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FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

DEPARTMENT OF ENVIRONMENTAL SCIENCE

Occupational health and safety knowledge, attitudes and practices of employees at an energy parastatal: Case of ZPC Munyati power station, Zimbabwe

By

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A research project submitted in partial fulfillment of the requirements of a Bachelor of Environmental Science Honours degree in Safety, Health and Environmental management

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Declaration

I, Nicole G Miruka (B190525B), declare that the this study entitled “Occupational health and safety knowledge, attitude and practices of employees at an energy parastatal in Zimbabwe” is my own work and has not been submitted in whole , or in part, for another degree in any institution.

I declare that the information cited from the published and unpublished work written by others has been acknowledged in the text and a bibliography has been provided.

Signature of the student:  Date: 29 May 2023

Signature of supervisor:  Date: 30 May 2023

Dedication

This special dedication to my parents and my sisters who are always there to support, care and love me in my life.

Acknowledgements

First and foremost, l owe my supervisor Dr. Kanda, a debt of gratitude for the continuous support and guidance in making this project a success. He helped me with the necessary skills in writing this dissertation and sacrificed his precious time in order to achieve the completion of this research project. Your unfailing help Dr. Kanda, wisdom, commitment and advice will be forever be cherished and unforgettable. Thank you always for your unwavering support, guidance and mentorship throughout the period of my study.

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Abstract

Background of study: Continuous improvement in occupational health and safety (OHS) has substantial reductions accidents and work-related disease. The energy industry is key to national economic development but has high incidences of occupational accidents and ill-health.

Aim: To determine knowledge, attitudes and practices (KAP) of employees for OHS at energy parastatals in Zimbabwe.

Methodology: A cross-sectional descriptive survey was conducted using a pre-tested questionnaire administered to 223 randomly selected employees from six departments at ZPC between March and April, 2023. Descriptive statistics were used to summarise the characteristics of participants. Scoring method was used in determining the levels of KAP. Further analysis was done to determine the association between demographic information and KAP using a Chi-square test.

Key findings: Respondents had good knowledge (mean score =75.3%), moderate attitude (mean score = 61.8%) and moderate practices (mean score = 38.2%) towards OHS using Blooms cut off points. There was significant association between age, and the level of education of the participant with knowledge ($p < 0.05$).

Conclusion: The study indicated acceptable knowledge, attitudes and practices of employees for OHS with potential room for continuous improvement. The KAP of employees towards OHS may be influenced by the individual characteristics suggesting the need for interventions targeting individual behaviour change.

Key terms: energy sector; parastatal, occupational safety, Zimbabwe

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CHAPTER 1: INTRODUCTION

1. INTRODUCTION

1.1 Background of the study

More than 4.3 million work-related premature deaths and diseases are due to health and safety globally (Molewa, 2021). These have been attributed to inadequate safety policies, standards and accountability systems in developing countries (Simukonda, 2019). Continuous improvement in occupational health and safety (OHS), through safety legislation and programmes (Molewa, 2021), has been observed to result in reduced illnesses work-related diseases globally (Awolusi, 2019). However, recurring OHS threats and related risks are introduced by technological advances and the structure of work (Awolusi, 2019).

The energy industry (e.g. coal, petroleum and electric power) plays an important role in economic development (National Renewable Energy policy, 2019). It has been a backbone to Zimbabwe`s economic development (Chen et al., 2022) but characterised by high incidence of safety accidents and occupational diseases. Many sectors (mining, construction and manufacturing) have conducted the knowledge, attitude and practices (KAP) surveys on OHS focusing on safety and health hazards, dust types and general occupational health and safety management (Nasab et al.2009; Aluko et al.2016; Noko et al.2022). Most manufacturing and producing of goods and services in the energy sector lack all-inclusiveness in OHS programme leading to incidence rates (Makhamara et al., 2016).

A parastatal is an organisation which is not an integral part of the government by includes an institution, organisation or agency which is wholly or substantially financed or owned and controlled by the government (Chilunjika & Mutizwa, 2019). Munyati Power Station (MPS) is a small thermal power station owned by ZESA`s subsidiary. Zimbabwe Power Company (ZPC). Previous studies have shown that accidents at the workplace have been reported more frequently, focusing mainly on non-fatal occupational injuries, and the epidemiology of the accident and impact of OHS across the energy sector (Mukhtar, 2020). Therefore, the study wishes to determine the level of KAP of employees on OHS.

1.2 Problem statement

The global economic recession has caused various industrial organisation to experience diverse OHS challenges (Maumbe, 2017). This has locally resulted in insufficiently managed necessary OHS standards and regulations which could influence KAP of workers. Unlike private organisations, parastatals appear to be characterised by poor management systems (Musabayana et al. 2021) and increasing incidences of accidents due to reduced OHS initiatives since the hyperinflation for the last decade in Zimbabwe (Jerie & Mandebere, 2019). It appears there are few published independent evaluations for KAP of workers on OHS in parastatals, particularly the energy industry, and for Zimbabwe. Despite having written standards, polices and regulations at the organisation, accidents still occur. The current study assessed KAP of employees on OHS issues.

1.3 Aim and specific objectives

1.3.1 Aim

To determine OHS KAP practices at energy parastatal in Zimbabwe

1.3.2 Specific objectives

- To determine the levels of KAP of employees on OHS at an energy parastatal in Zimbabwe
- To determine the association between demographic information of workers and KAP on OHS.

1.4 Significance of the study

The study will provide an independent evaluation of KAP at an energy parastatal in Zimbabwe to augment internal evaluations. It will highlight key research and training needs, KAP of workers to help in planning to reduce risks and make recommendations for continual improvement in having a safety culture. The findings of this study will add on to literature on KAP of workers on OHS in the energy sector and be used as point of reference in future work.

1.5 Research questions

- What OHS practices are in place at Munyati Power Station?
- What are the KAP of workers on OHS at the organisation?

1.6 Assumptions

- Research data will be made readily available
- Workers will be earnest to provide unbiased information
- The data collection tool(questionnaire) will collect the needed information

1.7 Limitations

- Access to organisational OHS data may be restricted
- The questionnaire may not collect information regarding why workers think the way they do, requiring another tool to augment it.

- Data collection is subject to approval by the organization's management

1.8 Delimitations

- Evaluation of KAP of workers on OHS at Munyati Power Station
- Representative samples of workers (different departments) will be involved in the study

CHAPTER 2. LITERATURE REVIEW

2. LITERATURE REVIEW

2.1 Introduction

The chapter reviewed related literature sources on KAP of workers on OHS in the energy industry. The chapter highlights the importance of OHS in workplace and the potential risks associated with poor OHS practices, particularly in the energy sector.

2.2 Common hazards and risks in the energy sector

The ILO (2023) shows rising estimation of around 340 million occupational accidents and 160 million victims of work-related illnesses annually worldwide. The national annual report revealed that about 89 workers were seriously injured and 11 with pneumoconiosis in the electricity production by the year (Yon et al., 2021). Jerie and Mandebere (2019) assessed the effectiveness of OHS management systems in accident prevention at ZESA enterprises in Zimbabwe. The most common hazards identified at ZESA included improper work organization, poor hygiene, ergonomic hazards, fire, and electric hazards which can reduce productivity of the organisation.

Kalte et al. (2014) reported that electrical burns has contributed to a significant number of accidents that lead to death. Coal mine workers face the looming perils of potential falls of volatile rocks, ergonomic problems caused by bending and lifting heavy objects in their daily work, the challenges caused by inhaling coal mine dust which can cause coal workers`

pneumoconiosis (CWP) and a plethora of other hazards in both underground and open cast mines in daily basis (Mavhunga, 2018).

2.3 OHS in the energy industry, Zimbabwe

Jerie (2012) indicated that Zimbabwe adopted conventions that include C155 OHS and C161 occupational health services. In terms of national laws that cover OHS, he singled out that the Statutory Instrument 68 of 1990 , Factories and Works Act of 1976 , Mines and Minerals Act and many more ca be used as guidance in bringing out a good occupational health and safety management system.

Maumbe (2017) revealed that the basics of ZETDC`s OHS system was based on the need to reduce loss of work hours and increased rat of labour turnover due to the risky nature of electricity transmission and distribution. Institutional and policy frameworks were identified to enable for the implementation of OHS system in ZETDC. Various activities were noted for the promotion of OHS which included safety pledge, change of culture, OHS awards, SHE committee, safety awareness campaigns, corporate level reports, SHE workshops and seminars.

2.4 Evaluating the performance of a OHS system at an organisation

In the study done by Omweri (2019) on the effect of OHS practices on performance of building construction industry in Nakuru Country, Kenya, training, emergency response planning, occupational control mechanisms and workplace inspections were shown to affect performance of building construction industry in Nakuru, Kenya. A questionnaires was used for data collection.

Nyandoro & Nyawude (2017) highlighted on the evaluation of OHS and employee well-being in the public sector in Zimbabwe that provision of OHS programmes, training courses and presence of formal procedures for reporting accidents and injuries were used as indicators for evaluating OHS. Self –administered questionnaires were used to collected data

2.5 Knowledge, attitudes and practices (KAP) of workers towards OHS

Mukhtar et al (2020) studied the knowledge, attitude and practice on OHS among workers at petrochemical companies. The questionnaires were used as the data collection tool by distributing them to the participants. The results showed that majority of the participants had high level of knowledge, positive attitude and fair practices towards OHS at the organization.

Similarly, Mohamed et al (2018), also did a research on the assessment of knowledge, attitude and practice of petroleum station workers towards adverse health effects of their activities, Khartoum State. The target population was workers with work experience of more than six months at the organization using a questionnaire. Results showed that workers had good knowledge, positive attitude and good practice..

2.6 Common OHS challenges faced by the energy sector

Maumbe (2018) noted that OHS remain unattended to in African economies due to a rise in competing regional and sector issues and challenges. African economies are highly affected by poverty and poor performance in OHS These include lack of serious OHS culture, little understanding of OHS legislation and to attain adequate OHS education and trainings.

Jerie & Mandebere highlighted that due to the raising of occupational safety and health standards to international levels in each economic sector, the monetary value continue to rise

as well leading to poor implementation and commitment of OHS issues. This is evidenced by Mubayana et al (2021) highlighting poor funding of OHS initiatives (defective machines, inadequate personal protective equipment and lack of knowledge in safety and health).

2.7 OHS challenges in the energy sector: parastatal

Jerie and Mandebere (2019) highlighted that most parastatals lack full implementation of OHS systems and is evidenced by re-occurring of hazards of ZESA enterprises. Maumbe (2017) also revealed that the occupational health and safety systems at ZETDC suffers shortage of OHS personnel, constrained budgeting and financing, behavioural and negligence tendencies and foreman`s dual responsibility with trade unions. Reorientation, expansion of OHS and safety policy were recommended.

2.8 Summary

Literature appears mainly focused on general performance, factors influencing, hazards, and challenges towards OHS while few studies pay attention to KAP at the energy sector.

CHAPTER 3. METHODS AND MATERIALS

3. METHODS AND MATERIALS

3.1 Description of the study area

The study was conducted at Munyati Power Station (18º39`18”S; 29º46`54”E) in Zimbabwe (Fig 3.1). Munyati Power Station is a five-unit coal fired power plant with a total generation capacity of 100 MW. It is owned by Zimbabwe Electricity Supply Authority (ZESA). Coal is transported from Hwange Colliery and water from Munyati and Sebakwe Rivers. Munyati Power Station has a staff complement of 403 employees found in six departments.

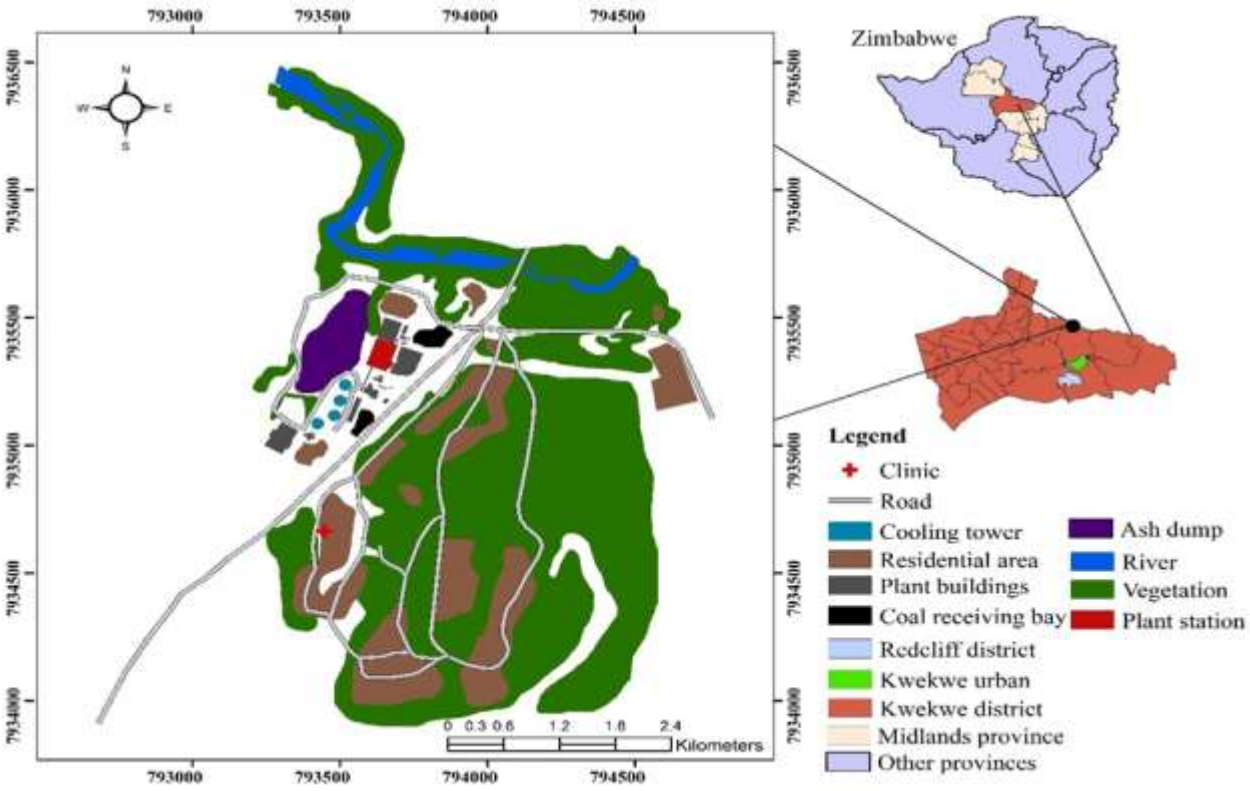

Fig 3.1: A detailed map showing the location of ZPC Munyati Power Station.

3.2. Research design

A cross-sectional descriptive survey was used for the study. It was chosen because it is relatively inexpensive and it captures multiple variables at the same time as many findings and outcomes are gathered and analysed to create new assumptions (Kumar, 2018).

3.3 Conceptual framework: Heinrich theory

Heinrich`s philosophical framework (Heinrich, 1931) sees individual employees rather than working conditions as the primary cause of accidents in the workplace (Fig. 3.2) (Samson et al, 2021). The theory can be applied to understand the relationship between worker behavior and occupational health and safety. Specifically, the theory suggests that worker`s attitudes and behaviours towards safety can be indicators of the likelihood of accidents and injuries occurring in the workplace.

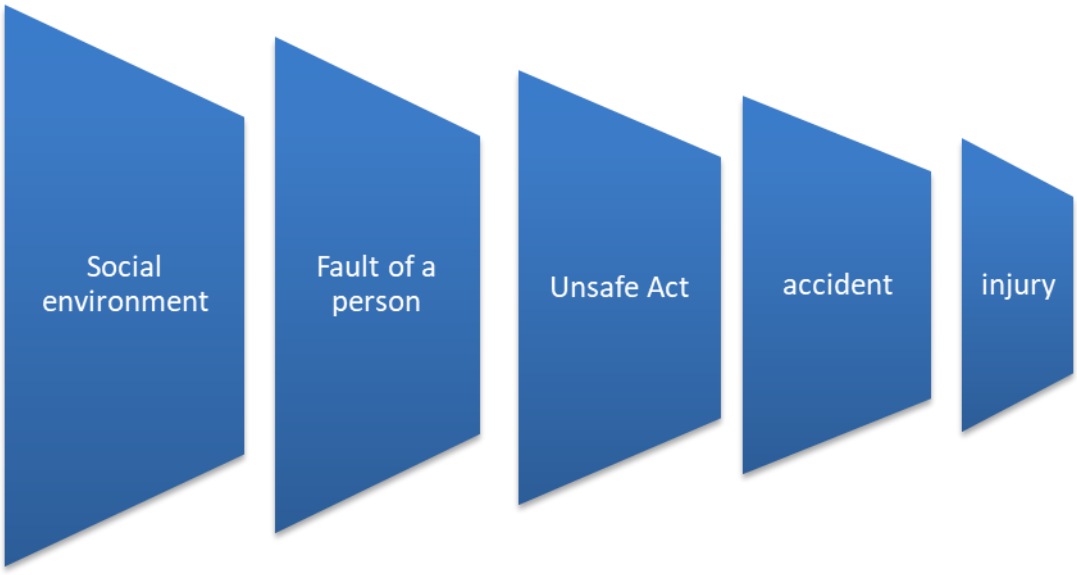

Fig. 3.2. Heinrich theory (Modified from Heinrich, 1931)

3.4 Determination of sample size and recruitment of participants

3.4.1 Determination of sample size

The study area has a population size of 403 employees. The sample size was determined using Yamane`s (1994) formula as described by Samson (2016) and Bett et al. (2019):

$n = N/1+N\ (e)^2$

Where n = sample size

N= Population (403)

e= error margin or margin of error (0.05)

Substituting the figures in the formula, gives:

$=403/1+403(0.05)^2$

= 201

The sample size for this study was 201. Further for nadj (n adjusted) for non-respondence of 10%:

Nadj = n/0.9

= 201/0.9

= 223

3.4.2 Recruitment of research participants

The study employed the use of stratified random sampling. It allows randomly picking participants without subjective measures, which also gives room for positive conclusion (Aluko et al., 2016). It involves dividing the population into sub-groups that share the similar characteristics and individuals are randomly selected from each group (stratum). The sampling technique was used to ensure complete worker representation by involving all departments at the station and make sure each department participates (Katsuro et al., 2019).

Munyati Power Station has six departments (strata) shown in Table 3.1. The calculated sample size (223) was proportionally allocated to the departments. The number of employees selected in a department was determined as: number of participants in the department divided by population of that department multiplied by the calculated sample size (Table 3.1). The eligibility criteria for an employee to participate in the study included one who was permanent/contractor/casual/apprentice/attaché/trainee plant operator working from 8.00_a.m. to 4.30_v p.m., who were able to read and understand, and who the management approved to participate in the survey (Ngah, 2022).

Table 3.1 Calculation of sample size and its distribution among departments

Department	Department (N)	Sample size (n)	% sampling intensity
Operations	135	75	55.56
Safety, Health and Environment	13	7	53.85
Maintenance	140	77	55
Loss Control	36	20	55,56
Human resources	37	20	54,04
Finance	44	24	54,55
Total	403	223	328.56

3.5 Ethical considerations

Before giving their consent to participate in the study, participants were briefed that all information would be gathered anonymously and handled confidentially (Ricco et al., 2017). Participants were asked to voluntarily consent to participate in the study after an explanation of the background of the study. They were also told the risks and benefits of participating in the study. The participants' involvement in the study was a voluntary nature as there were no incentives, financial or other reward for participating in the study. In addition, participants were at liberty to with draw from the study at any time without any costs or penalties (Chikono, 2017). Permission to conduct the study was granted verbally on the 20th of April 2023 from the management of the organisation. The study was approved by Bindura University of Science Education through the department of Environmental Science by the issue of an official letter by the chairperson of the department (Appendix 1).

3.6 Research instruments: Questionnaire

Primary data were collected by self-administering two closed-ended questionnaire to 223 participants (head of SHE department, and other employees). The survey questions were extracted and modified from literature (Boustras et al., 2015; Goh and Chua, 2015; Mwangangi, 2018; Hedjuk et al., 2019). A questionnaire was used in this because it allows reaching a large group of participants within a short time at reasonable cost (Omweri, 2018). The questionnaire administered to the SHE head consisted of two sections, one on demographic information and the second on occupational health, safety management systems (OHSMS) activities at the organization (Appendix 2). The questionnaires administered to the employees consisted of demographical information of the participants, and concerning OHS activities (Appendix 3). Completed questionnaires were scrutinized, sorted, and analyzed with the aid of simple percentages and frequency counts to answer each of the research questions.

3. 7 Validity and reliability

A pilot test (pre-testing) was done in order to improve in accuracy of the questionnaire and ensure subjects do not face any challenges in answering the questions (Charuma, 2012). The reliability test was performed on the factors in the questionnaire (Zakaria et al., 2019). It was used because the research instrument had more than two responses for the questions. The Cronbach`s alpha score was used to determine the internal consistency of the questionnaire with 0.777.

3.8 Data collection

Closed-ended questionnaires were distributed with the help of production supervisors during toolbox meetings. The immediate supervisors of the participants assisted in distributing questionnaires to their subordinates due to their allocation in different workstations especially those who work off site. The participants could take the exercise seriously because of the involvement of the fellow workmates (Katsuro et al., 2019).

3.9 Data management

Data were captured in Microsoft Excel and imported to SPSS version 20. Descriptive statistics were used to summarise the characteristics of participants. The levels of KAP were scored using the method described by Alam (2021) and Rad et al. (2014) as cited by Vivi et al. (2019). The scores for knowledge, attitude and practice were done by awarding marks (correct response = 1, wrong = don't know = 0) for each questionnaire item (Appendix 4). The association between demographic information and the KAP were analyzed using a Chi-square test.

CHAPTER 4. RESULTS

4. RESULTS

4.1 Characteristics of participants

Table 4.1 shows the demographic information of participants. The response rate for the study was 79.8%. The result show that about two-thirds of the respondents were males (61.8%), with 70.2% of them having attained tertiary education. Work experience of 1 – 5 years had the highest proportion of participants (38.8%).

Table 4.1 Summary of demographic information of respondents

Variable	Categories	Frequency	Percent
Age group (years)	16 - 25	57	32.0
	26 - 35	60	33.7
	36 – 45	36	20.2
	above 45	25	14.0
Gender	Male	110	61.8
	Female	68	38.2
Level of education	None formal	1	0.6
	Primary education	12	6.7
	Secondary education	40	22.5
	Tertiary	125	70.2
	8	146	82.0
Normal work shift	less than 8	19	10.7

(hours)	more than 8	13	7.3
Marital status	Single	84	47.2
	Married	86	48.3
	Divorced	6	3.4
	widow/ widowed	2	1.1
	less than 1 year	53	29.8
Work experience	1-5	69	38.8
(years)	6-10	20	11.2
	greater than10	36	20.2
Department	Safety Health and Safety	7	3.9
	Maintenance	62	34.8
	Human resources	14	7.9
	Operations	62	34.8
	Finance	21	11.8
	Loss control	12	6.7

4.2 Knowledge on OSH

Table 4.2 shows the knowledge of participants on OHS. Results indicate that 85.4% of the participant's knew the importance of hierarchy of control. About half of the participants (52.8%) knew whether the emergency procedure worked properly in case of a fire broke out. Overall, scoring showed that participants had good knowledge (mean score of 75.3%).

4.3 Attitude towards OSH

Table 4.3 shows the attitude of respondents regarding OHS. Results indicate that respondents 88.8% of the participants knew is responsible towards keeping the environment clean being everyone`s responsibility. Less than half of the participants (46.6%) are not aware of the uses

of the fire equipment. Overall, scoring showed that participants had moderate knowledge (mean score of 61.8%).

Table 4.2 Level of knowledge on OHS at Munyati Power Station

Statement	(1) Strongly disagree	(2)Disagree	(3)Neutral	(4)Agree	(5)Strongly agree	Overall score 4&5 overall score
K1. Reporting a near miss is important?	17 (9.6)	12 (6.7)	11 (6.2)	38 (21.3)	100 (56.4)	138 (77.5)
K2. I know the purpose of a pre-task risk assessments at my workplace.	3 (1.7)	13 (7.3)	14 (7.9)	78 (43.8)	70 (39.3)	148 (83.1)
K3. The hierarchy of controls are important for the organization.	2 (1.1)	11 (6.2)	13 (7.3)	96 (53.9)	56 (31.5)	152 (85.4)
K4. I know the hazards that are associated with the line of my work.	2 (1.1)	11 (6.2)	2 (1.1)	92 (51.7)	71 (39.9)	163 (91.6)
K5. Does the emergency procedure work properly in case a fire broke out?	9 (5.1)	22 (12.4)	53(29.8)	61(34.3)	33(18.5)	94(52.8)
K6. Occupational management systems are important for the organization	5 (2.8)	16 (9)	18 (10.1)	82 (46.1)	57 (32)	139 (78.1)

K7. Is it that a safety policy should only be known by the SHE department?	94 (52.8)	43 (24.2)	10 (5.6)	17 (9.6)	14 (7.9)	137 (77)
K8. I am aware of the cardinal rules of Safety of the organization	5 (2.8)	32 (18)	34 (19.1)	73 (41)	34 (19.1)	107 (60.1)
K9. I am aware of the safe work procedures such as work permits, pre-task risk assessment, etc.	3 (1.7)	16 (9)	9 (5.1)	105 (59)	45 (25.3)	150 (84.3)
K10. I am aware of the importance of mock drills at my workplace	18 (10.1)	24 (13.5)	27 (15.2)	65 (36.5)	44 (24.7)	109 (61.2)
Average(mean) score						**134(75.3)**

The numbers in the brackets are percentage of the frequency. Responses 4 and 5 (agree and strongly agree were the preferred ones except for question 7 with preferred score response 1 and 2 (strongly disagree and disagree).

Table 4.3 Summary of attitude towards occupational health and safety at ZPC Munyati power station

Statement	(1)Strongly disagree	(2)Disagree	(3)Neutral	(4)Agree	(5)Strongly disagree	Overall score 4&5
A1. Keeping the environment clean is everyone`s responsibility.	8 (4.5)	10 (5.6)	2 (1.1)	41(23)	117(65.7)	158 (88.8)
A2. PPE should be worn at all times at work	17 (9.6)	34 (19.1)	6 (3.4)	35 (19.7)	86 (48.3)	121 (68)
A3. Safety talks are necessary to be done everyday	14 (7.9)	59 (33.1)	18 (10.1)	50 (28.1)	37 (20.8)	87 (48.9)
A4. Mock drills are important to increasing safety culture	15 (8.4)	32 (18)	41(23)	51(28.7)	39(21.9)	90(50.6)
A5. Shortcuts safely complete work faster than SOPs	82 (46.1)	32 (18)	20 (11.2)	35 (19.7)	9 (5.1)	114 (64)
A6. Work permits are excellent ways to reduce accidents	18(10.1)	21 (11.8)	32 (18)	86 (48.3)	21 (11.8)	107 (60.1)

A7. Pre and periodic medical surveillance to all employees is important	13 (7.3)	17 (9.6)	43 (24.2)	58 (32.6)	47 (26.4)	105 (59)
A8. I feel reporting a near miss is a waste of time	56 (31.5)	31 (17.4)	15 (8.4)	48(27)	28 (15.7)	87 (48.9)
A9. SHEQ programs e.g. wellness programs are important for boasting morale	3 (1.7)	14 (7.9)	17 (9.6)	70 (39.3)	74 (41.6)	144 (80.9)
A10. The fire equipment can be used for other purposes.	52 (29.2)	31 (17.4)	48 (27)	35 (19.7)	12 (6.7)	83 (46.6)
Average score						**110 (61.8)**

The numbers in the brackets are percentage of the frequency. Responses 4 and 5 (agree and strongly agree were the preferred ones except for questions 5, 8 and 10 with preferred score response 1 and 2 (strongly disagree and disagree).

4.4 Practice towards OHS

Table 4.4 shows the practice of participants on OHS. The results indicated that majority of the participants (87.6%) report potential threats to working safely to their superiors. Not more than half of the participants (33.8), use appropriate PPE as required. The overall score showed that participants had moderate knowledge (mean score of 38.2%).

4.5 Association between demographic information and KAP

4.5.1 Knowledge and demographic information

Tables 4.5 shows the relationships between demographic information and knowledge (K1 – K10). Results show that there is significant association ($p < 0.05$) between knowledge and age group of the participant, except for K8 and K9 (Awareness on cardinal rules and safe work procedures such as permits respectively). The level of education was also significantly associated (<0.05) with knowledge, except for only K3 (the hierarchy of controls are important for the organisation). However department was not significantly associated with knowledge except for K10 (importance of mock drills at workplace.

4.5.2 Attitude and demographic information

Table 4.6 shows the relationship between demographic information and attitudes of participants. It indicates that there was low association in general as only 30% of the questions on attitudes had significant association ($p < 0.05$) with it for gender, age, level of education and work experience..

Table 4.4 Level of practices towards OHS

Statement	(1)Strongly disagree	(2)Disagree	(3)Neutral	(4)Agree	(5)Strongly agree	Total Score
P1. I always use the appropriate protective clothing as required	34(19.1%)	53(29.8%)	31(17.4%)	38(21.3%)	22(12.4%)	60(33.8%)
P 2. I know the location of fire extinguishers at my workplace	20(11.2%)	42(23.6%)	24(13.5%)	65(36.5%)	27(15.2%	(92)51.6%
P3. I do not use equipment that in my opinion pose a safety hazard	16(9%)	16(9%)	24(47.8%)	85(47.8%)	37(20.8%)	124(69.7%)
P4. I inform my superior about potential threats to working safely that l observe	3(1.7%)	12(6.7%)	7(3.9%)	87(48.9%)	69(38.8%)	156(87.6%)
P5. I always follow procedures for dealing with machine breakdowns or safety hazards	10(5.6%)	30(16.9%)	14(7.9%)	64(36%)	60(33.7%)	124(69.7%)
P6. I notify my superiors in the event of an accident at work even minor one	36(20.2%)	53(29.8%)	25(14%)	38(21.3%)	26(14.6%)	64(36%)

P7. I always report every potential hazard that I encounter at workplace	38(21.3%)	48(27%)	30(16.9%)	46(25.8%)	16(9%)	62(34.9%)
P8. I always do not engage in any activity that can put me or any of my colleagues in danger	24(13.5%)	40(21.7%)	40(21.7%)	42(22.8%)	32(18%)	74(41.6%)
P9. I at times take risks so that I can finish work on time	55(30.9%)	52(29.2%)	32(18%)	26(14.6%)	13(7.3%)	107(60.1%)
P10. I never miss my health check ups	15(8.4%)	40(22.5%)	40(22.5%)	60(33.7%)	23(12.9%)	100(56.2%)
Average(mean) score						**68(38.2%)**

The numbers in the brackets are percentage of the frequency. Responses 4 and 5 (agree and strongly agree were the preferred ones except for question 9 with preferred score response 1 and 2 (strongly disagree and disagree).

Table 4.5 Relationship between demographic information and knowledge

Characteristic	Chi square p-value									
	K1	K2	K3	K4	K5	K6	K7	K8	K9	K10
Department	(0.192)	(0.322)	(0.401)	(0.071)	(0.578)	(0.621)	(0.775)	(0.060)	(0.298)	**(0.011)**
Age group	**(0.010**)	**(0.010)**	(**0.007**)	(**0.016**)	(**0.009**)	**(0.016)**	**(0.001)**	(0.096)	(0.076)	(**0.001)**
Gender	(0.738)	(0.259)	(0.134)	(0.077)	(0.395)	(0.783)	**(0.038)**	**(0.003)**	**(0.015**)	**(0.000)**
Level of education	**(0.000)**	**(0.006)**	(0.141)	**(0.002**)	**(0.001)**	**(0.002)**	**(0.001)**	(**0.002)**	**(0.002)**	**(0.010)**
	(0.069)	**(0.001)**	(0.143)	(0.101)	(0.055)	(0.820)	(**0.001)**	(0.344)	**(0.003)**	**(0.007)**

Figures in **bold** denote significant association ($p < 0.05$)

Table 4.6 Relationship between demographic information and attitudes

Characteristic	Chi square p-value									
	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Age	**(0.007)**	**(0.003)**	**(0.014)**	(0.097)	(0.111)	(0.300)	(0.365)	(0.365)	(0.132)	(0.785)
Level of education	**(0.024)**	**(0.005)**	(0.060)	(0.151)	(0.142)	**(0.001)**	(0.094)	(0.164)	**(0.000)**	(0.327)
Gender	(0.213)	(0.155)	(0.619)	(0.017)	**(0.040)**	(0.217)	**(0.041)**	(0.455)	(0.392)	(0.613)
Work experience	**(0.026)**	(0.080)	(0.251)	(0.836)	(0.220)	**(0.001**)	(0.155)	(0.911)	**(0.004**)	(0.564)

Figures in **bold** denote significant association ($p < 0.05$)

4.5.3 Practices and demographic information

Table 4.7 shows the relationships between practices and demographic information of participants. Results suggest that practices were poorly associated with demographic information with only 30% of the questions on practices being significantly associated ($p < 0.05$) with practices for variables; age, work experience and the department. The participant's level of education appeared significantly associated with 60% of the questions on practices ($p < 0.05$).

Table 4.7 Relationship between demographic information and practice

	Chi square p-value									
Characteristic	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
Age	(0.369)	(0.675)	**(0.032)**	**(0.000)**	**(0.025)**	(0.411)	(0.428)	(0.283)	(0.480)	**(0.000)**
Level of education	**(0.036)**	**(0.001)**	(0.157)	**(0.035)**	**(0.002)**	**(0.024)**	(0.204)	(0.576)	(0.139)	**(0.018)**
Work experience	(0.928)	(0.255)	**(0.000)**	**(0.001)**	**(0.025)**	(0.207)	(0.376)	(0.097)	(0.586)	(0.360)
Department	(0.399)	(0.571)	(0.333)	(0.479)	**(0.000)**	**(0.003)**	(0.977)	(0.432)	(0.055)	**(0.039)**

Figures in **bold** denote significant association ($p < 0.05$)

CHAPTER 5. DISCUSSION

5. DISCUSSION

The response rate was 79.8%. Some of the participants did not return completed questionnaires for one reason or another. The Cronbach alpha value of the questionnaire which was an acceptable reliability score (Heale, 2015)

5.1 Knowledge of participants towards OHS

The primary aim of any OHS programme is to prevent accidents and illnesses (Francis et al., 2017), for which an employee`s knowledge is important (Ibrahim et al., 2017). The findings of the present study indicated that the majority of the participants had good knowledge towards OHS practices. This could be explained that almost three-quarters (70.2%) of them had attained tertiary education. Most of the participants were between 16 to 25 years of age. This is where the cognitive responses are still active (Noko, 2019) such that participants were even aware of the hazards at their workplace.

Earlier studies have reported similar findings that participants had good knowledge of OHS in various settings including wood and metal work (Esaiyas et al., 2018), among health workers (Aluko et al., 2016; Osman et al., 2022), and coal miners (Mavhunga, 2018).

5.2 Attitudes of participants towards OHS

On overall, participants had a moderate attitude towards OHS practices at the energy organisation. This could be demonstrated by their unwillingness to do safety talks on a daily

basis. Safety talks may help increase awareness and knowledge (Katsuro et al., 2019). Further, participants felt that reporting incidences was a waste of time. However, this could help prevent the occurrence of real accidents that may causes injuries and fatalities (Aluko et al., 2016).

Some studies indicated that workers had positive attitude towards OHS (e.g., Aluko et al., 2016; Mavhunga, 2018; Zakaria et al., 2019). These reports appear to be slightly different from the moderate attitude towards OHS found in his study, possibly, for the majority of participants had tertiary education. A similarly study done on an energy parastatal indicated that most of the participants had positive attitude while a few were neutral attitude on OHS (Mukhutar, 2020). However, some studies argue that despite having high knowledge among petroleum workers, the practices tend to be poor, hence thus knowledge may not obviously result in positive attitude or good practice (Mohamed et al., 2018).

5.3 Practices of participants towards OHS

The study revealed that workers did not report near misses and accidents unless they were major ones. This could be because they feel stigmatised with the questioning through accident investigations (Katsuro et al., 2019). Overall, practices towards OHS were found to be moderate, nearly close to poor. This finding is quite confusing in that the same workers who are well educated and knowledgeable had moderate attitudes and nearly poor practices. A possible explanation could be lack cause-effect relationship between knowledge and practices alluded to above.

5.4 Association between demographic information and KAP

Results of the present study indicated that there was a significant association between levels of education, age and knowledge of the participant. A similar finding was reported by Nasab et al. (2009). Attitudes and practices were not significantly associated with the demographic characteristics of participants. Ibrahim (2017) observed that there was no statistical significant association between age, marital status, education, working experience with total score of attitude.

CHAPTER 6. CONCLUSION AND RECOMMENDATIONS

6. CONCLUSION AND RECOMMENDATION

6.1 Conclusion

Participants had good knowledge, moderate attitude and moderate practices (nearly poor) regarding OHS at the energy parastatal. This demonstrated some acceptable safety culture but requiring continual improvement, particularly at the individual level for behaviour change (attitudes and practice). Training may help to modify human behaviour. The association between knowledge and demography could be investigated further to inform training of participants. The study provides an external evaluation of KAP towards OHS in a parastatal which does not get much research attention when compared to the private sector. Further work may be done to investigate the safety culture at the parastatal.

6.2 Recommendation

- Training workers in OHS after a detailed needs assessment throughout departments

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APPENDICES

Appendix 1

DEPARTMENT OF ENVIRONMENTA SCIENCE

Bindura University of Science Education

Bag 1020 **BINDURA, Zimbabwe**
Tel: 263 - 71 – 6505
Cell :0778371588
Email : vamugure@gmail.com

BINDURA UNIVERSITY OF SCIENCE EDUCATION

3 April 2023

Dear Sir/Madam

REQUEST FOR PERMISSION TO COLLECT DATA FOR ACADEMIC RESEARCH PROJECT

PROJECT TITLE: ***An analysis on OHS practice at Munyati power station***

ACADEMIC SUPERVISORS: Mr. A. Kanda

This letter serves to inform you that **Miruka Nicole, G. Registration Number (B190525B)** is a fourth year student at Bindura University of Science Education, in the Department of Environmental Science. During her fourth year of study she is supposed to do a research project in her area of specialisation.

Please assist in any possible way. Data collected will be used for academic purposes only and will not be published without your prior consent.

Thank you for your assistance.

Yours faithfully

Mr T. Nyamugure
DEPARTMENT OF ENVIRONMENTA SCIENCE

CHAIRPERSON
Department Of Environmental Science
Faculty Of Agriculture And Environmental Science
Bindura University Of Science Education
P. BAG 1020, BINDURA
ZIMBABWE
OFFICIAL

Appendix 2

BINDURA UNIVERSITY OF EDUCATION SCIENCE

FACULTY OF AGRICULTURE SCIENCE AND ENVIRONMENTAL

Questionnaire ID: 1

OHS Questionnaire for the head of SHERQC department

My name is Miss Nicole G Miruka from the Environmental Science department at Bindura University of Science Education. I am conducting a survey at Munyati for learning purposes in fulfillment of my final year dissertation.

The title of the study is *"Occupational health and safety knowledge, attitudes and practices of employees at the energy parastatal in Zimbabwe"*. The survey is about knowledge, attitude and practices (KAP) of workers to OHS practices at an organisation. It is expected to contribute to finding the level of knowledge, attitude and practices associated with OHS practices at a parastatal subsidiary like Munyati Power Station. Your voluntary participation is needed by completing the questionnaire.

Organisation: ……..

Date: ……...

Instructions to Respondent

Cross/ tick/strike the appropriate number corresponding to your response

Part A: General Information

1. Age in years?

   1 16-25 years **2** 26-35 years **3** 36-45years **4** 46-65 years

2. Gender :

   1 Male **2** Female

3. Highest level of education completed

   1 None formal **2** Primary **3** Secondary **4** Tertiary

4. Marital status:

   1 Single **2** Married **3** Divorced **4** widowed/ widower

5. Religion :

   1 Traditional **2** Christianity **3** Islam **4** Others

   If any other, please specify

   ……

Part B: OHS management activities:

The following items refer to accident/ incident prevention activities. Answer using numbers considering whether they were developed or not in your organisation (**1** Yes **2** No)

6. The organisation has an OHS policy?
7. OHS goals were set for the organisation
8. Workers are provided with adequate personal protective equipment
9. There is an accident recording system
10. Information about risks that workers may be exposed to is provided
11. There is a written pre-task risk assessment form for workers
12. Workers are provided with OHS training
13. Proper medical surveillance is there?
14. Standard operating procedures or specific safety instructions relevant to its operation were prepared and are available?
15. Is the organisation certified to any international OHS standards?
16. Does the organisation do any safety programmes e.g SHEQ rallies?
17. Is there a functional workplace health and safety committee?
18. Is there an organizational OHS management system manual or plan?

Appendix 3

BINDURA UNIVERSITY OF SCIENCE EDUCATION

FACULTY OF AGRICULTURE AND ENVIRONMENTAL SCIENCE

Questionnaire ID: 2

OHS Questionnaire for General Employees

My name is Miss Nicole G Miruka from the Environmental Science department at Bindura University of Science Education. I am conducting a survey at Munyati for learning purposes in fulfillment of my final year dissertation.

The title of the study is *"Occupational health and safety of knowledge, attitudes and practices at the energy parastatal in Zimbabwe"*. The survey is about knowledge, attitude and practices (KAP) of workers towards OHS at an organisation. It is expected to contribute to finding the level of knowledge, attitudes and practices associated with OHS practices at a parastatal subsidiary like Munyati Power Station. Your voluntary participation is needed by completing the questionnaire.

Department: ……..

Date: ……...

Instructions to Respondent

Cross/ tick/strike the appropriate number corresponding to your response

Part A: Demography Information

1. Age group (years) :

   1 16-25 **2** 26-35 **3** 36-45years **4** Above 45

2. Gender :

   1 Male **2** Female

3. What is your level of education?

   1 None formal **2** Primary education **3** Secondary education **4** tertiary

4. What is the duration of a normal work day or shift (hours)?

   1 8 **2** Less than 8 **3** More than 8

5. What is your marital status?

   1 Single **2** Married **3** Divorced **4** Widow/ Widowed

6. How long have you been employed with the organisation (years)?

   1 Less than 1 **2** 1-5 years **3** 6-10 **4** greater than 10

B: Knowledge

Use the following 5- point Likert scale to answer questions in parts B, C and D: **1** Strongly disagree, **2** Disagree, **3** Neither agree nor disagree, **4** Agree, **5** strongly agree. Use Numbers **ONLY** to answer.

	Number
7. Reporting a near miss is important	
8. I know the purpose of pre-task risk assessment at my work place?	
9. The hierarchy of controls important for the organisation?	
10. I know hazards that are associated with the line of my work	
11. Does the emergency procedure work properly in case a fire break out?	
12. Occupational management systems are important for the organisation	
13. Is it that safety policy should only be known by the SHE department only?	
14. I am aware of the cardinal rules of Safety at the organization	
15. I am aware of the safe work procedures such as permits, pre-task risk assessment	
16. I am aware of the importance of mock drills at my workplace	

C. Attitude towards OHS

	Number
17. Keeping the environment clean is everyone`s responsibility	
18. PPE should be worn at all times at work	
19. Safety talks are necessary to be done everyday	
20. Mock drills are important to increasing safety culture	
21. Shortcuts safely complete work faster than SOPs	
22. Work permits are excellent ways to reduce accidents	
23. Pre and periodic medical surveillance to all employees is important	
24. I feel reporting a near miss is a waste of time	
25. SHEQ programs e.g wellness programs, campaigns, e.t.c are important to boasting morale	
26. The fire system can be used for other purposes like boiler cleaning	

Part D: Practice of OHS

	Number
27. I always use the appropriate protective clothing as required	
28. I know the location of the fire extinguishers at my work environment	
29. I do not use equipment that in my opinion may pose a safety hazard	
30. I inform my superiors about potential threats to working safely that l observe	
31. I always follow the procedures for dealing with machine breakdowns or safety hazards	
32. I always notify in my superiors the event of an accident at work- even minor one	
33. I always report every potential hazard however that l encounter at workplace	
34. I always do not engage in any activity that can put me or any of my colleagues in danger	
35. I at times take risks so that I can finish work on time	
36. I never miss my occupational health check ups	

Appendix 4

Appendix 4: Scoring and level of knowledge, attitude and practice cut off points.

Variable	No. of questions	Score to answers	Level of variables (%)
Knowledge	10	1 = correct 0 = wrong/ don`t know	Poor = 0 - 1.7 (0 - 33) Moderate = 1.8 - 3.4 (34 - 67) Good = 3.5 - 5.0 (68 - 100)
Attitude	10	1 = correct 0 = wrong/don`t know	Poor = 0 - 2.3 (0 - 33) Moderate = 2.4 - 4.8 (34 - 67) Good = 4.9 - 7.0 (68 - 100)
Practice	10	1 = good practice 0 = poor practice/don`t know	Poor = 0 - 1.3 (0 - 33) Moderate = 1.4 - 2.7 (34 - 67) Good = 2.8 - 4.0 (68 - 100)