MODELLING THE RELATIONSHIPS OF PSYCHOSOCIAL HAZARD AND WORKPLACE SAFETY OUTCOMES AMONG CONSTRUCTION WORKERS IN RIVERS STATE.

ABSTRACT

This research was carried out to investigate therelationship between psychosocial hazards and safety outcomes among workers engaged in a range of industrialconstruction occupations in Rivers State, Nigeria.Design questionnaire was distributed to the respondents. 295 respondents had a complete and usable questionnaire. A conceptual model was posited for this study, the model comprises of equipment and environment, work schedule, role organisation, social aspect, organisational culture, and work life balanceas the workplace psychosocial hazards and near miss, accident, absenteeism, and job performance as the safety outcomes on the study. Structural equation modelling was then usedto test the conceptual model and test the hypotheses using SPSS AMOS software. The result from the study shows that all six workplace psychosocial hazards used in the study had direct significant relationship with the accident safety outcome at p-value (< 0.05). The result also shows that environment and equipment, role in the organization, social aspect and work-life balance showed significant relationships with near miss safety outcome at p-value of .05. The study also inferred that equipment and environment, work schedule, role organisation, social aspect, and organisational culture are factors in the workplace thatmay be associated with absenteeism. The impact of psychosocial hazards experienced by construction workersis an area of growing research as this study has shown, which is yielding results that suggest overall work safety on theconstruction site should consider psychosocial aspects of work.

Keywords: Modelling, psychosocial hazards, construction workers, Rivers state

1. INTRODUCTION

The ‘Workplace’ is one of the social environments that characterise the existence of Man, which apparently provides a plethora of beneficial outcomes to the development of society and individuals (Wooding & Levenstein, 1999).

As with other social climes, the workplace uncovers so many psychological experiences which could be beneficial to the wellbeing of workers as a result of its social structure. According to World Health Organization and International Labour Organization (2002) the workplace provides a platform for one to acquire a social personality away from one’s circle of relatives; it creates an awareness of time design; enhances our ability to build social relationships, by promoting a sense of collaboration; and also helps one to maintain certain level of consistency by being actively engaged. Munir *et al.,* (2011) also demonstrated that good organisational and psychological work characteristics shield employees against unnecessary absenteeism and emotional distress.

Psychosocial hazards are hazards with the characteristic potential of inducing psychological or physical harm to an employee due to the organisational and social framework of the workplace (Cox *et al.,* 2000). By framework, it means interplay of the arrangement and management of the environmental, cultural, and professional conditions prevalent in the workplace; with such having the prospect of causing negative influence on the health of employees (Cox & Griffiths, 2005).

Psychosocial hazards are a broad concept in the context of occupational health, due to the myriad possible social and professional components of work that might be dangerous to employees' health. Its complexity is amplified by the fact that not all employees have the same perspective on organisational features; since individuals have diverse perspectives of the environment in which they operate. **(**D'Amato &Zijlstra, 2003; Lovelock, 2019).

Psychosocial concerns have lately been identified as substantial developing risks in the workplace (NIOSH, 2002; EU-OSHA 2007). They are occasioned by the risk factors specifically relating to the environmental conditions, job content, organisation of workplace, company's culture, social interaction and support structure within and outside the workspace; and the employee's characteristics in relation to the aforementioned conditions (Levi, 2000; Kortum, 2011).

According to Lovelock, (2019); Way, (2020) psychosocial hazards such as job-related stress, assault, bullying, and workplace violence are serious occupational health and safety concerns with employee requirements, competencies, attitudes, and experiences as frequent mediators of their distinctive influence on workers' well-being. Marmot & Wilkinson (2006) succinctly express that a worker's traits and the characteristics in the work environment are major predictors in the study of psychosocial hazard.

The construction and fabrication industries are among the high-ranked in terms of exposure of its workers to occupational safety and health risks; with these risks linked to psychosocial hazards (Kanchana, 2015).

2. CONCEPTUAL FRAMEWORK

The conceptual framework of the research as presented in Figure 1 represents the network arrangements of the study variables; their likely interrelationship within the scope of the study predicated on the researcher's empirical findings from the reviewed literatures. Although, there is room for a study's conceptual design to be hypothetically-based, especially for research that seeks to generate or modify a hypothesis. According to Bas and Tegan (2022), it systematically maps out (visually or in writing form) the different core aspects of the study and the presumed or expected connection of these elements and how they are collectively framed in driving a cohesive and better research outcome.

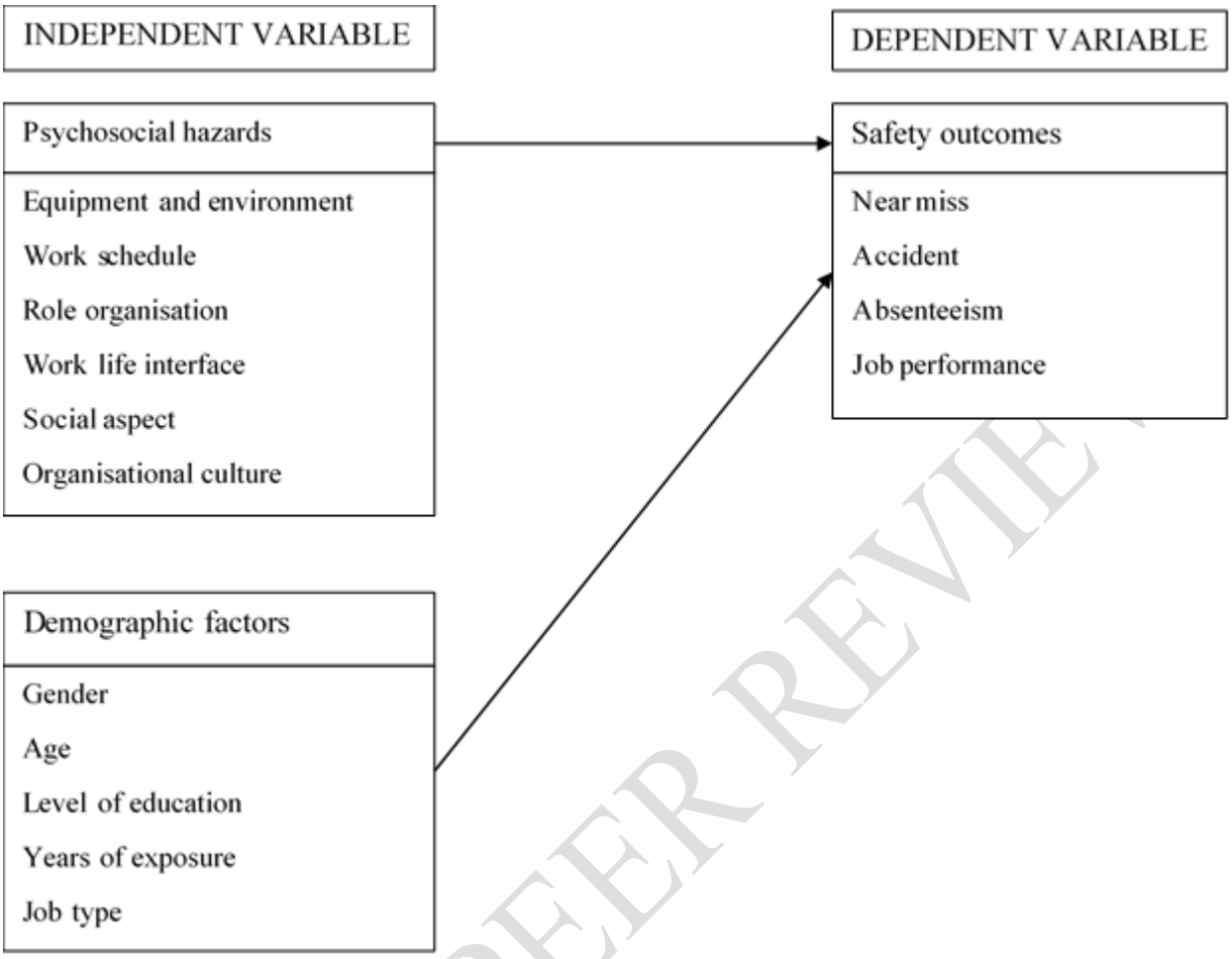

Figure 1: Model of Conceptual Framework

3. METHODOLOGY

This study was carried out on construction workers in Rivers state, Nigeria. For this analysis, a quantitative research approach was adopted, which proceeds by carrying out a survey (questionnaire) designed to determine psychosocial hazards among casual construction workers on construction sites in terms of the aim and objectives of the study. Purposive sampling techniques was used to determine the Local Government Area (LGA) based on the administrative and operational hub for several multinational, indigenous oil and gas companies, which explains the proliferation of construction and fabrication activities in these areas and 3 companies for the research using some criteria such as economic commonality, spatial conformity and staffing culture.Estimation of the sample size was done using Yamane 1967 formula. The sample size was 295 respondents, and they were administered the questionnaire by meeting the inclusion criteria.

The data were first coded based on the Likert scale in SPSS version 26. Composite scores were computed for each psychological risk hazard and safety outcomes construct. Descriptive statistics (mean and standard deviation) were used in evaluating the general respondents' view on

the psychological hazard and safety outcomes construct. Cronbach alpha was used to ensure internal consistency. Pearson correlation analysis was used to explore relationships between psychosocial hazards and safety outcomes. Structural equation modelling (SEM) using Analysis of a Moment Structure (AMOS) software was used to create and test the model. Structural equation modelling multivariate analysis was used to determine the relationship between exogenous (psychosocial factors independent) and endogenous (safety outcomes or dependent) variables.

4. RESULTS & DISCUSSION

4.1 Results

The result from Table 1 shows that majority of the respondents were male. A total of 243 respondents indicated that their gender was male which accounted for 82.4% of the total respondents. A total of 53 respondents indicated that they were females which accounted for 17.6% of the total respondents.

For the Education qualification, the result obtained show that majority of the workers just had secondary school leaving certificate. A total of 180 respondents indicated that they just have secondary school certificate which accounted for 61% of the respondents. Respondent who indicated to have a tertiary degree were 115, which accounted for 39.0% of the total respondents. For work experience most of the respondents had just two to three years' working experience. A total of 137 respondents indicated to just having two to three years' of working experience which accounted for 46.4% of the total respondents.

Table 1. Demographic characteristics of all respondents to the questionnaire from the study

Demographic Criteria	Gender	Frequency	Percentage (%)	Cumulative Percentage (%)
Gender	Male	243	82.4	82.4
	Female	53	17.6	100
Highest Qualification	Secondary Level	180	61.0	61.0
	Tertiary Level	115	39.0	100
Work Experience	2 to 3 years	137	46.4	46.4
	4 to 5 years	105	35.6	82.0
	5 years above	53	18.0	100.0

Table 2. Reliability of Psychosocial Hazard and Safety outcomes construct

Reliability Statistics

Psychosocial risk hazard and Safety outcomes construct	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Environment/Equipment (+)	0.866	0.866
Work load/schedule (-)	0.735	0.739
Role organisation (+)	0.852	0.850
Work-life interface (-)	0.712	0.705
Social aspects (+)	0.688	0.672
Organisational culture (+)	0.719	0.721
Near miss (-)	0.652	0.657
Accident/injuries (-)	0.718	0.722
Absenteeism (-)	0.656	0.657
Job performance (+)	0.754	0.760

Table 3. Mean response by respondents to Psychosocial risk Hazard and Safety outcomes construct

Psychosocial risk hazard and Safety outcomes construct	Mean	St. Dev	Coef. Var	Skewness
Environment/Equipment (+)	3.22	0.75	23.39	0.29
Work load/schedule (-)	3.76	0.43	11.36	-0.66
Role organisation (+)	3.14	0.67	21.35	0.25
Work-life interface (-)	3.84	0.38	9.78	-0.64
Social aspects (+)	2.77	0.43	15.47	0.93
Organisational culture (+)	2.64	0.38	14.45	0.10
Near miss (-)	3.42	0.59	17.12	-0.50
Accident/injuries (-)	3.08	0.62	20.23	-0.09
Absenteeism (-)	2.80	0.63	22.36	-0.14
Job performance (+)	2.00	0.69	34.18	0.62

The mean response for work/schedule was 3.76 which indicates that most of the respondents agreed to the fact that they are often given unfavourable workload/schedule at the workplace. Most of the respondents were of the opinion that they had to work at a high pace throughout the day and they have to strain themselves during work due to time pressure. Most of the respondents were of the opinion that they don't have enough time to complete all their tasks assigned to them in that day. Most respondents agreed that they had little time to focus on a lot of activities at the same time also agreeing that there is little amount of time allocated for recess in the company's policy.

The mean response for work-life interface was 3.84 which indicates that most of the respondents agreed that more often than not that they do have a balance work life interaction due to the nature of their job. Most respondents highlighted that the conditions surrounding the job is not ideal and it causes conflicts between their personal life and job. Most of the respondent complained that the demand from their job does not make them have enough time to co-ordinate the affairs of their private life and they also stated that their friends and family complains that they spend much time at work.

The mean response for social aspects was 2.77 which indicate that they rarely feel social support from their colleagues, bosses, and their organisation. Most of the respondents agreed that they feel they are not part of a family or community at work, and they are mostly left out of things they also highlighted that there is little or no good cooperation amongst their colleagues. They also agreed that they cannot relate their views, ideas, feelings to the management and even to their colleagues. Most respondents agreed that there has been some level of bullying, taunting, threats of occupational violence from workers within 24 months period. Also, the mean value shows some level of undesired sexual attention or advancement in the workplace according to most of the respondents.

4.2 Pearson Correlation Coefficient Analysis

Table 4 shows the relationship between psychosocial hazards and safety outcomes using Pearson correlation coefficient. There was a positive relationship between Environment and Equipment (EE) factor with job performance, implying that adequate and conducive working conditions result to better job performance. Therefore, if construction companies in Rivers state improve on their provision of safe work environment and provision of fit for work equipment and tools, the job performance of workers will improve. Workload/schedule (WS) displayed a statistically significant positive correlation of near miss, accident, and absenteeism. This indicates a positive relationship, suggesting that an increased work schedule (WS) is associated with a higher frequency of near misses, accidents, and absenteeism. Therefore, implying that if construction sites in Rivers state coordinates the work load or high schedules on workers, the frequency of site accidents will be lower. There was a negative relationship between workload/schedule (WS) and job performance (JP). An increase in the workload/schedule (WS) results in a reduction in job performance which implies that if construction companies in Rivers state expects good job performance from their workers they should reduce workload and allow a bit flexible work schedule. Role organization (RO) exhibited statistically significant negative correlations with accident. A higher level of role organization (RO) was associated with a slightly lower level of accidents and vice versa. This shows that when workers are aware of their roles and can develop their skills, there will be low accident frequency. RO has a significant positive relationship with job performance, indicating that if there is no ambiguity in the job role of the worker then there would be higher job performance. The correlation coefficients for the work-life interface with accident and absenteeism were not statistically significant, indicating an absence of a significant relationship between the work-life interface and the specified safety outcomes. Work life

interface (WL) had a positive relationship with accident and a negative relationship with job performance. Workers that indicated having a poor work-life balance which is the conflict from balancing work and family indicated to have more injuries and lower job performance at their workplace. Therefore, if construction companies in Rivers state focuses on improving their work conditions in favour of workers that can help them reduce any conflict between working and living, accident frequency will reduce while job performance will be positive. Social aspect demonstrated a statistically significant positive correlation with job performance (JP). This suggests that when support is received from supervisor and coworker it leads to a better job performance. Organizational culture displayed no statistically significant correlation with near miss (NM), absenteeism (AB), and job performance (JP). This implies that organizational culture does not have a discernible relationship with the specified safety outcomes. Organizational culture (OC) had a significant negative relationship with accidents, which implies that if the company has a positive safety culture and norms where communications are effective, it will result in fewer accidents. The positive correlation between NM and AC was statistically significant, indicating an increase in near misses is associated with an increase in accidents, and vice versa. There was a positive correlation between NM and AB which was statistically significant. The correlation between JP and NM was statistically significant (-0.21), indicating a negative relationship. Higher job performance is associated with a slightly lower level of near misses. The correlation coefficients for Environment/Equipment with near-miss, accidents/injuries, and absenteeism were not statistically significant, implying no discernible relationship between environmental and equipment factors and the specified safety outcomes.

Table 4. Pearson Correlation showing the relationship between Psychosocial Hazard and Safety outcomes

Variables	EE	WS	RO	WL	SA	OC	NM	AC	AB	JP
EE	**1.00**									
WS	-0.06	**1.00**								
RO	**0.85**	0.01	**1.00**							
WL	**-0.18**	**0.25**	**-0.17**	**1.00**						
SA	**0.43**	0.10	**0.33**	**-0.13**	**1.00**					
OC	0.06	-0.10	0.04	0.00	**-0.17**	**1.00**				
NM	-0.07	**0.95**	0.01	**0.24**	0.10	-0.10	**1.00**			
AC	-0.11	**0.26**	**-0.12**	0.08	**0.28**	**-0.17**	**0.27**	**1.00**		
AB	0.09	**0.22**	0.08	0.11	**0.30**	-0.09	**0.27**	**0.37**	**1.00**	
JP	**0.56**	**-0.18**	**0.47**	**-0.21**	**0.52**	0.00	**-0.21**	0.11	0.01	**1.00**

Values in bold are different from 0 with a significance level alpha=0.05

4.3 Structural Equation Modelling

The result of the relationship between the psychosocial hazard factor and safety outcome in Construction Company in Rivers States was evaluated using a two-part model. The first part of the model was the confirmatory factor analysis (measurement model) which evaluated the

reliability of the indicator variables used in measuring each construct and the second part model was the structural equation modelling which test the hypothesis of the study.

4.4 Confirmatory Factor Analysis

The result of the confirmatory factor analysis is presented in Tables 5 to 7 and the model diagram is presented in Figure 2. Table 5 shows the result of the chi-square test which is used to evaluate whether the model fits the sample data set. The result from Table 5 showed that the chi-square test was statistically significant ($\chi^2 = 2214.654$, df=694, p-value=0.000), therefore the null hypothesis was rejected. Failure to reject the null hypothesis state that the data contain covariance information that does not speak against the model.The result from the goodness of fit indexes is presented in Table 6

Table 5. Chi-Square Goodness of Fit

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	126	2214.654	694	.000	3.191
Saturated model	820	.000	0		
Independence model	40	5263.985	780	.000	6.749

Table 6. Goodness of fit index statistic

Goodness of Fit Statistic	**Value**
CFI	0.932
RMSEA	0.086
SRMSE	0.0896
GFI	0.914
AGFI	0.913

Table 7: Regression weight (Unstandardized)

Paths			Estimate	S.E.	C.R.	P
Nearmiss	<---	Environment_Equipment	-.716	.139	-5.161	***
Accident	<---	Environment_Equipment	-1.737	.280	-6.206	***

Paths			Estimate	S.E.	C.R.	P
Absenteeism	<---	Environment_Equipment	-3.628	.309	-11.754	***
Job_Perfromance	<---	Environment_Equipment	4.361	.187	23.294	***
Nearmiss	<---	Work_Schedule	.000	.053	-.007	.995
Accident	<---	Work_Schedule	.710	.108	6.584	***
Absenteeism	<---	Work_Schedule	1.481	.119	12.454	***
Job_Perfromance	<---	Work_Schedule	-1.799	.072	-24.953	***
Nearmiss	<---	Role_Organization	.679	.106	6.383	***
Accident	<---	Role_Organization	1.104	.215	5.139	***
Absenteeism	<---	Role_Organization	2.781	.237	11.740	***
Job_Perfromance	<---	Role_Organization	-3.209	.144	-22.341	***
Nearmiss	<---	Social_Aspect	.305	.073	4.182	***
Accident	<---	Social_Aspect	1.290	.147	8.762	***
Absenteeism	<---	Social_Aspect	2.259	.162	13.914	***
Job_Perfromance	<---	Social_Aspect	-1.140	.098	-11.576	***
Nearmiss	<---	Organization_Culture	-.190	.185	-1.024	.306
Accident	<---	Organization_Culture	.991	.374	2.650	.008
Absenteeism	<---	Organization_Culture	3.053	.413	7.402	***
Job_Perfromance	<---	Organization_Culture	-2.249	.250	-8.989	***
Nearmiss	<---	Work_Life	.934	.034	27.800	***
Accident	<---	Work_Life	-.323	.068	-4.754	***
Absenteeism	<---	Work_Life	-.084	.075	-1.123	.261
Job_Perfromance	<---	Work_Life	-.532	.045	-11.716	***

The critical ratios and the unstandardized path estimatebetween latent variables are presented in Table 3. Twenty of the twenty-four paths within the model are significant at a 0.001 level; onepath is significant at a 0.008 level, and only three paths (therelationship between near miss and work schedule, nearmiss and organisational culture, and absenteeism and work life) are not significant,although theyshow the signs in the expected direction.The structural model shows environment and equipment, role in the organisation, and social aspects as influencing alloutcome variables through direct orindirect pathways. Specifically, the environment and equipment, role organisation, social aspect and work life balance directly affects or influences nearmiss. Psychosocial hazards which include environment and equipment, work schedule, role organisation, social aspect, work life all directly influences accidents. The experience of work-related psychosocial hazards which include environment and equipment, work schedule, role organisation, social aspect, organisational culture, and work life all directly influences absenteeism. All the signs were in agreement with the hypotheses.

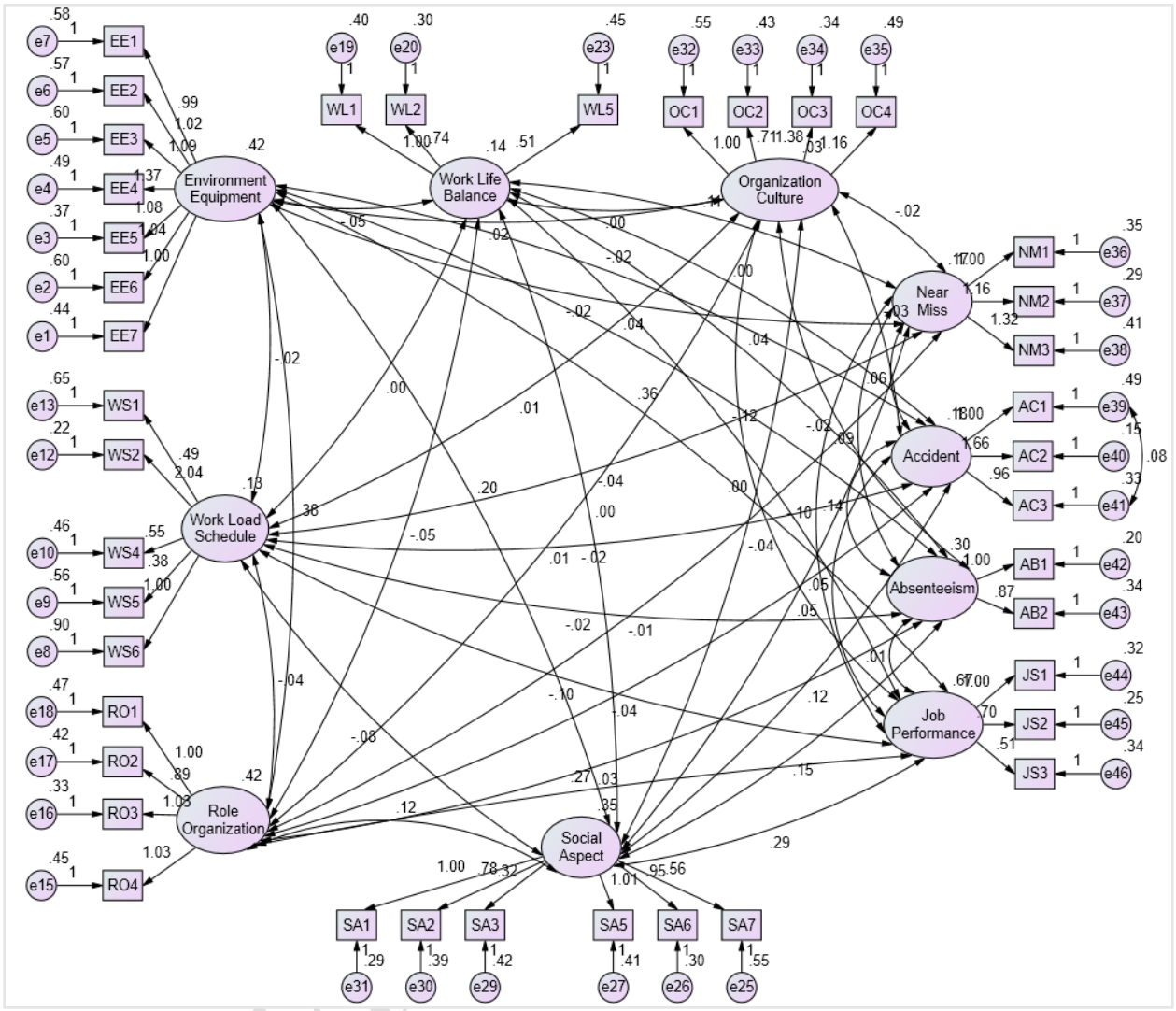

Figure 2. Unstandardized path coefficient for the confirmatory factor analysis

4.5 Discussions

Results from the analysis in Table 7 show that the relationship between the culture of the organisation and absenteeism is significant which implies that positive or negative organisational culture significantly affects the level of absenteeism among workers. This was supported by Goetzel et al., (2002) where it was highlighted that there are evidence showing organisational culture psychosocial hazards has effects on indices such as absenteeism, sickness absence, productivity.

From the results, it was shown that poor safety culture within the organisation which makes work unfavourable for workers leads to accident in the company. Lamdsbergis (2003) supports this claim highlighting those workplaces with poor safety culture and unfavourable psychosocial

conditions seem to showhigher accident and injury rate. Therefore, if organisations decide to focus on improving the general safety culture or improve the perception of workers about the level of safety within the organisation, there will be corresponding reduction of accident cases.

Karasek et al., (1998) suggested that high work schedule, high job demands, and low job control(decision latitude) were the key factors that together produced job strain,increasing the risk of physical and mental illness, accident as well as injuries. It was identified from the result in Table3 that as high work schedule which are unfavourable to workers within the organisation increases accident increases as well. This shows that Karasek et al., (1998) supports the finding that high work schedule leads to increasing accidents.

The home-workinterface(work-life balance) is also an important factor in thegeneral health of individuals considering that, on the one hand, the interaction between work and thefamily can be a source of pressure itself and, on the other, this relationship canbe a source of "spill-over" stress as well. A positive environment where there isrecognition of the need for balance between the demands of work, family andpersonal life is, therefore, essential whereas a negative working environment without the values of balancing working and living will lead to mental illness, physical injuries, near misses and accident (Burton, 2010). This is in line with one of the findings of this research where it was highlighted that work life psychosocial hazards and accident and or near miss safety outcomes has a significant relationship. It was stated that there is a positive effect in this relationship as it was implied that any increase in poor work life balance among workers leads to accident.

5. CONCLUSION

This study is an attempt to further an understanding of the relationshipworkplace psychosocial hazards has with safety outcomes within construction companies in Rivers state, thereby one can know the outcomes of these hazards within their organization. Psychosocial hazards are present in all workplaces and are mostly hidden due to the little information some workers have about them. Some workers may not be able to identify that these hazards are the causes of some accidents, absenteeism, near miss within their organization. Mosty workers do not know the cause-and-effect relationship of psychosocial hazards and safety outcomes.

For the current research, the data used were gathered fromconstruction professionals, also a conceptual model was posited.This model comprises of equipment and environment, work schedule, role organisation, social aspect, organisational culture, and work life balanceas the workplace psychosocial hazards and near miss, accident, absenteeism, and job performance as the safety outcomes on the study. Structural equation modelling was then usedto test the conceptual model.

The results shows that all six workplace psychosocial hazards used in the study had significant relationships with the accident safety outcome. This is to show that the organisations should investigate all psychosocial hazards in the study and proceed with the recommendations of this

study to help reduce accidents that are directly or indirectly caused by these hazards. The result also shows that environment and equipment, role in the organization, social aspect and work-life balance showed significant relationships with near miss safety outcome in the model whereas organizational culture and work schedule did not share the same result. It can be inferred from these relationships in the study that equipment and environment, work schedule, role organisation, social aspect, and organisational culture are factors in the workplace thatmay be associated with absenteeism.

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