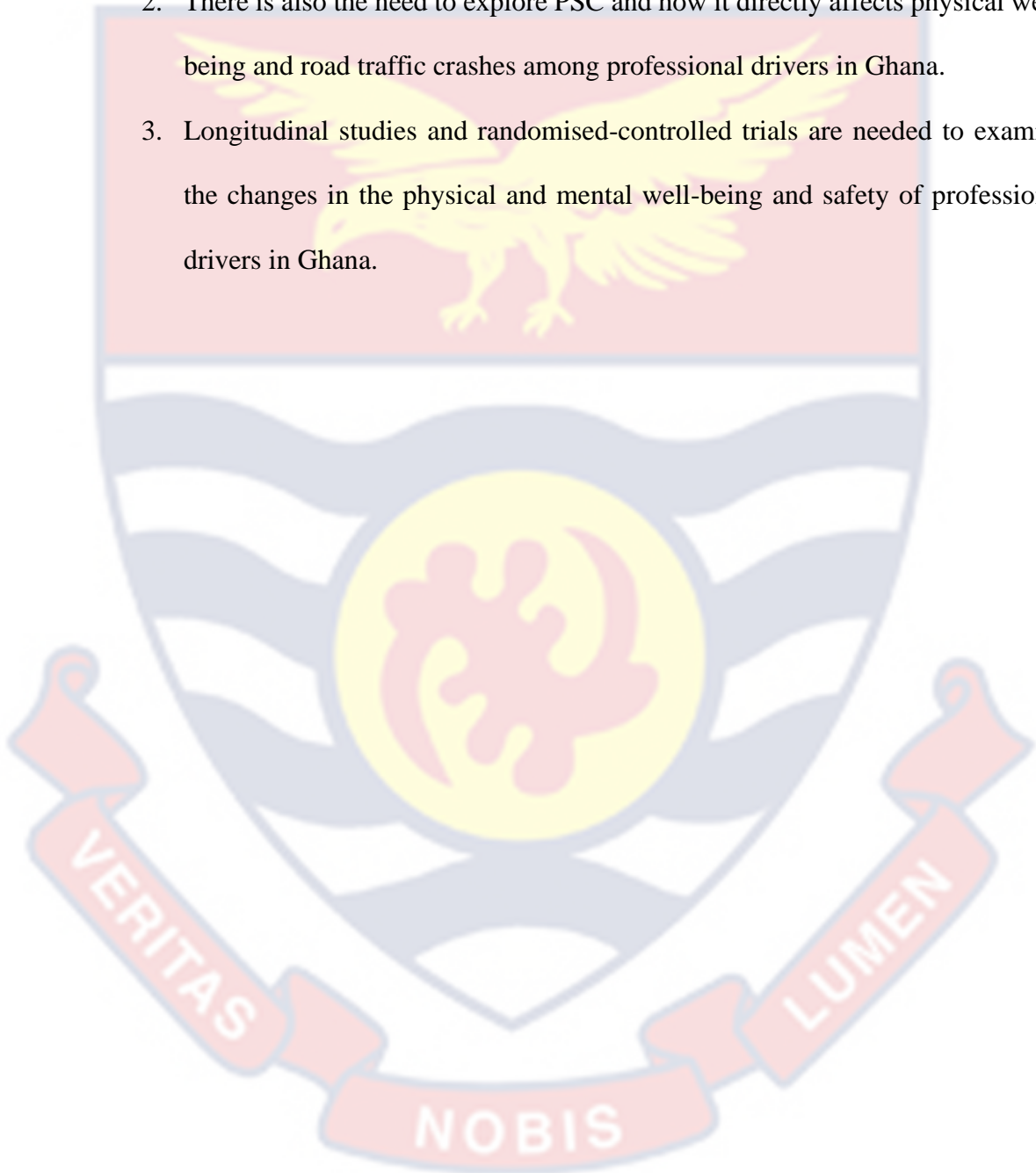
healthy workplace for the promotion and protection of bus drivers' well-being and safety. The gap between academia and practice should be closed through knowledge brokering to help share relevant and empirical evidence that might help create a safe work environment with enough job resources for improved well-being and safety of bus drivers.

5. Job design, health promotion interventions and policies that focus on improving the psychological well-being of bus drivers must be the priority of the managers and owners of bus transport businesses. There is a need to develop a comprehensive OHS policy for the road transport industry and ensure the enforcement of existing policies to protect the dignity and the well-being of drivers. Regular surveillance by the road safety commission, driver unions, managers and owners of transport businesses will help collect data that may help ensure continuous protection of bus drivers' well-being and safety.
6. There is a need to encourage bottom-up communication and ensure the participation of bus drivers in their job design. In addition, bus drivers need to be encouraged to be involved in policies that promote healthy lifestyles and safety behaviours. Also, the well-being of the bus drivers must be the priority of the management and owners of bus transport businesses by providing drivers with appropriate feedback and job resources, and enforcing the application of relevant laws, regulations and safety standards.

Suggestions for Future Studies

The following are proposed for future studies:

1. It is important to explore both the health erosion and motivation hypotheses in the JD-R and PSC theories using long-distance bus drivers and other commercial driver groups in Ghana.
2. There is also the need to explore PSC and how it directly affects physical well-being and road traffic crashes among professional drivers in Ghana.
3. Longitudinal studies and randomised-controlled trials are needed to examine the changes in the physical and mental well-being and safety of professional drivers in Ghana.



REFERENCES

- Adei, D., Braimah, I., & Mensah, J. V. (2019). Occupational health and safety practices among fish processors in Kumasi Metropolitan area, Ghana. *Occupational Health Science* 2019 3(1), 83–102. <https://doi.org/10.1007/S41542-019-00038-0>
- Adei, D., Mensah, A., Agyemang-Duah, W., & KanKam, K. (2021). Economic cost of occupational injuries and diseases among informal welders in Ghana. *Cogent Medicine*, 8(1), 1876338. <https://doi.org/10.1080/2331205x.2021.1876338>
- Adil, M. S., & Baig, M. (2018). Impact of job demands-resources model on burnout and employee's well-being: Evidence from the pharmaceutical organisations of Karachi. *IIMB Management Review*, 30(2), 119–133. <https://doi.org/10.1016/j.iimb.2018.01.004>
- Adriano, J., & Callaghan, C. W. (2020). Work-life balance, job satisfaction and retention: Turnover intentions of professionals in part-time study. *South African Journal of Economic and Management Sciences*, 23(1), 1–12. <https://doi.org/10.4102/sajems.v23i1.3028>
- Agenda for International Development. (2019, April 29). *Achieving the SDG on road traffic accident – Ghana's Perspective - A-id*. Retrieved October 12, 2021, from: <https://www.a-id.org/2019/04/29/achieving-the-sdg-on-road-traffic-accident-ghanas-perspective/>
- Ali, M., Ahsan, G. U., Uddin, Z., & Hossain, A. (2021). Road traffic delays in commuting workplace and musculoskeletal health among sedentary workers: A cross-sectional study in Dhaka city. *Journal of Occupational Health*, 63(1), e12289. <https://doi.org/10.1002/1348-9585.12150>

- Alonso, F., Esteban, C., Gonzalez-Marin, A., Alfaro, E., & Useche, S. A. (2020). Job stress and emotional exhaustion at work in Spanish workers: Does unhealthy work affect the decision to drive? *PLoS One*, *15*(1), e0227328. <https://doi.org/10.1371/journal.pone.0227328>
- Alonso, F., Esteban, C., Sanmartín, J., & Useche, S. A. (2017). Reported prevalence of health conditions that affect drivers. *Cogent Medicine*, *4*(1), 1303920. <https://doi.org/10.1080/2331205x.2017.1303920>
- Alonso, F., Esteban, C., Useche, S., López de Cózar, E., & Useche, S. (2016). Prevalence of physical and mental fatigue symptoms on Spanish drivers and its incidence on driving safety. *Advances in Psychology and Neuroscience*, *1*(2), 10–18. <https://doi.org/10.11648/j.apn.20160102.12>
- Amfo-Otu, R., & Agyemang, J. K. (2016). Occupational health hazards and safety practices among the informal sector auto mechanics. *Applied Research Journal*, *2*(1), 59-69.
- Amissah, J., Agyei-Baffour, P., Badu, E., Agyeman, J. K., & Badu, E. D. (2019). The cost of managing occupational injuries among frontline construction workers in Ghana. *Value in Health Regional Issues*, *19*, 104–111. <https://doi.org/10.1016/J.vhri.2019.06.002>
- Amponsah-Tawiah, K., & Dartey-Baah, K. (2011). Occupational health and safety: key issues and concerns in Ghana. *International Journal of Business and Social Science*, *2*(14), 119–126.
- Amponsah-Tawiah, K., & Mensah, J. (2016). Occupational health and safety and organisational commitment: Evidence from the Ghanaian mining industry. *Safety and Health at Work*, *7*(3), 225–230. <https://doi.org/10.1016/j.shaw.2016.01.002>

- Amponsah-Tawiah, K., Ntow, M. A. O., & Mensah, J. (2016). Occupational health and safety management and turnover intention in the Ghanaian mining sector. *Safety and Health at Work*, 7(1), 12–17. <https://doi.org/10.1016/j.shaw.2015.08.002>
- Annan, J. S., Addai, E. K., & Tulashie, S. K. (2015). A call for action to improve occupational health and safety in Ghana and a critical look at the existing legal requirement and legislation. *Safety and Health at Work*, 6(2), 146–150. <https://doi.org/10.1016/J.shaw.2014.12.002>
- Ansah, E. W., & Mensah, J. K. O. (2020). Mediating effect of psychosocial safety climate and job resources in the job demands-health relation: Implications for contemporary business management. *American International Journal of Business Management*, 3(8), 74–83.
- Ansah, E. W., & Mintah, J. K. (2012). Safety management practices at fuel service stations in Central and Western Regions of Ghana. *Nigerian Journal of Health Education*, 16(1), 78-89.
- Ansah, E. W., Mintah, J. K., & Ogah, J. K. (2018). Psychosocial safety climate predicts health and safety status of Ghanaian fuel attendants. *Universal Journal of Public Health*, 6(2), 63–72. <https://doi.org/10.13189/ujph.2018.060205>
- Anto, E. O., Owiredu, W. K. B. A., Adua, E., Obirikorang, C., Fondjo, L. A., Annani-Akollor, M. E., & Donkor, S. (2020). Prevalence and lifestyle-related risk factors of obesity and unrecognized hypertension among bus drivers in Ghana. *Heliyon*, 6(1), e03147. <https://doi.org/10.1016/J.heliyon.2019.E03147>

- Appiagyei, H., Nakua, E. K., Donkor, P., & Mock, C. (2021). Occupational injuries among health care workers at a public hospital in Ghana. *The Pan African Medical Journal*, 39(103), 1-13. <https://doi.org/10.11604/PAMJ.2021.39.103.23542ss>
- Aram, S. A. (2021). Managing occupational health among goldminers in Ghana: Modelling the likelihood of experiencing occupational related health problems. *Plos One*, 16(7), e0254449. <https://doi.org/10.1371/journal.pone.0254449>
- Ariza-Montes, A., Arjona-Fuentes, J. M., Han, H., & Law, R. (2018). Work environment and well-being of different occupational groups in hospitality: Job Demand–Control–Support model. *International Journal of Hospitality Management*, 73, 1–11. <https://doi.org/10.1016/j.ijhm.2018.01.010>
- Ariza-Montes, A., Leal-Rodríguez, A. L., Ramírez-Sobrino, J., & Molina-Sánchez, H. (2019). Safeguarding health at the workplace: A study of work engagement, authenticity and subjective wellbeing among religious workers. *International Journal of Environmental Research and Public Health*, 16(17), 3016. <https://doi.org/10.3390/ijerph16173016>
- Asumeng, M., Afful, J., & Badu-Agyemang, C. (2015). Occupational safety and health issues in Ghana: Strategies for improving employee safety and health at workplace. *International Journal of Business and Management Review*, 3(9), 60–79.

- Atombo, C., Wu, C., Tettehfiio, E. O., Nyamuame, G. Y., & Agbo, A. A. (2017). Safety and health perceptions in work-related transport activities in Ghanaian industries. *Safety and Health at Work*, 8(2), 175–182. <https://doi.org/10.1016/J.shaw.2016.10.002>
- Babbie, E. R. (1973). *Survey Research Methods*. Belmont, CA.: Wadsworth Publishing Co.
- Babbie, E. R. (2021). *The practice of social research* (15th ed.). Boston, USA: Cengage.
- Badri, A., Boudreau-Trudel, B., & Souissi, A. S. (2018). Occupational health and safety in the industry 4.0 era: A cause for major concern? *Safety Science*, 109, 403-411. <https://doi.org/10.1016/j.ssci.2018.06.012>
- Bailey, T. S., Dollard, M. F., & Richards, P. A. M. (2015). A national standard for psychosocial safety climate (PSC): PSC 41 as the benchmark for low risk of job strain and depressive symptoms. *Journal of Occupational Health Psychology*, 20(1), 15–26. <https://doi.org/10.1037/a0038166>
- Bailey, T. S., Dollard, M. F., Mclinton, S. S., & Richards, P. A. (2015). Psychosocial safety climate, psychosocial and physical factors in the etiology of musculoskeletal disorder symptoms and workplace injury compensation claims. *Work & Stress*, 29(2), 190–211. <https://doi.org/10.1080/02678373.2015.1031855>
- Baka, Ł., & Baka, Ł. (2015). Does job burnout mediate negative effects of job demands on mental and physical health in a group of teachers? Testing the energetic process of Job Demands-Resources model. *International Journal of Occupational Medicine and Environmental Health*, 28(2), 335–346. <https://doi.org/10.13075/ijomeh.1896.00246>

- Bakker, A. B., & Demerouti, E. (2017). Job demands-resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. <https://doi.org/10.1037/ocp0000056>
- Becher, H., Dollard, M. F., Smith, P., & Li, J. (2018). Predicting circulatory diseases from psychosocial safety climate: A prospective cohort study from Australia. *International Journal of Environmental Research and Public Health*, 15(3), 415. <https://doi.org/10.3390/ijerph15030415>
- Berrones-Sanz, L. D., (2018). The working conditions of motorcycle taxi drivers in Tláhuac, Mexico City. *Journal of Transport Health*, 8, 73–80. <https://doi.org/10.1016/j.jth.2017.04.008>.
- Besharati, M. M., & Tavakoli Kashani, A. (2018). Factors contributing to intercity commercial bus drivers' crash involvement risk. *Archives of Environmental and Occupational Health*, 73(4), 243–250. <https://doi.org/10.1080/19338244.2017.1306478>
- Biron, C., Parent-Lamarche, A., Ivers, H., & Baril-Gingras, G. (2018). Do as you say: The effects of psychosocial safety climate on managerial quality in an organizational health intervention. *International Journal of Workplace Health Management*, 11(4), 228-244. <http://doi.org/10.1108/ijwhm-01-2018-0009>
- Blankson, P. K., & Lartey, M. (2020). Road traffic accidents in Ghana: Contributing factors and economic consequences. *Ghana Medical Journal*, 54(3), 131-139. <https://doi.org/10.4314/gmj.v54i3.1>

- Blankson, P. K., Amoako, J. K. A., Ansah-Opoku, K., Odei-Ansong, F., & Lartey, M. Y. (2019). Epidemiology of injuries presenting to the accident centre of Korle-Bu Teaching Hospital, Ghana. *BMC Emergency Medicine*, *19*(1), 1-6. <https://doi.org/10.1186/s12873-019-0252-3>
- Blankson, P. K., Nonvignon, J., Aryeetey, G., & Aikins, M. (2020). Injuries and their related household costs in a tertiary hospital in Ghana. *African Journal of Emergency Medicine*, *10*, S44–S49.
- Boateng, F. G. (2020). “Indiscipline” in context: A political-economic grounding for dangerous driving behaviors among Tro-Tro drivers in Ghana. *Humanities and Social Sciences Communications*, *7*(1), 1–5. <https://doi.org/10.1057/s41599-020-0502-8>
- Boateng, F. G. (2021). Why Africa cannot prosecute (or even educate) its way out of road accidents: Insights from Ghana. *Humanities and Social Sciences Communications*, *8*(1), 1-11. <https://doi.org/10.1057/s41599-020-00695-5>
- Bonsu, W. S., Adei, D., & Agyemang-Duah, W. (2020). Exposure to occupational hazards among bakers and their coping mechanisms in Ghana. *Cogent Medicine*, *7*(1), 1-19. <https://doi.org/10.1080/2331205x.2020.1825172>
- Bowen, L., Budden, S. L., & Smith, A. P. (2020). Factors underpinning unsafe driving: A systematic literature review of car drivers. *Transportation Research Part F: Traffic Psychology and Behaviour*, *72*, 184–210. <https://doi.org/10.1016/j.trf.2020.04.008>

- Brauchli, R., Jenny, G. J., Füllemann, D., & Bauer, G. F. (2015). Towards a Job Demands-Resources Health Model: Empirical testing with generalizable indicators of job demands, job resources, and comprehensive health outcomes. *BioMed Research International*, 21, 1-12. <https://doi.org/10.1155/2015/959621>
- Brodie, A., Pavey, T., Newton, C., & Sendall, M. C. (2021). Australian bus drivers' modifiable and contextual risk factors for chronic disease: A workplace study. *Plos One*, 16(7), e0255225. <https://doi.org/10.1371/journal.pone.0255225>
- Bronkhorst, B. (2015). Behaving safely under pressure: The effects of job demands, resources, and safety climate on employee physical and psychosocial safety behavior. *Journal of Safety Research*, 55, 63–72. <https://doi.org/10.1016/J.JSR.2015.09.002>
- Bronkhorst, B., & Vermeeren, B. (2016). Safety climate, worker health and organisational health performance testing a physical, psychosocial and combined pathway. *International Journal of Workplace Health Management*, 9(3), 270–289. <https://doi.org/10.1108/ijwhm-12-2015-0081/full/pdf>
- Canadian Centre for Occupational Health and Safety. (2021a). *Incident investigation*. Retrieved October 20, 2021, from Incident Investigation website: <https://www.ccohs.ca/oshanswers/hsprograms/investig.html>
- Canadian Centre for Occupational Health and Safety. (2021b). *Hazard and Risk: OSH Answers*. Retrieved October 20, 2021, from Hazard and Risk: OSH Answers website: https://www.ccohs.ca/oshanswers/hsprograms/hazard_risk.html

- Cendales, B., Alonso, F., & Serge, A. (2017). Comparing job stress, burnout, health and traffic crashes of urban bus and BRT drivers. *American Journal of Applied Psychology*, 5(1), 25–32. <https://doi.org/10.12691/ajap-5-1-5>
- Cendales-Ayala, B., Useche, S. A., Gómez-Ortiz, V., & Bocarejo, J. P. (2017). Bus operators' responses to job strain: An experimental test of the job demand-control model. *Journal of Occupational Health Psychology*, 22(4), 518–527. <https://doi.org/10.1037/ocp0000040>
- Chen, C. F., & Hsu, Y. C. (2020). Taking a closer look at bus driver emotional exhaustion and well-being: Evidence from Taiwanese urban bus drivers. *Safety and Health at Work*, 11(3), 353–360. <https://doi.org/10.1016/j.shaw.2020.06.002>
- Chen, C., & Zhang, J. (2016). Exploring background risk factors for fatigue crashes involving truck drivers on regional roadway networks: A case control study in Jiangxi and Shaanxi, China. *Springer Plus*, 5(1), 1–12. <https://doi.org/10.1186/S40064-016-2261-y/figures/2>
- Chen, S., Kuhn, M., Prettner, K., & Bloom, D. E. (2019). The global macroeconomic burden of road injuries: Estimates and projections for 166 countries. *The Lancet Planetary Health*, 3(9), e390–e398. [https://doi.org/10.1016/S2542-5196\(19\)30170-6](https://doi.org/10.1016/S2542-5196(19)30170-6)
- Chung, H. F., Cooke, L., Fry, J., & Hung, I. H. (2015). Factors affecting knowledge sharing in the virtual organisation: Employees' sense of well-being as a mediating effect. *Computers in Human Behavior*, 44, 70–80. <https://doi.org/10.1016/j.chb.2014.11.040>
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Cox, T., & Griffiths, A. (2005). "The nature and measurement of work-related stress: Theory and practice," in *Evaluation of Human Work* (3rd ed.). London: CRS Press.

Creswell, J., & Creswell, J. (2018). *Research design: Qualitative, quantitative and mixed methods approaches* (5th ed.). Los Angeles, USA: SAGE Publication.

Crizzle, A. M., Bigelow, P., Adams, D., Gooderham, S., Myers, A. M., & Thiffault, P. (2017). Health and wellness of long-haul truck and bus drivers: A systematic literature review and directions for future research. *Journal of Transport & Health*, 7, 90-109. <https://doi.org/10.1016/j.jth.2017.05.359>.

Darvishmotevali, M., & Ali, F. (2020). Job insecurity, subjective well-being and job performance: The moderating role of psychological capital. *International Journal of Hospitality Management*, 87, 102462. <https://doi.org/10.1016/j.ijhm.2020.102462>

Dassanayake, T., Michie, P., Carter, G., & Jones, A. (2011). Effects of benzodiazepines, antidepressants and opioids on driving. *Drug Safety*, 34(2), 125-156. <https://doi.org/10.2165/11539050-000000000-00000>

Deme, D. (2019). Review on factors causes road traffic accident in Africa. *Journal of Architecture and Construction*, 2(3), 41-49.

Demerouti, E., Bakker, A., Nachreiner, F., & Schaufeli, W. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, 86(3), 499.

- Dicke, T., Stebner, F., Linninger, C., Kunter, M., & Leutner, D. (2018). A longitudinal study of teachers' occupational well-being: Applying the job demands-resources model. *Journal of Occupational Health Psychology*, 23(2), 262–277. <https://doi.org/10.1037/ocp0000070>
- Di-Marco, D., Arenas, A., Giorgi, G., Arcangeli, G., & Mucci, N. (2018). Be friendly, stay well: The effects of job resources on well-being in a discriminatory work environment. *Frontiers in Psychology*, 9, 413. <https://doi.org/10.3389/fpsyg.2018.00413/bibtex>
- Dodoo, J. E., & Al-Samarraie, H. (2021). A systematic review of factors leading to occupational injuries and fatalities. *Journal of Public Health*, 31, 99–113. <https://doi.org/10.1007/s10389-020-01427-4>
- Dollard, M. F., & Bakker, A. B. (2010). Psychosocial safety climate as a precursor to conducive work environments, psychological health problems, and employee engagement. *Journal of Occupational and Organisational Psychology*, 83(3), 579–599. <https://doi.org/10.1348/096317909x470690>
- Dollard, M. F., & McTernan, W. (2011). Psychosocial safety climate: A multilevel theory of work stress in the health and community service sector. *Epidemiology and Psychiatric Sciences*, 20(4), 287–293. <https://doi.org/10.1017/s2045796011000588>
- Dollard, M. F., Dormann, C., & Idris, M. A. (2019). Psychosocial safety climate: A new work stress theory and implications for method. In *Psychosocial Safety Climate* (pp. 3-30). Springer, Cham. <https://doi.org/10.1007/978-3-030-20319-1>

Dollard, M. F., Tuckey, M. R., & Dormann, C. (2012). Psychosocial safety climate moderates the job demand–resource interaction in predicting workgroup distress. *Accident Analysis & Prevention*, *45*, 694–704. <https://doi.org/10.1016/j.aap.2011.09.042>

Dotse, J., Nicolson, R., & Rowe, R. (2019). Behavioral influences on driver crash risks in Ghana: A qualitative study of commercial passenger drivers. *Traffic Injury Prevention*, *20*(2), 134–139. <https://doi.org/10.1080/15389588.2018.1556792>

Driscoll, T., Rushton, L., Hutchings, S. J., Straif, K., Steenland, K., Abate, D., & Lim, S. S. (2020). Global and regional burden of disease and injury in 2016 arising from occupational exposures: A systematic analysis for the Global Burden of Disease Study 2016. *Occupational and Environmental Medicine*, *77*, 133–141. <https://doi.org/10.1136/oemed-2019-106008>

European Agency for Safety and Health at Work. (2021). *Psychosocial risks and stress at work*. Retrieved October 20, 2021, from psychosocial risks and stress at work website: <https://osha.europa.eu/en/themes/psychosocial-risks-and-stress>

Fornell, C., & Larcker, D. F. (1981). Structural equation models with unobservable variables and measurement error: Algebra and statistics: *Journal of Marketing Research*, *18*(3), 382–388.

Fowler, F. (2014). *Survey research methods* (5th ed.). Los Angeles, USA: SAGE Publications.

- Friedman, L. S., Almberg, K. S., & Cohen, R. A. (2019). Injuries associated with long working hours among employees in the US mining industry: Risk factors and adverse outcomes. *Occupational and Environmental Medicine*, 76(6), 389–395. <https://doi.org/10.1136/oemed-2018-105558>
- Garbarino, S., Guglielmi, O., Sannita, W. G., Magnavita, N., & Lanteri, P. (2018). Sleep and mental health in truck drivers: Descriptive review of the current evidence and proposal of strategies for primary prevention. *International Journal of Environmental Research and Public Health*, 15(9), 1852. <https://doi.org/10.3390/ijerph15091852>
- Gardner, D. G. (2020). The importance of being resilient: Psychological well-being, job autonomy, and self-esteem of organisation managers. *Personality and Individual Differences*, 155, 109731. <https://doi.org/10.1016/j.paid.2019.109731>
- Gauche, C., Beer, L. T. de, & Brink, L. (2017). Managing employee well-being: A qualitative study exploring job and personal resources of at-risk employees. *SA Journal of Human Resource Management*, 15(0), 13. <https://doi.org/10.4102/sajhrm.v15i0.957>
- Ghana Statistical Service. (2015). *2015 Labour Force Report*. Accra, Ghana. Retrieved 22 January, from https://www2.statsghana.gov.gh/docfiles/publications/Labour_Force/LFS%20REPORT_fianl_21-3-17.pdf
- GhanaWeb. (2019, March 25). *Accidents: 46,284 killed between 1991 and 2018*. Retrieved October 17, 2021, from: <https://www.ghanaweb.com/GhanaHomePage/NewsArchive/Accidents-46-284-killed-between-1991-and-2018-732939>

- Gómez, M. A. L., Sabbath, E., Boden, L., Williams, J. A., Hopcia, K., Hashimoto, D., & Sorensen, G. (2019). Organizational and psychosocial working conditions and their relationship with mental health outcomes in patient-care workers. *Journal of Occupational and Environmental Medicine*, *61*(12), e480-e485. <https://doi.org/10.1097/JOM.0000000000001736>
- Gómez-Ortiz, V., Cendales, B., Useche, S., & Bocarejo, J. P. (2018). Relationships of working conditions, health problems and vehicle accidents in bus rapid transit (BRT) drivers. *American Journal of Industrial Medicine*, *61*(4), 336–343. <https://doi.org/10.1002/ajim.22821>
- Guest, A. J., Chen, Y. L., Pearson, N., King, J. A., Paine, N. J., & Clemes, S. A. (2020). Cardiometabolic risk factors and mental health status among truck drivers: A systematic review. *BMJ Open*, *10*(10) e038993. <https://doi.org/10.1136/bmjopen-2020-038993>
- Guo, M., Liu, S., Chu, F., Ye, L., & Zhang, Q. (2019). Supervisory and coworker support for safety: Buffers between job insecurity and safety performance of high-speed railway drivers in China. *Safety Science*, *117*, 290–298. <https://doi.org/10.1016/J.ssci.2019.04.017>
- Gyimah, N. (2020). Contributing factors to road accidents in Ghana. *Mathews Journal of Emergency Medicine*, *8*(1), 1-14. <https://doi.org/10.2139/ssrn.3588627>
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the design of work: Test of a theory. *Organisational Behavior and Human Performance*, *16*(2), 250–279. [https://doi.org/10.1016/0030-5073\(76\)90016-7](https://doi.org/10.1016/0030-5073(76)90016-7)

- Hafeez, H., Abdullah, M. I., Riaz, A., & Shafique, I. (2020). Prevention of occupational injuries and accidents: A social capital perspective. *Nursing Inquiry*, 27(4), e12354. <https://doi.org/10.1111/nin.12354>
- Hair J. F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of Business Research*, 109, 101-110. <https://doi.org/10.1016/j.jbusres.2019.11.069>
- Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook* (p. 197). Springer Nature. <https://doi.org/10.1007/978-3-030-80519-7>
- Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research. *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/eb-10-2013-0128/full/pdf>
- Hall, G. B., Dollard, M. F., Coward, J., Dollard, M. F., Winefield, A. H., LaMontagne, A. D., & Mustard, C. (2010). Psychosocial safety climate: Development of the PSC-12. *Association*, 17(4), 353–383. <https://doi.org/10.1037/a0021320>
- Hall, G. B., Dollard, M. F., Winefield, A. H., Dormann, C., & Bakker, A. B. (2013). Psychosocial safety climate buffers effects of job demands on depression and positive organisational behaviors. *Anxiety, Stress and Coping*, 26(4), 355–377. <https://doi.org/10.1080/10615806.2012.700477>

- Hall, L. H., Johnson, J., Watt, I., Tsipa, A., & O'Connor, D. B. (2016). Healthcare staff wellbeing, burnout, and patient safety: A systematic review. *PloS One*, *11*(7), e0159015. <https://doi.org/10.1371/journal.pone.0159015>
- Hämäläinen, P., Takala, J., & Kiat, T. B. (2017). Global estimates of occupational accidents and work-related illnesses 2017. *World*, 3-4.
- Haslam, D., Filus, A., Morawska, A., Sanders, M. R., & Fletcher, R. (2015). The Work-Family Conflict Scale (WAFCS): Development and initial validation of a self-report measure of work-family conflict for use with parents. *Child Psychiatry and Human Development*, *46*(3), 346–357. <https://doi.org/10.1007/s10578-014-0476-0>
- Heffernan, M., & Dundon, T. (2016). Cross-level effects of high-performance work systems (HPWS) and employee well-being: The mediating effect of organisational justice. *Human Resource Management Journal*, *26*(2), 211–231. <https://doi.org/10.1111/1748-8583.12095>
- Hege, A., Lemke, M. K., Apostolopoulos, Y., & Sönmez, S. (2018). Occupational health disparities among U.S. Long-haul truck drivers: The influence of work organisation and sleep on cardiovascular and metabolic disease risk. *PLoS One*, *13*(11), e0207322. <https://doi.org/10.1371/journal.pone.0207322>
- Hege, A., Lemke, M. K., Apostolopoulos, Y., Whitaker, B., & Sönmez, S. (2019). Work-life conflict among us long-haul truck drivers: Influences of work organisation, perceived job stress, sleep, and organisational support. *International Journal of Environmental Research and Public Health*, *16*(6), 984. <https://doi.org/10.3390/ijerph16060984>

- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*(1), 115-135.
- Hindman, A. H., & Bustamante, A. S. (2019). Teacher depression as a dynamic variable: Exploring the nature and predictors of change over the head start year. *Journal of Applied Developmental Psychology*, *61*, 43–55. <https://doi.org/10.1016/j.appdev.2018.09.004>
- Huppert, F. A. (2009). Psychological well-being: Evidence regarding its causes and consequences. *Applied Psychology: Health and Well-Being*, *1*(2), 137–164. <https://doi.org/10.1111/j.1758-0854.2009.01008.x>
- Iavicoli, S., Cesana, G., Dollard, M., Leka, S., & Sauter, S. L. (2015). Psychosocial factors and workers' health and safety. *BioMed Research International*, *49*, 1-3. <https://doi.org/10.1155/2015/628749>
- Ibrahim, R. Z. A. R., Zalam, W. Z. M., Foster, B., Afrizal, T., Johansyah, M. D., Saputra, J., & Ali, S. N. M. (2021). Psychosocial work environment and teachers' psychological well-being: The moderating role of job control and social support. *International Journal of Environmental Research and Public Health*, *18*(14), 7308. <https://doi.org/10.3390/ijerph18147308>
- ILO. (2019a). *Safety and Health at the heart of future of work: Building on 100 years of experience*. Geneva, Switzerland. Retrieved October 19, 2021 from: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_686645.pdf

- ILO. (2019b). *Guidelines on the promotion of decent work and road safety in the transport sector I Meeting of Experts to Adopt Guidelines on the Promotion of Decent Work and Road Safety in the Transport Sector*. Retrieved October 19, 2021 from https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/--sector/documents/meetingdocument/wcms_716127.pdf
- ILO. (2020). *Guidelines on the promotion of decent work and road safety in the transport sector*. Retrieved October 19, 2021 from: https://www.ilo.org/sector/activities/sectoralmeetings/WCMS_742633/lang--en/index.htm
- Ingram, C., Downey, V., Roe, M., Chen, Y., Archibald, M., Kallas, K. A., & Perrotta, C. (2021). COVID-19 Prevention and control measures in workplace settings: A rapid review and meta-analysis. *International Journal of Environmental Research and Public Health*, 18(15), 7847. <https://doi.org/10.3390/ijerph18157847>
- IOHA. (2021). *Occupational hygiene*. Retrieved November 15, 2021, from Occupational Hygiene website: <https://www.ioha.net/about/occupational-hygiene/>
- Jilcha, K., & Kitaw, D. (2017). Industrial occupational safety and health innovation for sustainable development. *Engineering Science and Technology, an International Journal*, 20(1), 372–380. <https://doi.org/10.1016/j.jestch.2016.10.011>
- Johnson, O. (2020). Health-seeking behaviour of commercial bus drivers in Uyo, Nigeria. *Port Harcourt Medical Journal*, 14(3), 147-153. https://doi.org/10.4103/phmj.phmj_20_20

- Joseph, L., Vasanthan, L., Standen, M., Kuisma, R., Paungmali, A., Pirunsan, U., & Silitertpisan, P. (2021). Causal relationship between the risk factors and work-related musculoskeletal disorders among professional drivers: A systematic review. *Human Factors*, 00187208211006500. <https://doi.org/10.1177/00187208211006500>
- Juvani, A., Oksanen, T., Virtanen, M., Salo, P., Pentti, J., Kivimäki, M., & Vahtera, J. (2018). Clustering of job strain, effort–reward imbalance, and organisational injustice and the risk of work disability. *Scandinavian Journal of Work*, 44(5), 485–495. <https://doi.org/10.2307/26567032>
- Kanten, P., Durmaz, M. G., Kaya, E. B., Akkoyun, Y., & Kanten, S. (2019). The role of job demands and job resources model on job related strain and safety behaviors: A research on blue-collar workers. *Pressacademia*, 9(9), 29–35. <https://doi.org/10.17261/pressacademia.2019.1060>
- Karamali, F., Akbari, H., Saberi, H., Dehdashti, A., Ziloochi, M., Behzadi, M., & Kashani, M. (2020). Dangerous driving behaviors among professional drivers of Kashan. *International Archives of Health Sciences*, 7(4), 215-220. https://doi.org/10.4103/iahs.iahs_74_19
- Karasek, R., Brisson, C., Kawakami, N., Houtman, I., Bongers, P., & Amick, B. (1998). The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology*, 3(4), 322-355. <https://doi.org/10.1037/1076-8998.3.4.322>
- Kenny, D. A. (2018). *Moderation*. Retrieved on March 12, 2020 from <http://davidakenny.net/cm/moderation.htm>

- Kivimäki, M., Virtanen, M., Kawachi, I., Nyberg, S. T., Alfredsson, L., Batty, G. D... & Jokela, M. (2015). Long working hours, socioeconomic status, and the risk of incident type 2 diabetes: A meta-analysis of published and unpublished data from 222,120 individuals. *The Lancet Diabetes and Endocrinology*, 3(1), 27–34. [https://doi.org/10.1016/S2213-8587\(14\)70178-0](https://doi.org/10.1016/S2213-8587(14)70178-0)
- Kufuor, K. O. (2012). The struggle for entry into Ghana's commercial transport sector. *Global Journal of Comparative Law*, 1(1), 102-123. <https://doi.org/10.1163/2211906X-00101004>
- LaDou, J., London, L., & Watterson, A. (2018). Occupational health: A world of false promises. *Environmental Health*, 17(1), 1-8. <https://doi.org/10.1186/s12940-018-0422-x>
- LaMontagne, A. D., Milner, A., Krnjacki, L., Schlichthorst, M., Kavanagh, A., Page, K., & Pirkis, J. (2016). Psychosocial job quality, mental health, and subjective wellbeing: A cross-sectional analysis of the baseline wave of the Australian Longitudinal Study on Male Health. *BMC Public Health*, 16, 33–41. <https://doi.org/10.1186/s12889-016-3701-x>
- Law, R., Dollard, M. F., Tuckey, M. R., & Dormann, C. (2011). Psychosocial safety climate as a lead indicator of workplace bullying and harassment, job resources, psychological health and employee engagement. *Accident Analysis & Prevention*, 43(5), 1782–1793. <https://doi.org/10.1016/J.AAP.2011.04.010>

- Lawrie, E. J., Tuckey, M. R., & Dollard, M. F. (2018). Job design for mindful work: The boosting effect of psychosocial safety climate. *Journal of Occupational Health Psychology, 23*(4), 483–495. <https://doi.org/10.1037/OCP0000102>
- Lee, G. (2018). A systematic review of occupational health and safety business cases. *Workplace Health & Safety, 66*(2), 95–104. <https://doi.org/10.1177/2165079917730073>
- Lee, S., Kim, H. R., Byun, J., & Jang, T. (2017). Sleepiness while driving and shiftwork patterns among Korean bus drivers. *Annals of Occupational and Environmental Medicine, 29*(1), 1-8. <https://doi.org/10.1186/s40557-017-0203-y>
- Leitão, S., Mc Carthy, V. J. C., & Greiner, B. A. (2018). Health and safety practitioners' health and wellbeing — The link with safety climate and job demand-control-support. *Accident Analysis and Prevention, 119*, 131–137. <https://doi.org/10.1016/j.aap.2018.06.017>
- Lesener, T., Gusy, B., & Wolter, C. (2019). The job demands-resources model: A meta-analytic review of longitudinal studies. *Work and Stress, 33*(1), 76–103. <https://doi.org/10.1080/02678373.2018.1529065>
- Li, F., Wang, G., Li, Y., & Zhou, R. (2017). Job demands and driving anger: The roles of emotional exhaustion and work engagement. *Accident Analysis and Prevention, 98*, 198–205. <https://doi.org/10.1016/j.aap.2016.10.013>

- Llamazares, J., Useche, S. A., Montoro, L., & Alonso, F. (2021). Commuting accidents of Spanish professional drivers: When occupational risk exceeds the workplace. *International Journal of Occupational Safety and Ergonomics*, 27(3), 754–762. <https://doi.org/10.1080/10803548.2019.1619993>
- Loepke, R. R., Hohn, T., Baase, C., Bunn, W. B., Burton, W. N., Eisenberg, B. S & ... Siuba, J. (2015). Integrating health and safety in the workplace. *Journal of Occupational and Environmental Medicine*, 57(5), 585–597. <https://doi.org/10.2307/48501280>
- Loh, M. Y., Idris, M. A., Dollard, M. F., & Isahak, M. (2018). Psychosocial safety climate as a moderator of the moderators: Contextualizing JDR models and emotional demands effects. *Journal of Occupational and Organisational Psychology*, 91(3), 620–644. <https://doi.org/10.1111/joop.12211>
- Longman, D. P., Shaw, C. N., Varela-Mato, V., Sherry, A. P., Ruettger, K., Sayyah, M., & Clemes, S. A. (2021). Time in nature associated with decreased fatigue in UK truck drivers. *International Journal of Environmental Research and Public Health*, 18(6), 1–17. <https://doi.org/10.3390/ijerph18063158>
- Lopez-Martin, E., & Topa, G. (2019). Organisational culture and job demands and resources: Their impact on employees' wellbeing in a multivariate multilevel model. *International Journal of Environmental Research and Public Health*, 16(17), 3006. <https://doi.org/10.3390/ijerph16173006>

- Lucchini, R. G., & London, L. (2014). Global occupational health: Current challenges and the need for urgent action. *Annals of Global Health*, 80(4), 251-256. <https://doi.org/10.1016/j.aogh.2014.09.006>
- Luchman, J. N., & González-Morales, M. G. (2013). Demands, control, and support: A meta-analytic review of work characteristics interrelationships. *Journal of Occupational Health Psychology*, 18(1), 37–52. <https://doi.org/10.1037/A0030541>
- Lund, F., Alferts, L., & Santana, V. (2016). Towards an inclusive occupational health and safety for informal workers. *New Solutions*, 26(2), 190–207. <https://doi.org/10.1177/1048291116652177>
- Madsen, I. E., & Rugulies, R. (2021). Understanding the impact of psychosocial working conditions on workers' health: We have come a long way, but are we there yet? *Scandinavian Journal of Work, Environment & Health*, 47(7), 483–487. <https://doi.org/10.5271/sjweh.3984>
- Mahudin, N. D. M., & Sakiman, M. N. (2020). Overworked and unsafe: A comparison of driving behaviour and safety culture according to driver types and working hours. *International Journal of Road Safety*, 1(2), 42-48.
- Mansour, S. (2022). Psychosocial Safety Climate (PSC). In *Handbook on Management and Employment Practices* (pp. 459-479). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-29010-8_21
- Mansour, S., & Tremblay, D. G. (2018). Psychosocial safety climate as resource passageways to alleviate work-family conflict: A study in the health sector in Quebec. *Personnel Review*, 47(2), 474-493. <https://doi.org/10.1108/PR-10-2016-0281>

- Mehdizadeh, M., Shariat-Mohaymany, A., & Nordfjaern, T. (2018). Accident involvement among Iranian lorry drivers: Direct and indirect effects of background variables and aberrant driving behaviour. *Traffic Psychology and Behaviour*, 58, 39-55. <https://doi.org/10.1016/j.trf.2018.05.029>
- Mertler, C. A., Vannatta, R. A., & LaVenía, K. N. (2021). *Advanced and Multivariate Statistical Methods: Practical Application and Interpretation* (7th ed.). Routledge. <https://doi.org/10.4324/9781003047223>
- Mills, G. E., & Gay, L. R. (2019). *Educational research: Competencies for analysis and applications*. In Pearson (12th ed.). New Jersey: Pearson.
- Milner, A., Krnjacki, L., & LaMontagne, A. D. (2017). Psychosocial job quality and mental health among young workers: A fixed-effects regression analysis using 13 waves of annual data. *Scandinavian Journal of Work, Environment and Health*, 43(1), 50–58. <https://doi.org/10.5271/sjweh.3608>
- Min, J., Kim, Y., Lee, S., Jang, T. W., Kim, I., & Song, J. (2019). The fourth industrial revolution and its impact on occupational health and safety, worker's compensation and labor conditions. *Safety and Health at Work*, 10(4), 400-408. <https://doi.org/10.1016/j.shaw.2019.09.005>
- Ministry of Transport. (2022). *Ghana Drivers' Guide*. Retrieved on November 9, 2022 from: https://mrh.gov.gh/wp-content/uploads/2022/09/Ghana-Drivers-Guide-_Final_Signed.pdf
- Molina-Hernández, J., Fernández-Estevan, L., Montero, J., & González-García, L. (2021). Work environment, job satisfaction and burnout among Spanish dentists: A cross-sectional study. *BMC Oral Health*, 21(1). <https://doi.org/10.1186/s12903-021-01480-9>

- Monney, I., Dramani, J. B., Aruna, A., Tenkorang, A. G., & Osei-Poku, F. (2015). Health and safety in high-risk work environments: A study of fuel service stations in Ghana. *Journal of Environmental and Occupational Health, 4*(3), 132-140. <https://doi.org/10.5455/jeos.20150903100137>
- Montoro, L., Useche, S., Alonso, F., & Cendales, B. (2018). Work environment, stress, and driving anger: A structural equation model for predicting traffic sanctions of public transport drivers. *International Journal of Environmental Research and Public Health, 15*(3), 497. <https://doi.org/10.3390/ijerph15030497>
- Mudrak, J., Zabrodská, K., Kveton, P., Jelinek, M., Blatny, M., Solcova, I., & Machovcova, K. (2018). Occupational well-being among University Faculty: A Job Demands-Resources Model. *Research in Higher Education, 59*(3), 325–348. <https://doi.org/10.1007/s11162-017-9467-x>
- Nævestad, T. O., Phillips, R. O., Laiou, A., Bjørnskau, T., & Yannis, G. (2019). Safety culture among bus drivers in Norway and Greece. *Transportation Research Part F: Traffic Psychology and Behaviour, 64*, 323–341. <https://doi.org/10.1016/j.trf.2019.05.006>
- Nakua, E. K., Owusu-Dabo, E., Newton, S., Adofo, K., Otupiri, E., Donkor, P., & Mock, C. (2019). Occupational injury burden among gold miners in Ghana. *International Journal of Injury Control and Safety Promotion, 26*(4), 329–335. <https://doi.org/10.1080/17457300.2018.1515232>
- Nguyen, D. T. N., Teo, S. T. T., Grover, S. L., & Nguyen, N. P. (2017). Psychological safety climate and workplace bullying in Vietnam's public sector. *Public Management Review, 19*(10), 1415–1436. <https://doi.org/10.1080/14719037.2016.1272712>

- Nguyen-Phuoc, D. Q., Nguyen, H. A., De Gruyter, C., Su, D. N., & Nguyen, V. H. (2019). Exploring the prevalence and factors associated with self-reported traffic crashes among app-based motorcycle taxis in Vietnam. *Transport Policy*, *81*, 68-74. <https://doi.org/10.1016/j.tranpol.2019.06.006>
- Niedhammer, I., Bertrais, S., & Witt, K. (2021). Psychosocial work exposures and health outcomes: A meta-review of 72 literature reviews with meta-analysis. *Scandinavian Journal of Work, Environment & Health*, *47*(7), 489–508. <https://doi.org/10.5271/sjweh.3968>
- Nielsen, K., Nielsen, M. B., Ogbonnaya, C., Känslä, M., Saari, E., & Isaksson, K. (2017). Workplace resources to improve both employee well-being and performance: A systematic review and meta-analysis. *Work & Stress*, *31*(2), 101–120. <https://doi.org/10.1080/02678373.2017.1304463>
- Nigatu, Y. T., & Wang, J. L. (2018). The combined effects of job demand and control, effort-reward imbalance and work-family conflicts on the risk of major depressive episode: A 4-year longitudinal study. *Occupational and Environmental Medicine*, *75*(1), 6–11. <https://doi.org/10.1136/oemed-2016-104114>
- Nilsson, M., Griggs, D., McCollum, D., & Stevance, A. (2018). *A guide to SDG interactions: From science to implementation*. International Council for Science, Paris, France. <https://doi.org/10.24948/2017.01>
- Notelaers, G., Törnroos, M., & Salin, D. (2019). Effort-reward imbalance: A risk factor for exposure to workplace bullying. *Frontiers in Psychology*, *10*, 386. <https://doi.org/10.3389/fpsyg.2019.00386>

- Nsiah-Asamoah, C. N. A., & Buxton, D. N. B. (2021). Hydration and water intake practices of commercial long-distance drivers in Ghana: What do they know and why does it matter? *Heliyon*, 7(3), e06512. <https://doi.org/10.1016/J.heliyon.2021.E06512>
- O'Brien, K. R., McAbee, S. T., Hebl, M. R., & Rodgers, J. R. (2016). The impact of interpersonal discrimination and stress on health and performance for early career STEM academicians. *Frontiers in Psychology*, 7, 615. <https://doi.org/10.3389/FPSYG.2016.00615/bibtex>
- Obrenovic, B., Jianguo, D., Khudaykulov, A., & Khan, M. A. S. (2020). Work-family conflict impact on psychological safety and psychological well-being: A job performance model. *Frontiers in Psychology*, 11, 475 <https://doi.org/10.3389/fpsyg.2020.00475>
- OECD. (2021). *Injuries in road traffic accidents*. Retrieved October 25, 2021 from <https://stats.oecd.org/FileView2.aspx?IDFile=2057d8ba-4e8b-4adf-b65b-7f4be8fac837>
- Ojo, T., Agyemang, W., & Afukaar, F. (2018). Lived experiences of inter-urban commercial bus drivers involved in road traffic crashes in Central Region, Ghana. *Urban, Planning and Transport Research*, 6(1), 81–94. <https://doi.org/10.1080/21650020.2018.1545601>
- Oppong, S. (2014). Common health, safety and environmental concerns in upstream oil and gas sector: Implications for HSE management in Ghana. *Academicus International Scientific Journal*, 9, 93–106.

- Ossei, P. P. S., Agagli, B. M., Ayibor, W. G., Niako, N., & Asante, E. (2019). Trend analysis and economic effect of RTA deaths on dependency ratio in Ghana. *Journal of Economics and International Finance*, *11*(7), 85–90. <https://doi.org/10.5897/jeif2019.0997>
- Ossei, P.P.S., Agyeman-Duah, E., Ayibor, W. G., Niako, N., & Safo, K. F. (2021). Latent medical conditions of drivers involved in road traffic collisions in Ghana: Implication from autopsy findings: *Clinical Pathology*, *14*, 1–8. <https://doi.org/10.1177/2632010x2111043871>
- Peng, Z., Zhang, H., & Wang, Y. (2020). Work-related factors, fatigue, risky behaviours and traffic accidents among taxi drivers: A comparative analysis among age groups. *International Journal of Injury Control and Safety Promotion*, *28*(1), 58-67. <https://doi.org/10.1080/17457300.2020.1837885>
- Peters, S. E., Grogan, H., Henderson, G. M., López Gómez, M. A., Martínez-Maldonado, M., & Dennerlein, J. T. (2021). Working conditions influencing drivers' safety and well-being in the transportation industry: “On Board” Program. *International Journal of Environmental Research and Public Health*, *18*(19), 10173. <https://doi.org/10.3390/ijerph181910173>
- Platania, S., Morando, M., Caruso, A., & Scuderi, V. E. (2022). The effect of psychosocial safety climate on engagement and psychological distress: A multilevel study on the healthcare sector. *Safety*, *8*(3), 62. <https://doi.org/10.3390/safety8030062>
- Ponsonby, W. (2017). Global occupational health. *Occupational Medicine*, *67*, 331–333. <https://doi.org/10.1093/occmed/kqx068>

Puplampu, B. B., & Quartey, S. H. (2012). Key issues on occupational health and safety practices in Ghana: A review. *International Journal of Business and Social Science*, 3(19), 151-156.

Quartey, S. H., & Puplampu, B. B. (2012). Employee health and safety practices: An exploratory and comparative study of the shipping and manufacturing industries in Ghana. *International Journal of Business and Management*, 7(23), 81-95. <https://doi.org/10.5539/ijbm.v7n23p81>

Rantanen, J., Muchiri, F., & Lehtinen, S. (2020). Decent work, ILO's response to the globalization of working life: Basic concepts and global implementation with special reference to occupational health. *International Journal of Environmental Research and Public Health*, 17(10), 3351. <https://doi.org/10.3390/ijerph17103351>

Rasool, S. F., Wang, M., Tang, M., Saeed, A., & Iqbal, J. (2021). How toxic workplace environment effects the employee engagement: The mediating role of organisational support and employee wellbeing. *International Journal of Environmental Research and Public Health*, 18(5), 1–17. <https://doi.org/10.3390/ijerph18052294>

Reason, J., Manstead, A., Stradling, S., Baxter, J., & Campbell, K. (2011). Errors and violations on the roads: A real distinction? *Ergonomics*, 33(10), 1315–1332. <https://doi.org/10.1080/00140139008925335>

Reese, C. D. (2017). Occupational safety and health: Fundamental principles and philosophies. In *Occupational Safety and Health: Fundamental Principles and Philosophies* (1st ed.). New York: CRC Press.

- Reese, C. D. (2018). Occupational health and safety management: A practical approach (3rd ed.). In *Occupational Health and Safety Management* (3rd ed.). CRC Press. <https://doi.org/10.1201/9781351228848>
- Ringle, C. M., Sarstedt, M., & Straub, D. W. (2012). A critical look at the use of PLS-SEM in MIS quarterly. *MIS Quarterly: Management Information Systems*, 36(1). <https://doi.org/10.2307/41410402>
- Romero, J. M. O. J., Reiman, A., Delgado, J. J. C., Väyrynen, S., Pekkala, J., & Forsman, M. (2018). Delivery truck drivers' work outside the cab: Psychosocial discomforts and risks based on participatory video analyses. *European Transport Research Review*, 10(2), 1-11. <https://doi.org/10.1186/S12544-018-0299-3/tables/4>
- Rout, B. K., & Sikdar, B. K. (2017). Hazard identification, risk assessment, and control measures as an effective tool of occupational health assessment of hazardous process in an Iron Ore Pelletizing Industry. *Indian Journal of Occupational and Environmental Medicine*, 21(2), 56-57. https://doi.org/10.4103/ijoem.ijoem_19_16
- Rushton, L. (2017). The global burden of occupational disease. *Current Environmental Health Reports*, 4(3), 340-348. <https://doi.org/10.1007/s40572-017-0151-2>
- Safe Work Australia. (2015). *Key work health and safety statistics*. Retrieved 21 June 2021 from: <https://www.safeworkaustralia.gov.au/system/files/documents/1702/key-whs-stat-2015.pdf>

- Salaudeen, A. G., Durowade, K. A., Yusuf, A. S., & Adeyemi, M. F. (2019). Practice of safety measures among inter-city commercial vehicle drivers in Kwara State, Nigeria. *Journal of Preventive Medicine and Hygiene*, 60(2), E158–E162. <https://doi.org/10.15167/24214248/jpmh2019.60.2.991>
- Sam, E. F., Daniels, S., Brijs, K., Brijs, T., & Wets, G. (2018). Modelling public bus/minibus transport accident severity in Ghana. *Accident Analysis and Prevention*, 119, 114–121. <https://doi.org/10.1016/j.aap.2018.07.008>
- Santos, J. A., & Lu, J. L. (2016). Occupational safety conditions of bus drivers in Metro Manila, the Philippines. *International Journal of Occupational Safety and Ergonomics*, 22(4), 508-513. <https://doi.org/10.1080/10803548.2016.1151700>
- Schaufeli, W. B. (2017). Applying the Job Demands-Resources model: A ‘how to’ guide to measuring and tackling work engagement and burnout. *Organisational Dynamics*, 46(2), 120–132. <https://doi.org/10.1016/j.orgdyn.2017.04.008>
- Schaufeli, W. B., & Taris, T. W. (2014). A critical review of the job demands-resources model: Implications for improving work and health. *Bridging Occupational, Organisational and Public Health*, 24, 43-68. https://doi.org/10.1007/978-94-007-5640-3_4
- Sekkay, F., Imbeau, D., Dubé, P. A., Chinniah, Y., de Marcellis-Warin, N., Beauregard, N., & Trépanier, M. (2021). Assessment of physical work demands of long-distance industrial gas delivery truck drivers. *Applied Ergonomics*, 90, 103224. <https://doi.org/10.1016/j.apergo.2020.103224>

Shukri, M., Jones, F., & Conner, M. (2021). Work–family conflict and dangerous driving behaviours: The mediating role of affect. *Stress and Health*, 37(4), 669-681. <https://doi.org/10.1002/smi.3026>

Simpeh, F., & Amoah, C. (2021). COVID-19 guidelines incorporated in the health and safety management policies of construction firms. *Journal of Engineering, Design and Technology*, 20(1), 6-23. <https://doi.org/10.1108/jedt-01-2021-0042>

Skaalvik, E. M., & Skaalvik, S. (2018). Job demands and job resources as predictors of teacher motivation and well-being. *Social Psychology of Education*, 21(5), 1251–1275. <https://doi.org/10.1007/s11218-018-9464-8>

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290-312). Washington DC: American Sociological Association.

Sorensen, G., Dennerlein, J. T., Peters, S. E., Sabbath, E. L., Kelly, E. L., & Wagner, G. R. (2021). The future of research on work, safety, health and wellbeing: A guiding conceptual framework. *Social Science and Medicine*, 269, 113593. <https://doi.org/10.1016/j.socscimed.2020.113593>

Sorensen, G., Sparer, E., Williams, J. A. R., Gundersen, D., Boden, L. I., Dennerlein, J. T... & Wagner, G. R. (2018). Measuring best practices for workplace safety, health, and well-being: The Workplace Integrated Safety and Health Assessment. *Journal of Occupational and Environmental Medicine*, 60(5), 430–439. <https://doi.org/10.1097/jom.0000000000001286>

Statista. (2021). *Global gross domestic product (GDP) 2026*. Retrieved October 29, 2021 from <https://www.statista.com/statistics/268750/global-gross-domestic-product-gdp/>

Striffler, L., Barnsley, J. M., Hillmer, M., & Straus, S. E. (2020). Identifying and selecting implementation theories, models and frameworks: A qualitative study to inform the development of a decision support tool. *BMC Medical Informatics and Decision Making*, 20(1), 1–12. <https://doi.org/10.1186/S12911-020-01128-8/tables/5>

Su, L., & Swanson, S. R. (2019). Perceived corporate social responsibility's impact on the well-being and supportive green behaviors of hotel employees: The mediating role of the employee-corporate relationship. *Tourism Management*, 72, 437–450. <https://doi.org/10.1016/j.tourman.2019.01.009>

Tagoe, T., & Amponsah-Tawiah, K. (2019). Psychosocial hazards and work engagement in the Ghanaian banking sector: The moderating role of psychosocial safety climate. *International Journal of Bank Marketing*, 38(2), 310-331

Takala, J., Hämmäläinen, P., Nenonen, N., Takahashi, K., Chimed-ochir, O., & Rantanen, J. (2017). Comparative analysis of the burden of injury and illness at work in selected countries and regions. *Central European Journal of Occupational and Environmental Medicine*, 23, 6–31.

Takala, J., Hämmäläinen, P., Saarela, K. L., Yun, L. Y., Manickam, K., Jin, T. W., & Lin, G. S. (2014). Global estimates of the burden of injury and illness at work in 2012. *Journal of Occupational and Environmental Hygiene*, 11(5), 326–337. <https://doi.org/10.1080/15459624.2013.863131>

- Tàpia-Caballero, P., Serrano-Fernández, M. J., Boada-Cuerva, M., Sora, B., & Boada-Grau, J. (2022). Influence that job characteristics, personality and burnout have on fatigue in professional drivers. *International journal of occupational safety and ergonomics*, 28(3), 1331-1341. <https://doi.org/10.1080/10803548.2021.1888019>
- Teoh, K. B., & Kee, D. M. H. (2020). Psychosocial safety climate and burnout among academicians: The mediating role of work engagement. *International Journal of Society Systems Science*, 12(1), 1-14.
- Teye-Kwadjo, E. (2019). Risky driving behaviour in urban Ghana: The contributions of fatalistic beliefs, risk perception, and risk-taking attitude. *International Journal of Health Promotion and Education*, 57(5), 256–273.
- Topp, C. W., Østergaard, S. D., Søndergaard, S., & Bech, P. (2015). The WHO-5 Well-Being Index: A systematic review of the literature. *Psychotherapy and Psychosomatics*, 84(3), 167–176. <https://doi.org/10.1159/000376585>
- Tuan, L. T., Rowley, C., Khai, D. C., Qian, D., Masli, E., & Le, H. Q. (2020). Fostering well-being among public employees with disabilities: The roles of disability-inclusive human resource practices, job resources, and public service motivation: *Review of Public Personnel Administration* 41(3), 466–496. <https://doi.org/10.1177/0734371X19897753>

- Tziner, A., Rabenu, E., Radomski, R., & Belkin, A. (2015). Work stress and turnover intentions among hospital physicians: The mediating role of burnout and work satisfaction. *Revista de Psicología Del Trabajo y de Las Organizaciones*, 31(3), 207–213. <https://doi.org/10.1016/J.RPTO.2015.05.001>
- U.S Bureau of Labor Statistics. (2022). *Labour reviews*. Retrieved January 20, 2023 from <https://www.bls.gov/opub/mlr/2017/home.htm>
- Useche, S. A, Ortiz, V. G., & Cendales, B. E. (2017). Stress-related psychosocial factors at work, fatigue, and risky driving behavior in bus rapid transport (BRT) drivers. *Accident Analysis and Prevention*, 104, 106–114. <https://doi.org/10.1016/j.aap.2017.04.023>
- Useche, S. A., Alonso, F., Cendales, B., & Llamazares, J. (2021). More than just “stressful”? Testing the mediating role of fatigue on the relationship between job stress and occupational crashes of long-haul truck drivers. *Psychology Research and Behavior Management*, 14, 1211–1221. <https://doi.org/10.2147/prbm.S305687>
- Useche, S. A., Alonso, F., Cendales, B., Autukevi, R., & Serge, A. (2017). Burnout, occupational stress, health and road accidents among bus drivers: Barriers and challenges for prevention. *Journal of Environmental and Occupational Science*, 6(1), 1-7. <https://doi.org/10.5455/jeos.20170202074636>
- Useche, S. A., Cendales, B., Montoro, L., & Esteban, C. (2018). Work stress and health problems of professional drivers: A hazardous formula for their safety outcomes. *Peer J.*, 6., e6249. <https://doi.org/10.7717/peerj.6249>

- Useche, S. A., Gómez, V., Cendales, B., & Alonso, F. (2018). Working conditions, job strain, and traffic safety among three groups of public transport drivers. *Safety and Health at Work*, 9(4), 454–461. <https://doi.org/10.1016/j.shaw.2018.01.003>
- Useche, S. A., Montoro, L., Alonso, F., & Pastor, J. C. (2019). Psychosocial work factors, job stress and strain at the wheel: Validation of the Copenhagen Psychosocial Questionnaire (COPSOQ) in professional drivers. *Frontiers in Psychology*, 10, 1531. <https://doi.org/10.3389/fpsyg.2019.01531>
- Vahedi, J., Shariat-Mohaymany, A., Tabibi, Z., & Mehdizadeh, M. (2018). Aberrant driving behaviour, risk involvement, and their related factors among taxi drivers. *International Journal of Environmental Research and Public Health*, 15(8), 1626. <https://doi.org/10.3390/ijerph15081626>
- Vis soci, J. R. N., Shogilev, D. J., Krebs, E., Andrade, L. D., Vieira, I. F., Toomey, N... & Staton, C. A. (2017). Road traffic injury in sub-Saharan African countries: A systematic review and summary of observational studies. *Traffic Injury Prevention*, 18(7), 767-773.
- Wagstaff, A. S., & Lie, J. A. S. (2011). Shift and night work and long working hours-A systematic review of safety implications. *Scandinavian Journal of Work, Environment & Health*, 173-185. <https://doi.org/10.5271/sjweh.3146>
- Wang, L., & Pei, Y. (2014). The impact of continuous driving time and rest time on commercial drivers' driving performance and recovery. *Journal of Safety Research*, 50, 11-15. <https://doi.org/10.1016/j.jsr.2014.01.003>

WHO, & ILO. (2021). *WHO/ILO joint estimates of the work-related burden of disease and injury, 2000-2016: Global monitoring report*. Retrieved September 17, 2021, from <https://www.who.int/publications/i/item/9789240034945>

WHO. (1998). *Wellbeing measure in primary health care: The Depcare Project*. Retrieved September 17, 2021, from https://www.euro.who.int/data/assets/pdf_file/0016/130750/E60246.pdf

WHO. (2018). *Global Status Report on Road Safety 2018*. Retrieved September 18, 2021 from <http://apps.who.int/iris/bitstream/handle/10665/277370/WHO-NMH-NVI-18.20-eng.pdf?ua=1>

WHO. (2021a). *Road traffic injuries*. Retrieved September 17, 2021, from Road Traffic Injuries <https://www.who.int/news-room/fact-sheets/detail/road-traffic-injuries>

WHO. (2021b). *Occupational health*. Retrieved November 15, 2021, from Occupational Health <https://www.who.int/health-topics/occupational-health>

WHO. (2021c). *Road traffic deaths data by country*. Retrieved January 5, 2022, from Global Health Observatory data repository <https://apps.who.int/gho/data/node.main.A997?lang=en>

Wilton, A., McLinton, S., & Dollard, M. F. (2019). PSC, effort-reward imbalance and cognitive decline; A Road Safety Experiment. *Psychosocial Safety Climate*, 25, 109–128. https://doi.org/10.1007/978-3-030-20319-1_4

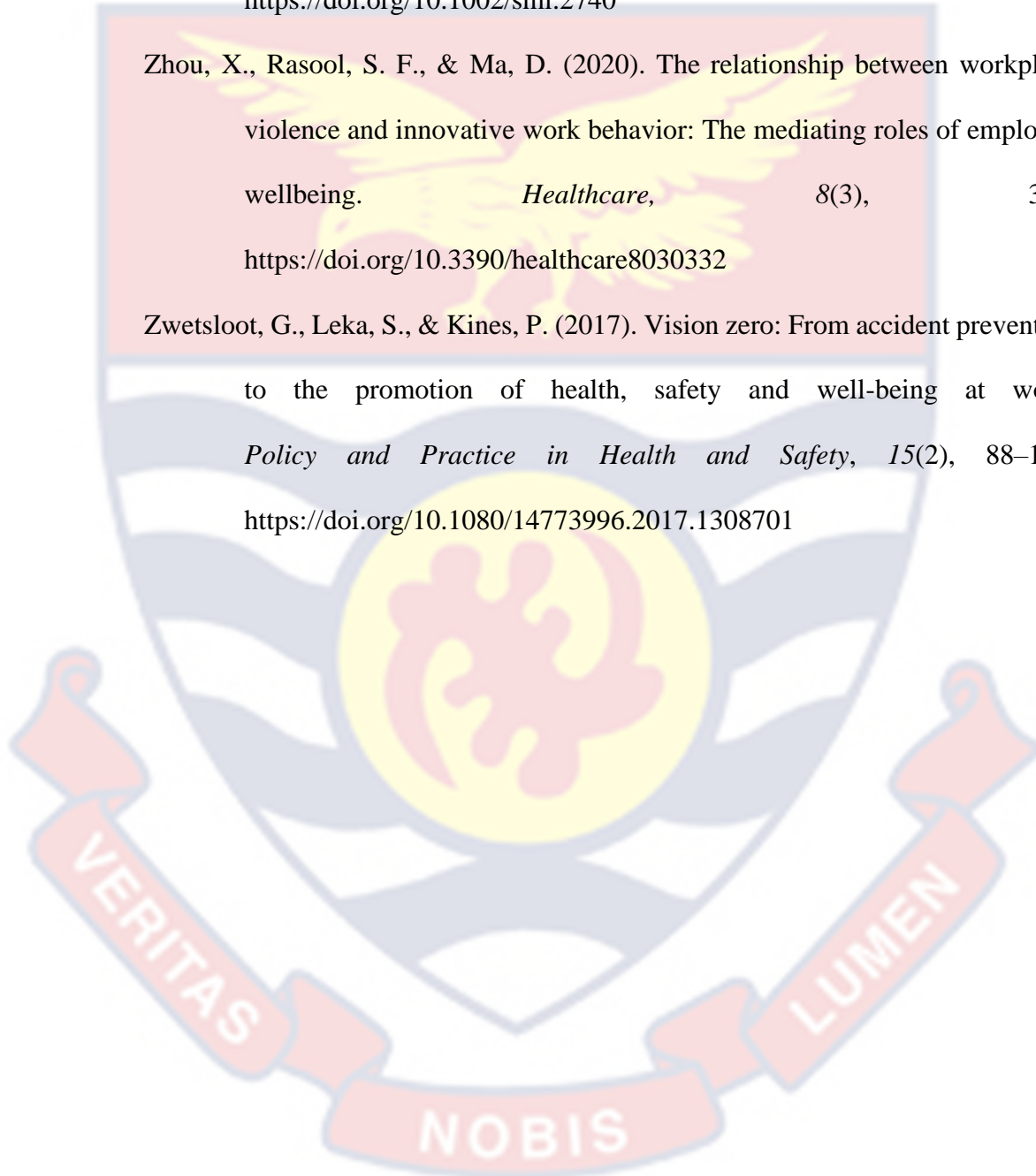
- Wolter, C., Santa-Maria, A., Wörfel, F., Gusy, B., Lesener, T., Kleiber, D., & Renneberg, B. (2019). Job demands, job resources, and well-being in Police Officers—A Resource-Oriented Approach. *Journal of Police and Criminal Psychology, 34*(1), 45–54. <https://doi.org/10.1007/s11896-018-9265-1>
- Wong, K., & Chan, A. H. S. (2018). Emerging issues in occupational safety and health. *International Journal of Environmental Research and Public Health, 15*(12), 2897. <https://doi.org/10.3390/ijerph15122897>
- Wood, J. (1991). International Labour Organisation Conventions—Labour Code or Treaties? *International & Comparative Law Quarterly, 40*(3), 649-657.
- Wright, Jr, K. P., Bogan, R. K., & Wyatt, J. K. (2013). Shift work and the assessment and management of shift work disorder (SWD). *Sleep Medicine Reviews, 17*(1), 41-54. <https://doi.org/10.1016/j.smrv.2012.02.002>
- Wu, X., Zhang, H., Xiao, W., Ning, P., Schwebel, D. C., & Hu, G. (2019). Are bus company regulations associated with crash risk? Findings from a retrospective survey in four Chinese cities. *International Journal of Environmental Research and Public Health, 16*(8), 1342. <https://doi.org/10.3390/ijerph16081342>
- Yaris, C., Ditchburn, G., Curtis, G. J., & Brook, L. (2020). Combining physical and psychosocial safety: A comprehensive workplace safety model. *Safety Science, 132*, 104949. <https://doi.org/10.1016/j.ssci.2020.104949>

- Yobo, E. (2013). *The politics of public transportation in Ghana: The case of Metro Mass Transit Limited*. Retrieved December 20, 2021 from http://ugspace.ucc.edu.gh/bitstream/handle/123456789/5284/Eric%20Yobo_Politics%20of%20Public%20Transportation%20in%20Ghana%20
- Yobo, E. (2014). Role of the state in Ghana's road transport system. *Research Journal of Public Policy*, 1(3), 1–13.
- Yulita, Y., Idris, M. A., & Dollard, M. F. (2014). A multi-level study of psychosocial safety climate, challenge and hindrance demands, employee exhaustion, engagement and physical health. *Psychosocial Factors at Work in the Asia Pacific*, 127–143. https://doi.org/10.1007/978-94-017-8975-2_6
- Yulita, Y., Idris, M. A., & Dollard, M. F. (2020). Effect of psychosocial safety climate on psychological distress via job resources, work engagement and workaholism: A multilevel longitudinal study. *International journal of Occupational Safety and Ergonomics*, 1-18. <https://doi.org/10.1080/10803548.2020.1822054>
- Yulita, Y., Idris, M. A., & Dollard, M. F. (2016) Psychosocial safety climate: Past, present, and future research. In: Shimazu A., Bin Nordin R., Dollard M., Oakman J. (eds) *Psychosocial Factors at Work in the Asia Pacific*. Springer, Cham. https://doi.org/10.1007/978-3-319-44400-0_6

Zadow, A. J., Dollard, M. F., Mclinton, S. S., Lawrence, P., & Tuckey, M. R. (2017). Psychosocial safety climate, emotional exhaustion, and work injuries in healthcare workplaces. *Stress and Health, 33*(5), 558–569. <https://doi.org/10.1002/smi.2740>

Zhou, X., Rasool, S. F., & Ma, D. (2020). The relationship between workplace violence and innovative work behavior: The mediating roles of employee wellbeing. *Healthcare, 8*(3), 332. <https://doi.org/10.3390/healthcare8030332>

Zwetsloot, G., Leka, S., & Kines, P. (2017). Vision zero: From accident prevention to the promotion of health, safety and well-being at work. *Policy and Practice in Health and Safety, 15*(2), 88–100. <https://doi.org/10.1080/14773996.2017.1308701>





APPENDICES

APPENDIX A: QUESTIONNAIRE FOR DRIVERS**UNIVERSITY OF CAPE COAST****COLLEGE OF EDUCATION STUDIES****DEPARTMENT OF HEALTH, PHYSICAL EDUCATION AND RECREATION****Dear Driver,**

I am Mustapha Amodu, a PhD candidate specialising in Health Promotion, Environmental, and Occupational Health at the Department of HPER, UCC. I am reaching out to invite you to take part in an important academic research study titled "Psychosocial Work Factors, Perceived Well-being, and Safety Incidents among Long-distance Commercial Drivers in Ghana." This study aims to investigate how working conditions impact the well-being and safety of long-distance drivers on the road. Your involvement will require you to complete a 57-item survey, which is estimated to take around 10 to 25 minutes of your time. It is essential to understand that you are a part of a larger group participating in this research, and your responses will be analysed collectively. Your contribution to this study plays a vital role in enhancing the well-being and safety of long-distance commercial drivers in the road transport industry. Please be assured that your identity will remain confidential, and your participation is entirely voluntary. You have the freedom to skip any question or discontinue your participation at any point during the survey. The survey will include questions about your past experiences with road traffic incidents. If you fully comprehend your responsibilities and are willing to participate in this survey, kindly provide your signature or thumbprint in the space provided below.

Signature/thumbprint..... Date.....

For any information, contact my supervisors **Dr. E. W. Ansah (0247703379)** or **Dr. J. O. Sarfo (0246485735)**. You may also contact me (Mustapha) on 0248788445 or mustapha.amoadu001@stu.ucc.edu.gh.

Thank you for your participation.

SECTION A: Please mark [√] the box corresponding to your choice regarding each statement below or write where applicable.

1. Gender: a. Male
- b. Female
- c. Others
2. Age
3. Indicate the level of your highest education.
 - a. No formal education
 - b. Basic education
 - c. Vocational training
 - d. Secondary education
 - e. Tertiary education
4. How many years have you been a professional driver
5. Averagely, how many hours do you drive daily
6. Averagely, how many days in a week do you work
7. What is the type of your employment contract?
 - a. Permanent
 - b. Fixed-term
 - c. Casual
8. Do you have a license?
 - a. Yes
 - b. No
9. If yes to question 8, is the license expired?
 - a. Yes
 - b. No

10. If yes to question 8, what class of license do you have?

- a. Class B
- b. Class C
- c. Class D
- d. Class E
- e. Class F

11. What type of bus do you drive?

- a. Minibus
- b. Long bus

12. Who owns the car you drive?

- a. Private company ownership
- b. Public company ownership (Metro Mass & STC)
- c. Individual ownership

13. Do you work on shift system?

- a. Yes
- b. No

14. Do you drive alone?

- a. Yes
- b. No

15. In the past two years, how many times have you been involved in:

- a. Near misses
- b. Accidents

SECTION B: Items in this section are to help understand your perception of working conditions. Please answer with the best option provided by marking [√] the column that most accurately represents your opinion on your working conditions. There is no ‘correct’ or ‘wrong’ answer.

		Strongly Agree (SA)			
		Agree (A)			
		Disagree (D)			
		Strongly Disagree (SD)			
16	My job demands working very fast at all times.				

17.	My job demands hard work all the time.				
18.	My job requires lots of physical effort.				
19.	My job requires moving heavy load.				
20.	My job requires rapid physical activity.				
21.	My job requires working fast.				
22.	My job requires excessive work.				
23.	My car owner/station master is concerned about the welfare of those who work under him or her.				
24.	My car owner/station master pays attention to what I say.				
25.	My car owner/station master is helpful in getting the job done.				
26.	My station master/car owner is successful in getting you to work together.				
27.	People I work with are competent to do their job.				
28.	My job security is good.				
29.	My prospects for career development and promotions are good.				
30.	In five years, my skills will still be valuable.				
31.	In my workplace senior management/car owner acts quickly to correct problems that affect workers' psychological health and safety.				
32.	Senior management/car owner acts decisively when a concern about a worker's health status is raised.				
33.	Senior management/car owner shows support for stress prevention through involvement and commitment towards workers' health matters.				
34.	The well-being of drivers is a priority for my company or car owner.				
35.	Senior management in this company or car owner clearly considers the health and safety of workers to be of great importance.				

36.	Senior management/car owner considers workers' health and safety to be as important as productivity.				
37.	There is good communication between the company/car owner and me about health and safety problems which affect me or other workers.				
38.	Information about workplace well-being is always brought to my attention by my manager or supervisor/car owner.				
39.	Management/car owner listens to my contributions to resolve health and safety problems in this station or company.				
40.	Consultation in health and safety occurs with all the workers in the company or with my car owner.				
41.	Management/car owner encourages workers to be involved in health and safety matters.				
42.	In my company/job, the prevention of stress involves all levels of the workers.				
43.	My work prevents me from spending sufficient quality time with my family.				
44.	There is no time left at the end of the day to do the things I'd like at home (e.g., chores and leisure activities)				
45.	My family misses out because of my work commitments				
46.	My work has a negative impact on my family life				
47.	Working often makes me irritable or short-tempered at home				

SECTION C: The items are to help understand perception of your psychological well-being for the past two weeks. Please respond to the following statements by marking [√] the column that most accurately indicate for each statement how you been feeling over the past two weeks.

		At no time (0)				
		Some of the time (1)				
		Less than half of the time (2)				
		More than half of the time (3)				
		Most of the time (4)				
		All of the time (5)				
48.	I have felt cheerful and in good spirits.					
49.	I have felt calm and relaxed.					
50.	I have felt active and vigorous.					
51.	I woke up feeling fresh and rested.					
52.	My daily life has been filled with things that interest me.					

SECTION D: The items in this section elicit responses on your driving incidents. Please respond to the following statements by marking [√] the column that most accurately describes your experience.

		Nearly all the time (5)				
		Frequently (4)				
		Occasionally (3)				
		Quite Often (2)				
		Hardly ever (1)				
53.	Took a chance and crossed on lights that have turned red.					
54.	Drove above your speed limit.					
55.	Drove even though you consumed alcohol.					
56.	Failed to check your rearview mirror before stopping, changing lanes, etc.					
57.	Turned or changed lanes suddenly.					

APPENDIX B: ETHICAL CLEARANCE

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309
E-MAIL: irb@ucc.edu.gh
OUR REF: UCC/IRB/A/2016/1648
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0011497



24TH NOVEMBER, 2022

Mr. Mustapha Amoadu
Department of Health, Physical Education and Recreation
University of Cape Coast

Dear Mr. Amoadu,

ETHICAL CLEARANCE – ID (UCCIRB/CES/2022/82)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted Provisional Approval for the implementation of your research on **Psychosocial Factors, Perceived Well-Being and Safety Incidents among Long-Distance Commercial Drivers in Ghana**. This approval is valid from 24th November, 2022 to 23rd November, 2023. You may apply for a renewal subject to the submission of all the required documents that will be prescribed by the UCCIRB.

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

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,

A handwritten signature in black ink, appearing to read 'Kofi F. Amuquandoh'.

Kofi F. Amuquandoh

Ag. UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST

APPENDIX C: INTRODUCTORY LETTER

UNIVERSITY OF CAPE COAST
 COLLEGE OF EDUCATION STUDIES
 FACULTY OF SCIENCE AND TECHNOLOGY EDUCATION
 DEPARTMENT OF HEALTH, PHYSICAL EDUCATION & RECREATION

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

EMAIL: hper@ucc.edu.gh

TELEX: 2552, UCC, GH.

Our Ref:



Cables & Telegrams:
 UNIVERSITY, CAPE COAST

28th November, 2022

TO WHOM IT MAY CONCERN

Dear Sir,

INTRODUCTORY LETTER – MR. MUSTAPHA AMOADU

I introduce to you Mr. Mustapha Amoadu a PhD candidate in the Department of Health, Physical Education and Recreation (HPER), University of Cape Coast (UCC). I am the Principal Supervisor to Mustapha's thesis, titled "**Psychosocial Factors, Perceived Well-being and Safety Incidents among Long Distance Commercial Drivers in Ghana**".

Mustapha had successfully defended his thesis proposal and secured Ethical Clearance for data collection. Therefore, I plead that he and his Research Assistants be given every necessary support for a successful data collection.

I count on your usual support.

Yours faithfully

Dr. Edward Wilson Ansah
 HoD, Department of HPER, UCC
 +233-247703379
edward.ansah@ucc.edu.gh

DEPT. OF HEALTH, PHYSICAL EDUCATION
 & RECREATION COLLEGE OF EDUCATION
 STUDIES
 UNIVERSITY OF CAPE COAST
 CAPE COAST - GHANA