CHAPTER IV

DATA ANALYSIS AND RESULTS

4.1 Introduction

This chapter presents analysis of the collected about the research questions and objectives of the study. Data cleaning, coding, screening, and response rate were all covered in this chapter. Demographic features and descriptive analysis were also covered. The findings of the research utilizing SEM as an analytical technique were discussed in the last section of this chapter. This is divided into two stages: measurement model evaluation and structural equation model evaluation (SEM) evaluation through direct and mediated effects.

4.2 Data Cleaning and Coding

After gathering data from Skikda Oil and Gas Refinery employees, data cleaning was carried out to verify the correctness and consistency of the information gathered. Cleaning is an essential component of data analysis and data processing (Zikmund (2000). Sekaran (2000) elaborates on this point, stating that questionnaires with more than 25% unanswered items should be rejected, while respondents who completed at least 75% of the questionnaire are acceptable. The coding methods in this research were carried out by creating a data file in AMOS 24.0.

4.3 Data Screening and Missing Data

Data screening is a crucial step in the data analysis process before moving on to Structural Equation Modelling. Data screening, according to Tabachnick & Fidell (2007), include verifying data input correctness, dealing with missing numbers, and identifying outliers. Data that has not been filtered may have an impact on the analyses' outcome. This may have an impact on the data's outcome. Before the appropriate analysis, it is critical to verify that data is

properly gathered, and that the distribution is normal. For the purposes of this research, mean and standard deviation were utilized to screen and evaluate the correctness of the data supplied. All the answers fell inside the 5-point Likert scale. According to Kline (2005), if missing values account for less than 5% of a single variable, the missing data are deemed to be incidental and not systematic, and there is no cause for worry. Cohen and Cohen (1983) endorse this perspective, stating that a missing data value of up to 10% is not regarded significant and unlikely to be harmful. The missing value in this research is approximately 6%, which is far below the prior study's estimate of 10% (Kline, 2005).

4.4 Response Rate

Data was collected from the employees of Skikda Oil and Gas Refinery. Four hundred (400) questionnaires were distributed and 376 were useable after cleaning the missing data. This represents 94% response rate. The survey has an effective sample size of 376 useable completed questionnaires since only 6% of the questions were invalid.

4.5 Demographic Characteristics

As stated in previous chapter, the employees' profile information was presented in this study. The employees' characteristics sample are important because the unit of analysis used in this study is at individual level (individual employees). The results shown in Table 4-1, 4-2, 4-3, 4-4, 4-5, 4-6, 4-7, 4-8 indicate differences in the demographics of the respondents including Gender, Age, Marital Status, Income, Educational Level, Job Position, Department/Unit and Years in Service respectively.

4.5.1 Gender

As illustrated in the Table 4-1, the gender of the respondents indicates a higher number of males (374) respondents and (2) females representing 99.5% and 0.5% respectively.

Table 4-1: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	374	99.5	99.5	99.5
	Female	2	0.5	0.5	100.0
	Total	376	100.0	100.0	

4.5.2 Age of the Respondents

As illustrated in the Table 4-2, the age of the individual respondents indicates most of the employees are around 28 years of age.

Table 4-2: Age of Respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	22	1	.3	.3	.3
	23	3	.8	.8	1.1
	24	7	1.9	1.9	2.9
	25	19	5.1	5.1	8.0
	26	16	4.3	4.3	12.2
	27	19	5.1	5.1	17.3
	28	26	6.9	6.9	24.2
	29	17	4.5	4.5	28.7
	30	14	3.7	3.7	32.4
	31	11	2.9	2.9	35.4
	32	16	4.3	4.3	39.6
	33	20	5.3	5.3	44.9
	34	20	5.3	5.3	50.3
	35	19	5.1	5.1	55.3
	36	21	5.6	5.6	60.9
	37	24	6.4	6.4	67.3
	38	23	6.1	6.1	73.4
	39	21	5.6	5.6	79.0
	40	17	4.5	4.5	83.5
	41	13	3.5	3.5	87.0
	42	15	4.0	4.0	91.0
	43	13	3.5	3.5	94.4
	44	7	1.9	1.9	96.3
	45	9	2.4	2.4	98.7
	46	2	.5	.5	99.2
	47	2	.5	.5	99.7
	48	1	.3	.3	100.0
	Total	376	100.0	100.0	

4.5.3 Marital Status

As illustrated in the Table 4-3, the marital status of the individual respondents indicates a higher number of married workers (289) respondents than singles (84) and divorced (3) representing 76.9%, 22.3% and 0.8% respectively

Table 4-3: Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	289	76.9	76.9	76.9
	Single	84	22.3	22.3	99.2
	Divorced	3	.8	.8	100.0
	Total	376	100.0	100.0	

4.5.4 Income of the Respondents

As illustrated in the Table 4-4, the worker's income of the individual respondents indicates majority of the respondents earned around 800 and 900 representing 13% and 8.5% respectively.

Table 4-4: Income of the Respondents					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	750	13	3.5	3.5	3.5
	760	1	.3	.3	3.7
	780	8	2.1	2.1	5.9
	790	3	.8	.8	6.6
	800	49	13.0	13.0	19.7
	850	5	1.3	1.3	21.0
	860	1	.3	.3	21.3
	880	12	3.2	3.2	24.5
	890	7	1.9	1.9	26.3
	900	32	8.5	8.5	34.8
	950	4	1.1	1.1	35.9
	980	7	1.9	1.9	37.8
	1000	18	4.8	4.8	42.6
	1100	12	3.2	3.2	45.7
	1200	16	4.3	4.3	50.0
	1250	1	.3	.3	50.3
	1300	4	1.1	1.1	51.3
	1400	5	1.3	1.3	52.7
	1500	8	2.1	2.1	54.8
	1600	11	2.9	2.9	57.7
	1700	9	2.4	2.4	60.1
	1800	33	8.5	8.5	68.6
	1900	17	4.5	4.5	73.1
	2000	13	3.5	3.5	76.6
	2200	15	4.0	4.0	80.6
	2300	32	8.5	8.5	89.1
	2400	13	3.5	3.5	92.6
	2500	10	2.7	2.7	95.2
	2600	12	3.2	3.2	98.4
	2800	2	.5	.5	98.9
	3600	1	.3	.3	99.2
	4600	1	.3	.3	99.5
	4900	1	.3	.3	99.7
	Total	376	100.0	100.0	

4.5.5 Educational Level

As illustrated in the Table 4-5, the educational level of the individual respondents indicate majority of the respondents are diploma/college graduate, bachelor's degree and secondary school representing 54%, 30.9% and 15.2% respectively.

Table 4-5: Educational Level					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Secondary	57	15.2	15.2	15.2
	Diploma/College	203	54.0	54.0	69.1
	Bachelor	116	30.9	30.9	100.0
	Total	376	100.0	100.0	

4.5.6 Job position

As illustrated in the Table 4-6, the job position of the individual respondents indicate majority of the respondents are senior staff representing 55.9%; of which it comprises of the managerial team, and junior staff representing 44.1.%.

Table 4-6: Job position					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior Staff	166	44.1	44.1	44.1
	Senior Staff	210	55.9	55.9	100.0
	Total	376	100.0	100.0	

4.5.7 Department/Unit of Workers

As illustrated in the Table 4-7, the Department/Unit of the employees indicate all respondents are given equal chances representing around 5.3% to 7.2%.

Table 4-7: Department/Unit of Workers					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Technical Directorate	23	6.1	6.1	6.1
	Managing Directorate	3	.8	.8	6.9
	Regional Management	23	6.1	6.1	13.0
	SIE	21	5.6	5.6	18.6
	EP Director	27	7.2	7.2	25.8
	Directorate XP	21	5.6	5.6	31.4
	Directorate ONR	26	6.9	6.9	38.3
	TOUAT Directorate	22	5.9	5.9	44.1
	legal division	20	5.3	5.3	49.5
	IT Division	23	6.1	6.1	55.6
	Supply Division	24	6.4	6.4	62.0
	RHU Division	25	6.6	6.6	68.6
	HSE	23	6.1	6.1	74.7
	Finance Division	24	6.4	6.4	81.1
	NOC Division	24	6.4	6.4	87.5
	LOG Directorate	23	6.1	6.1	93.6
	MN Directorate	24	6.4	6.4	100.0
	Total	376	100.0	100.0	

4.5.8 Years in Service

As illustrated in the Table 4-8, the years in service of the individual respondents indicate majority of the respondents have spent 2-3 years in service representing 20.2% and 16% respectively.

Table 4-8: Years in Service					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	23	6.1	6.1	6.1
	2	76	20.2	20.2	26.3
	3	60	16.0	16.0	42.3
	4	20	5.3	5.3	47.6
	5	12	3.2	3.2	50.8
	6	35	9.3	9.3	60.1
	7	16	4.3	4.3	64.4
	8	21	5.6	5.6	69.9
	9	13	3.5	3.5	73.4
	10	24	6.4	6.4	79.8
	11	16	4.3	4.3	84.0
	12	23	6.1	6.1	90.2
	13	17	4.5	4.5	94.7
	14	11	2.9	2.9	97.6
	15	6	1.6	1.6	99.2
	16	3	.8	.8	100.0
	Total	376	100.0	100.0	

4.6 Analysis of Result

The descriptive data for the survey indicator were obtained from Table 4-9. Each indicator's mean, standard deviation, lowest value, and maximum value were calculated using SPSS version 24.0. The descriptive statistics derived from survey instruments for the model are shown in this table. The model's descriptive statistics for the construct are shown in Table 4-9. The model's indicators were all rated on a 5-point Likert scale. All the data that was measured in this model used data goals.

Table 4-9: Descriptive Statistics for Survey Indicator

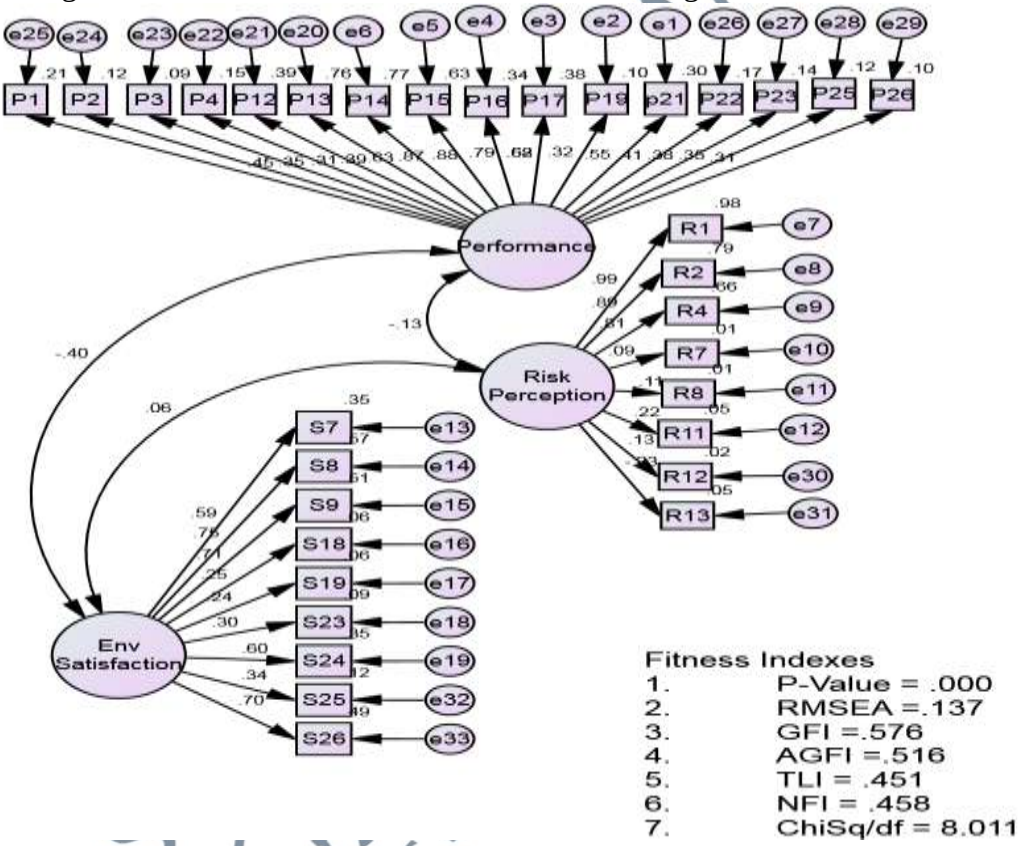
Construct	Items	N	Minimum	Maximum	Mean	Std. Deviation
Work Environment Satisfaction	S7	376	2	4	2.12	.341
	S8	376	2	4	2.53	.861
	S9	376	2	4	2.36	.651
	S18	376	2	5	3.20	.847
	S19	376	2	5	3.23	.836
	S23	376	1	4	2.11	.477
	S24	376	1	4	2.09	.798
	S25	376	1	5	2.11	.426
	S26	376	1	4	2.29	.551
Employees' Performance	P1	376	1	5	3.54	.601
	P2	376	2	5	3.78	.592
	P3	376	3	5	4.30	.605
	P4	376	2	5	3.89	.606
	P12	376	1	5	3.83	.661
	P13	376	2	5	4.04	.559
	P14	376	2	5	4.08	.531
	P15	376	2	5	3.98	.589
	P16	376	1	5	1.61	.963
	P17	376	1	4	1.57	.790
	P19	376	1	4	2.66	.584
	P21	376	2	5	4.07	.596
	P22	376	3	5	4.72	.475
	P23	376	2	5	4.71	.484
	P25	376	2	5	4.08	.543
	P26	376	2	5	3.97	.615
Risk Perception	R1	376	1	4	3.82	.591
	R2	376	1	5	3.80	.620
	R4	376	1	5	3.84	.631
	R7	376	1	4	2.06	.399
	R8	376	1	4	2.13	.559
	R11	376	1	4	2.00	.310
	R12	376	1	4	2.00	.225
	R13	376	1	4	1.33	.518

4.6.1 Analysis of the Data

As stated earlier, the analysis and interpretation of a structural equation model involves the following processes. It begins with a review of the CFA measurement model, followed by a review of the structural equation model.

4.6.1.1 The CFA Measurement Model Combining All Latent Constructs Simultaneously

Figure 4-1: Pooled Measurement Model Combining All Latent Constructs



Certain fitness indices for the pooled constructs do not meet the necessary threshold in order to determine the factor of this research (as indicated in Figure 4-1). When the researchers looked at the factor loading, they found that, the loading for item P1, P2, P3, P4, P19, P21, P22, P23, P25, P26 (from construct Performance), items R7, R8, R11, R12, R13 (from construct Risk perception); and item S18, S19, S23, S24, S25 (from construct Work Environment Satisfaction) are below 0.5. These items have caused the measurement model for the constructs to be poorly

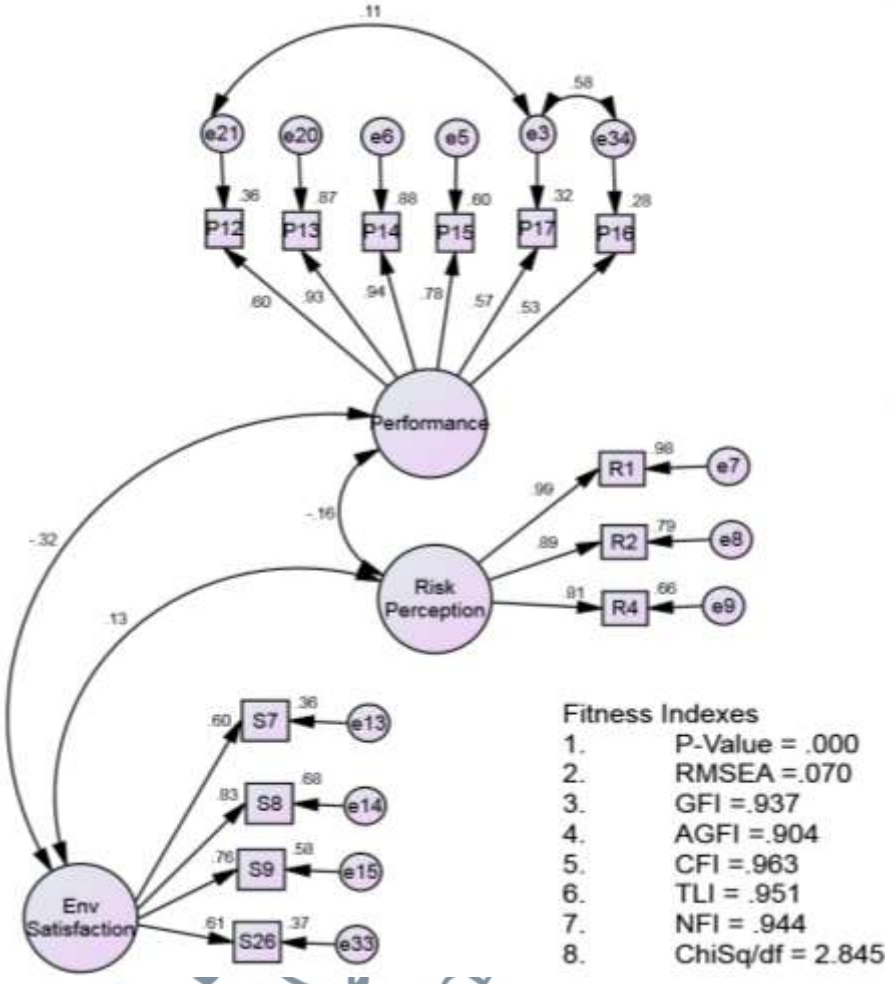
fit. Therefore, the items were deleted one by one, and the new measurement model was re-run as shown in Figure 4-2.

After the deletion of all the stated items, the fitness index for AGFI is still below the required level even though the factor loading for all items are above 0.5. Thus, one might suspect that certain items were redundant of each other in the measurement model. The items redundancy was examined through inspecting the Modification Indexes (MI). These factors contributed to the measurement model's poor fit.

Because the fitness index AGFI did not reach the necessary level of 0.9 owing to superfluous elements, the research changed the measuring methodology. According to Zainudin (2012), the researcher has two options when dealing with the redundant items in the model: delete one of the two redundant items and run the new measurement model or set these two correlated measurement errors of redundant items as a "free parameter" and run the new measurement model.

For the purpose of this study, the redundant items were not deleted, and free parameters was introduced between (P12 and P17) and (P16 and P17). The fitness index conditions were achieved. Consequently, as shown in Figure 4-2, a new measuring model has been developed.

Figure: 4-2: The New Measurement Model for Pool Construct: *Factor loading, correlation and R^2*



After achieving factor loading, the research moves on to checking the data's unidimensionality.

4.6.1.2 Unidimentionality

Unidimentionality is achieved when the measuring items have acceptable factor loadings for the respective latent construct. In order to ensure unidimentionality of a measurement model, any item with a low factor loading should be deleted (Zainudin, 2012). For already established items the factor loading for an item should be 0.5 or higher. All the other variables in table 4-10

met the Unidimentionality criteria and were over the 0.5 limits. Thus, all item removed are with low factor loading below 0.5

Table 4-10: Factor Loading for the Model

Construct	Factor Loading	N
	Items	Loading
		1
Work Environment Satisfaction		
	S7	0.60
	S8	0.83
	S9	0.76
	S18	Removed
	S19	Removed
	S23	Removed
	S24	Removed
	S25	Removed
	S26	0.61
Employees' Performance	P1	Removed
	P2	Removed
	P3	Removed
	P4	Removed
	P12	0.60
	P13	0.93
	P14	0.94
	P15	0.78
	P16	0.53
	P17	0.57
	P19	Removed
	P21	Removed
	P22	Removed
	P23	Removed
	P25	Removed
	P26	Removed
Risk Perception	R1	0.99
	R2	0.89
	R4	0.81
	R7	Removed
	R8	Removed
	R11	Removed
	R12	Removed
	R13	Removed

4.6.1.3 Fitness Index of the Model

When the Fitness Indexes for a construct reach the necessary level, construct validity is established. Table 4-11 shows the fitness indices and degree of need for this research.

Table 4-11: Fitness Index for the Model

Type	Name of Index	Acceptable Fit	Index value of the study	Comments
1. Absolute fit	Chisq		Sample size=376	The required level is achieved
	p-value	P greater than 0.05	0.000	
	RMSEA	RMSEA less than 0.080	0.070	
	GFI	GF1 greater than 0.90	0.937	
	AGFI	AGF1 greater than 0.90	0.904	
2. Incremental fit	CFI	CF1 greater than 0.90	0.963	The required level is achieved
	TLI	TF1 greater than 0.90	0.951	
	NFI	NF1 greater than 0.90	0.944	
3.Parsimonious fit	Chisq/df	Chi square/df less than 5.0	2.845	The required level is achieved

In the Table 4-11, the required level of the absolute fit such as the p-value of the study is significant at 5% level. The RMSEA should range between 0.050 and 0.080. While 0.050 is a good fit, value that falls within 0.080 is an acceptable fit (Zainuddin, 2012). However, the study RMSEA is 0.070 a value that meet the required level. The GFI and AGFI are greater than 0.90 required threshold. In order to measure the incremental fit, the CFI, TFI, NFI are greater than 0.90 thresholds as required. The parsimonious fit shows that chi square/df of the study 2.845 is less than the 5.0 as required. This shows that the data are fit for the structural equation modeling. As a consequence of the model's sufficient unidimensionality and fitness index, all of the constructs were valid measures based on their parameter estimations (Chow & Chan, 2008).

4.6.2 Measurement of Structural Equation Model (Hypothesis Testing)

The next stage after analyzing the CFA measurement model is to create a structural equation model by analyzing the model. In order to test for significance, the data was tested using 1000 bootstrapped samples as suggested by Davidson and Mackinnon (2000) with 376 cases for the model sample.

Structural equation model was used in this study to determine the overall direct effect of the factors affecting the employees' performance at Skikda Oil and gas refinery and to assess the mediating effect of the risk perception on employees' performance.

4.6.2.1 Direct (Unconstrained) Effect of the Constructs

The findings demonstrated sufficient unidimensionality and the model's fitness index, indicating that all constructs were legitimate measures based on their parameter estimates (Chow & Chan, 2008)

H_1: There is significant difference in employees' risk perception and their performance among staff of Skikda oil refineries in Algeria

Figure 4-3: Regression Weights: Employees' Risk Perception and their Performance

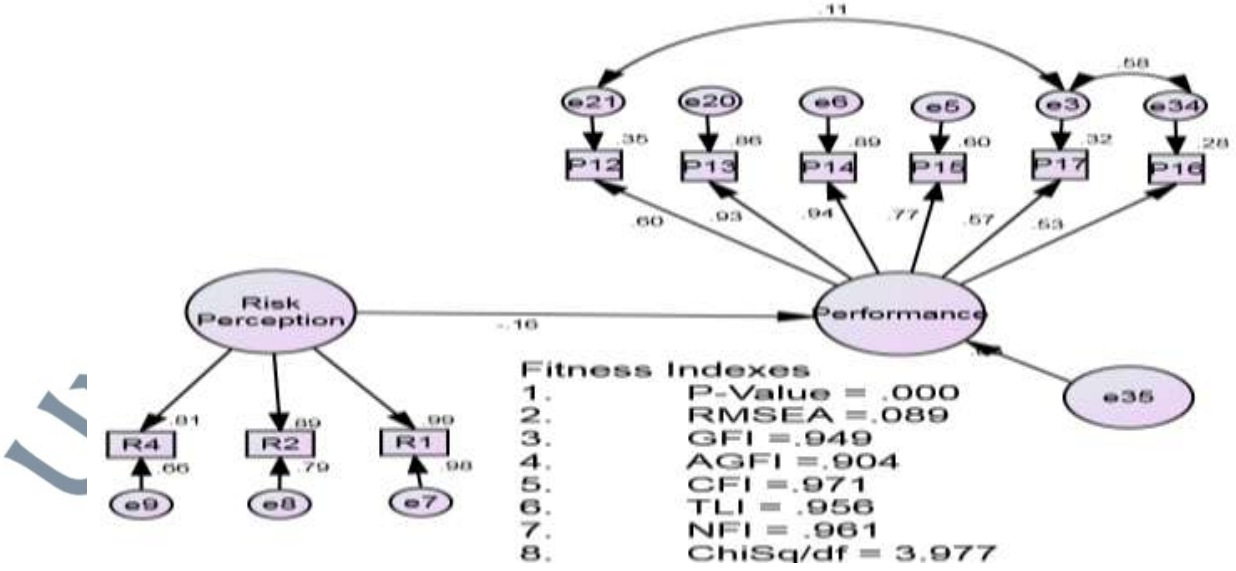


Table 4-12: Regression Weights: Employees' Risk Perception and their Performance

			Estimate	S.E.	C.R.	P-value	Result on hypothesis
Employees' Performance	<---	Risk Perception	-0.163	0.042	-3.881	.003	Significant

The study models the simple effect of risk perception on employees' performance as shown in Figure 4-4. As illustrated in Figure 4-4, the research investigates the direct impact of risk perception on employees' performance. B1 is -0.163, and it has a significant impact on employees' performance (p-value 0.05), as shown in Table 4-13. In other words, the regression weight for the risk perception in the prediction of perceived level of performance is significantly different from zero at the 0.05 level (two-tailed). In other words, the hypothesis stated above is significant.

H_2: There is significant difference in the effect of work environment satisfaction and employees' performance among staff of Skikda oil refineries in Algeria.

Figure 4-4: Regression Weights: Work Environment Satisfaction and Employees' Performance

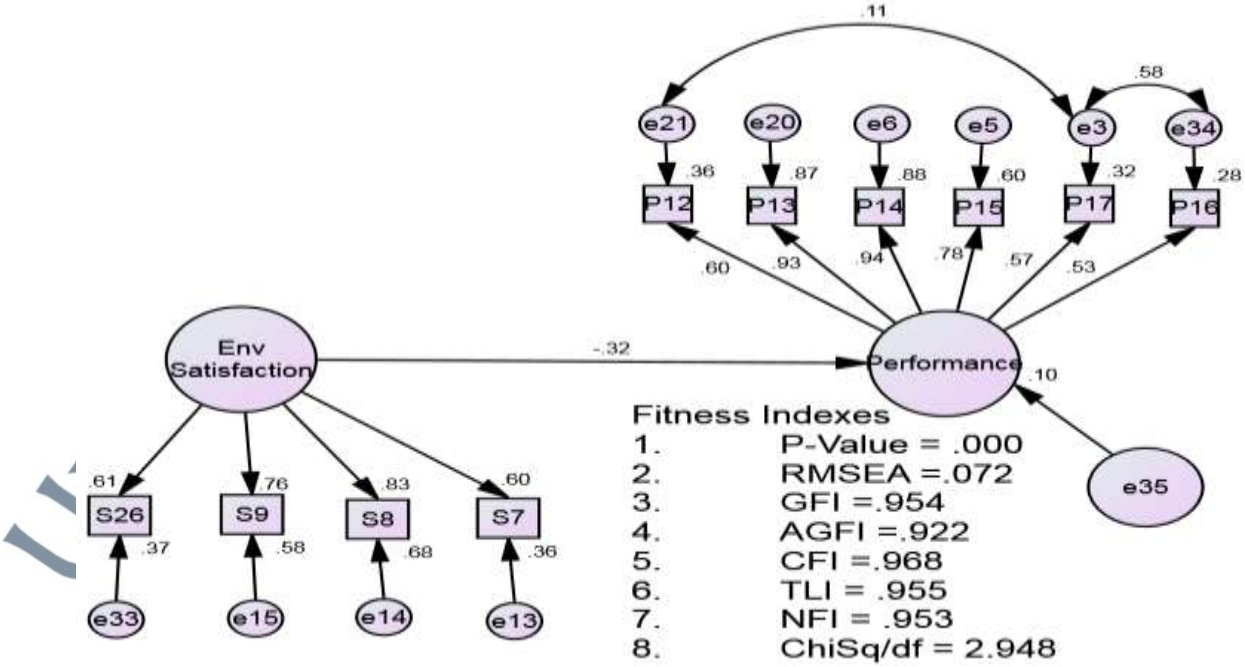


Table 4-13: Regression Weights: Work Environment Satisfaction and Employees' Performance

			Estimate	S.E.	C.R.	P-value	Result on hypothesis
Employees' Performance	<---	Env_ Satisfaction	-0.324	.144	-2.500	0.000	Significant

To begin, as illustrated in Figure 4-3, the research models the basic impact of work environment satisfaction on employees' performance. As illustrated in Figure 4-3, the research investigated the direct impact of work environmental satisfaction on employees' performance. B1 is -0.324, and it has a substantial impact on employees' performance (p-value 0.001), as shown in Table 4-12. In other words, the regression weight for work environment satisfaction in the prediction employees' performance is significantly different from zero at the 0.001 level (two-tailed). In other words, the hypothesis stated above is significant.

H_3: There is significant difference in employees' risk perception level and work environment satisfaction among staff of Skikda oil refineries in Algeria

Figure 4-5: Regression Weights: Risk Perception and Work Environment Satisfaction

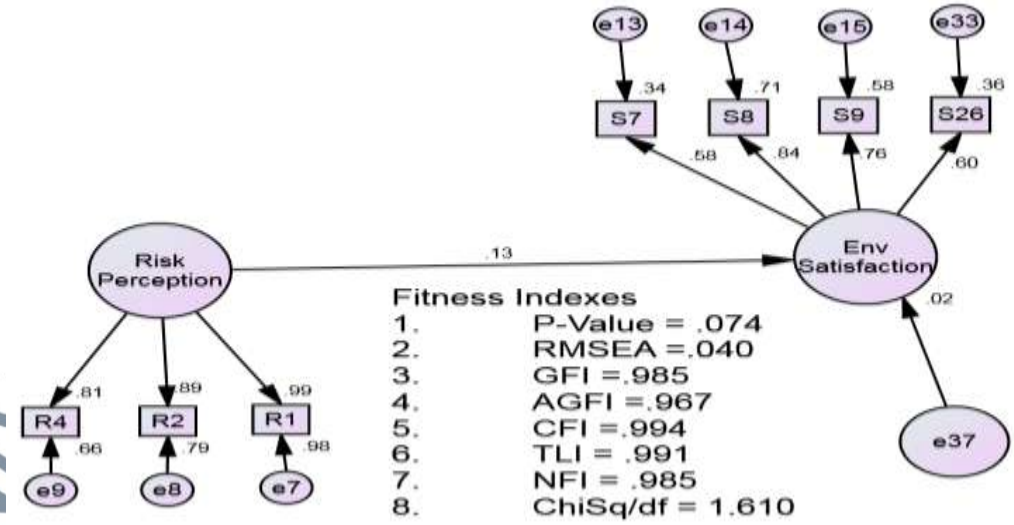


Table 4-14: Regression Weights: Risk Perception and Working Environment Satisfaction

			Estimate	S.E.	C.R.	P-value	Result on hypothesis
Env_ Satisfaction	<---	Risk Perception	0.126	0.020	6.300	0.029	Significant

The study models the simple effect of work environment satisfaction on risk perception, figure 4-5 depicts this view. As illustrated in Figure 4-5, the research investigates the direct impact of work environmental satisfaction on risk perception. B1 is 0.126, and it has a substantial impact on risk perception (p-value 0.05), as shown in Table 4-14. In other words, the regression weight for work environment satisfaction in the prediction of risk perception is significantly different from zero at the 0.05 level (two-tailed). In other words, the hypothesis stated above is significant.

4.6.2.2 Mediating Effect of Latent Constructs

After running the model for direct effect (unconstrained), the next is the inclusion of risk perception to test the mediating effect on the employees' performance. First, the direct effect of independent variable on dependent variable is significant. When the mediator variable "risk perception" enters the model, the direct effect would be reduced since some of the effect has shifted through the mediator. If it is reduced but still significant, the mediation effect here is called "partial mediation". However, if the direct effect is reduced and no longer significant, then the mediation is called "complete mediation" (Zainudin, 2012). The mediation effect was tested through Hypothesis 4.

H_4: Employees' risk perception mediates the relationship between work environment satisfaction and employees' performance among staff of Skikda oil refineries in Algeria.

Figure 4-6: Regression Weights: Mediating Effect of Latent Constructs (Risk Perception)

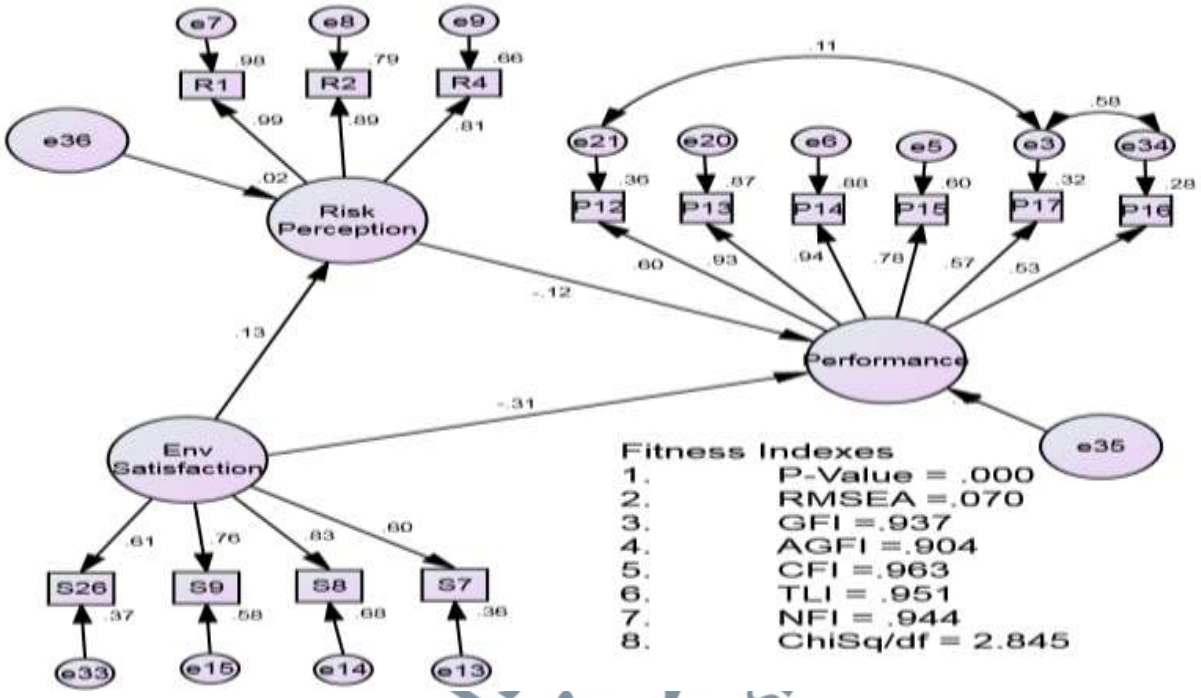


Table 4-15: Regression Weights: Mediating Effect of Latent Constructs (Risk Perception)

			Estimate	S.E.	C.R.	P-value	Result	Result on hypothesis
Employees' Performance	<---	Env_Satisfaction	-0.308	.143	-2.154	***	Significant	Partial mediation
Risk Perception	<---	Env_Satisfaction	0.128	.166	0.771	.027	Significant	Indirect effect
Employees' Performance	<---	Risk Perception	-0.124	.040	-3.100	.019	Significant	Indirect effect

***Observe that the direct effects of work environment satisfaction are reduced from 0.324 to 0.308 after Risk perception entered the model

The hypothesis testing for a direct effect of work environment satisfaction on the employees' performance and work environment satisfaction has significant and direct effects on employees' performance. Beta coefficient is reduced from 0.324 in Table 4-12 to 0.308 in Table

4-15. The Hypothesis is supported. In examining, the hypothesis testing for the causal effect of environmental satisfaction on risk perception, work environment satisfaction has significant and direct effects on risk perception; the hypothesis was supported. However, in order to test the hypothesis for the causal effect of risk perception on employees' performance, risk perception has significant and direct effects on employees' performance. However, the hypothesis was supported. Finally, the concept 'risk perception' does influence the connection between the employees' performance and work environment satisfaction. Because all the three propositions are significant, the type of mediation used here is called "partial mediation," because the direct effect of work environment satisfaction on employees' performance is still significant after the risk perception was included in the model, even though the beta coefficient for work environment satisfaction was reduced from 0.324 to 0.308 in Figure 4-3. In Figure 4-6, work environment satisfaction has a substantial direct impact on the employees' performance in this instance, as well as a significant indirect effect on the employees' performance through the mediator variable, risk perception.

4.6.2.3 The Result of the Hypothesis Testing

The model results are summarized in Table 4-16 and Table 4-17 thus:

Table 4-16: The Results of Hypothesis Testing for Respected Direct Path Analysis

Hypothesis Statement	Estimate	P-Value	Result On Hypothesis
H_1: There is significant difference in employees' risk perception and their performance among staff of Skikda oil refineries in Algeria	0.126	0.029	Supported
H_2: There is significant difference in the effect of work environment satisfaction and employees' performance among staff of Skikda oil refineries in Algeria.	-0.324	.000	Supported
H_3: There is significant difference in employees' risk perception level and work environment satisfaction among staff of Skikda oil refineries in Algeria	-0.163	.003	Supported

Table 4-17: The Summary Results of Hypothesis Testing for Mediated Path Analysis

			Estimate	**P-value**	**Result**	**Result on hypothesis**
employees' Performance	<---	*Env_Satisfaction*	-0.308	0.000	significant	Partial mediation
Risk Perception	<---	*Env_Satisfaction*	0.128	0.027	significant	
employees' Performance	<---	*Risk_Perception*	-0.124	0.019	significant	

From the result above, hypothesis H1 to H3 are significant and supported. Hypothesis H4 showed partial mediation between the risk perception and the relationship between work environment satisfaction and employees' performance among staff of Skikda oil refineries in Algeria.

4.7 Chapter Summary

Chapter 4 explained how the data was analyzed, including data cleaning, coding, and screening. On the model, the profile features of respondents were given. Finally, the SEM was utilized to figure out what factors influence the employees' risk perception and their performance. The data was checked for reliability and validity in the initial round of the study. In the following analysis, only items that met the necessary criteria was considered. The items loading must be at least 0.5, the composite reliability values must be more than 0.7, and the AVE value must be at least 0.50. The data was then utilized to test the hypotheses that had been established. All of the model's assumptions were found to be true. The last chapter presented the results of the study, their implications, limitations, and recommendations for further research.