

EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A COAL MINE IN MPUMALANGA PROVINCE

**A research report submitted to the Faculty of Health Sciences,
University of the Witwatersrand, Johannesburg
in partial fulfilment of the requirements for the
degree of Master of Science in Nursing**

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DECLARATION

I, Lindiwe Betty Matshingane, declare that this research is my own work. It is being submitted for the Degree of Master of Science in Nursing at the University of the Witwatersrand, Johannesburg. It has not been submitted previously for any other examinations at this university or any other university.

Signature: 
Lindiwe Betty Matshingane

Date: 24/10/2017

DEDICATION

This research report is dedicated to my God, the author and the finisher of all things. His love endures forever. I could not have made it without you my Lord. I give you honour and praises!

This study is also dedicated to my children Khotso, Ayanda and Asanda. Thank you for your support and understanding throughout my studies. Leaving you alone at home to pursue my dream was not an easy thing to do. Thank you for your words of encouragement, prayers and laughter!

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- A special thank you goes to all the women who participated in this study; may God richly bless you all.
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ABSTRACT

Introduction: Underground mining is a male-dominated occupation. It usually involves hard labour in dark and damp environments with high temperatures. These factors pose unique challenges for women.

The official integration of women into mining in South Africa only commenced in 1996. Before this, women were prohibited from going underground. There were two important facilitating factors. Firstly, the new constitution of the Republic of South Africa (RSA, 1996) aimed to promote gender equality in society and in the workplace. Secondly, the Mine Health and Safety Act (Act 29 of 1996) and the Mining Charter (2004) were adopted; both of these acts advocated for including more women and advancing their careers as part of the empowerment of historically disadvantaged South Africans in the mining and minerals industry, citing a goal of '10 percent of women participation in the mining industry within 5 years' (i.e. 2009). It is in this context that the researcher sought to develop an understanding of the experiences of women working underground, specifically in a coal mine in the Mpumalanga province, South Africa.

Research design: A qualitative, contextual, exploratory and descriptive research design was used to explore and describe the experiences of women working underground at the [REDACTED] coal mine in the Mpumalanga province.

Methods: The study population consisted of all women working underground at [REDACTED] coal mine 1 (N=60). One-on-one in-depth interviews were conducted using a semi-structured guide with a purposively selected sample (n=22) of the women working underground.

Data analysis: Thematic content analysis was used to analyse data. Data analysis was conducted concurrently with data collection to facilitate constant comparison of the emerging themes.

Results: Five themes and fourteen sub-themes emerged from the data analysis process. The results show that some women are happy and proud to be working underground and they value the opportunity and the experience gained. However, although it is well over ten years since female miners started working underground in South Africa, not much has changed; they still face challenges regarding access to appropriate sanitation facilities and personal protective equipment and gear. Lack of personal development and training opportunities as well as lack of support from

supervisors and management also remain a challenge for women working underground. Women have shown willingness to learn from their male colleagues. Another finding was that women felt unfairly treated by management. They raised the issue that their wellbeing as females underground is not taken seriously. Women want to see themselves progressing with regards to their careers in mining but it seems as though the required training opportunities are still lacking or not available compared to those available for men.

Recommendations: Three main areas of concern specific to women should be addressed: health, safety and security, and cultural integration.

After gaining some understanding of the challenges faced by women working underground at coal mines, occupational health nurses should be able to advise and support mine management regarding any policies that affect women in mining, and they should be able to implement a risk- and gender-based medical surveillance programme to help deal with specific health needs of women employees.

A majority of women in the study voiced concerns about their safety underground. Women working underground face additional challenges because of their gender, especially when they are alone in dark areas. Mine management needs to address this issue and ensure that women are not exposed to dangerous situations that could lead to sexual abuse or even murder.

Gender diversity and mining occupational culture training sessions should help employees and management to understand and respect each other. Future research is recommended regarding the integration of women into the coal mining industry's male-dominated culture by means of appropriate support programmes.

Conclusions: Some progress has been made in terms of what has been done to meet the Mining Charter requirements, but some mining industries appear to simply want to meet the target of 10% without understanding that employing women underground involves specific responsibilities and changes to work processes and to administration. Female miners still face issues of safety and security, ill-fitting PPE, and poor skills development programmes. Therefore, understanding their concerns and their experiences of working underground likely provides valuable information to mine management regarding the systems they could implement to assist with integrating female workers into the male-dominated mining industry.

Key words/phrases: experience of women in mining, challenges faced by mine workers, women in mining, women in underground mining, coal mine, female workers.

ABBREVIATIONS USED

BCEA	–	Basic Conditions of Employment Act
DMR	–	Department of Mineral Resources
EEO	–	Equal Employment Opportunities
HRD	–	Human Resources Development
ICN	–	International Council of Nurses
ILO	–	International Labour Organisation
MHSA	–	Mine Health and Safety Act
MPRDA	–	Mineral and Petroleum Resources Development Act
PPE	–	Personal Protective Equipment
RSA	–	Republic of South Africa
WHO	–	World Health Organisation
WIM	–	Women in Mining

TABLE OF CONTENTS

CONTENTS	PAGES
DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
ABBREVIATIONS USED	vii
TABLE OF CONTENTS	viii
LIST OF TABLES	x
CHAPTER ONE	1
OVERVIEW OF THE STUDY	1
1.1 INTRODUCTION	1
1.2 BACKGROUND OF THE STUDY	1
1.3 PROBLEM STATEMENT	3
1.4 PURPOSE OF THE STUDY	4
1.5 RESEARCH OBJECTIVE	4
1.6 SIGNIFICANCE OF THE STUDY	4
1.7 PARADIGMATIC PERSPECTIVE	4
1.7.1 Meta-theoretical assumptions	5
1.7.2 Theoretical assumptions	6
1.7.3 Methodological assumptions	7
1.8 OVERVIEW OF THE RESEARCH METHODS	7
1.9 ETHICAL CONSIDERATIONS	8
1.10 ORGANISATION OF THE RESEARCH REPORT	8
1.11 SUMMARY	9
CHAPTER 2	10
LITERATURE REVIEW	10
2.1 INTRODUCTION	10
2.2 GLOBAL PERSPECTIVE ON WOMEN IN MINING	10
2.3 SOUTH AFRICAN PERSPECTIVE	11
2.4 CHALLENGES FACED BY WOMEN IN MINING	13
2.4.1 Physical and health challenges	13
2.4.2 Inadequate ablution facilities	14
2.4.3 Isolation	14
2.4.4 Equipment and personal protective equipment (PPE) challenge	14
2.4.5 Training opportunities and career advancement	15

2.4.6	Lack of respect for women working underground.....	16
2.4.7	Support from supervisors, colleagues and management.....	17
2.5	SUMMARY	17
CHAPTER 3	.....	18
RESEARCH DESIGN AND METHODS	.....	18
3.1	INTRODUCTION	18
3.2	PURPOSE AND OBJECTIVE OF THE STUDY	18
3.3	RESEARCH SETTING	18
3.4	RESEARCH DESIGN.....	18
3.4.1	Qualitative design.....	19
3.4.2	Exploratory and descriptive design	19
3.4.3	Contextual design	19
3.5	RESEARCH METHODS.....	20
3.5.1	Population and sampling	20
3.5.1.1	Population	20
3.5.1.2	Sampling method.....	20
3.5.2	Data collection	21
3.5.2.1	Data collection instrument	21
3.5.2.2	Data collection process	21
3.6	DATA ANALYSIS	22
3.7	LITERATURE CONTROL	23
3.8	TRUSTWORTHINESS	23
3.8.1	Credibility.....	23
3.8.2	Dependability and transferability	24
3.8.3	Confirmability	24
3.9	ETHICAL CONSIDERATIONS.....	24
3.9.1	Institutional approval	24
3.9.2	Informed consent	24
3.9.3	Participants' privacy, confidentiality and anonymity.....	25
3.10	SUMMARY	25
CHAPTER 4	.....	26
DISCUSSION OF STUDY RESULTS	.....	26
4.1	INTRODUCTION	26
4.2	PRESENTATION OF FINDINGS.....	26
4.2.1	Participants' demographics.....	26
4.2.2	Themes and sub-themes identified	28
4.2.2.1	Theme 1: Women have positive attitudes about working underground.....	29
4.2.2.2	Theme 2: Challenges of women working underground at a coal mine	31

4.2.2.3	Theme 3 Training opportunities and personal development	41
4.2.2.4	Theme 4: Support and lack of support underground	43
4.2.2.5	Theme 5: Needs and wishes.....	46
4.3	FIELD NOTES	47
4.4	CONCLUSION	48
4.4.1	Progress in the industry.....	48
4.4.2	Summary	48
CHAPTER 5	.....	50
RECOMMENDATIONS, STUDY LIMITATIONS AND CONCLUSION	.....	50
5.1	INTRODUCTION	50
5.2	SUMMARY OF THE STUDY	50
5.3	SUMMARY OF RESULTS.....	50
5.4	LIMITATIONS OF THE STUDY.....	51
5.5	RECOMMENDATIONS	52
5.5.1	Recommendations for occupational health nursing practice.....	52
5.5.2	Recommendations for nursing education and training.....	52
5.5.3	Recommendations for further research	53
5.5.4	Recommendations to the mine management, women employees and organised labour	53
5.6	CONCLUSIONS	54
REFERENCES	.....	56
ANNEXURE A: ETHICS CLEARANCE CERTIFICATE	.....	64
ANNEXURE B: APPROVAL OF RESEARCH TITLE.....		65
ANNEXURE C: PERMISSION LETTER TO CONDUCT RESEARCH AT [REDACTED]		66
ANNEXURE D: INTERVIEW GUIDE.....		67
ANNEXURE DD: DEMOGRAPHIC INFORMATION		68
ANNEXURE E: SUBJECT INFORMATION LETTER		70
ANNEXURE F: PARTICIPANT CONSENT LETTER		71
ANNEXURE G: CONSENT LETTER FOR AUDIO-RECORDING		72
ANNEXURE H: TRANSCRIPT: PARTICIPANT 29		73

LIST OF TABLES

TABLE		PAGE
4.1	Participants' (N=22) demographic characteristics	27
4.2	Themes and sub- themes identified	28

CHAPTER ONE

OVERVIEW OF THE STUDY

1.1 INTRODUCTION

This chapter provides an overview of this qualitative study, which explores and describes the experiences of women working underground at a coal mine. It presents background information regarding the local mining sector, the issues that stimulated the researcher's interest in this subject, and a synopsis of how the study was conducted. Measures that were taken to ensure the trustworthiness of the data collected as well as to protect the rights of the participants are described.

1.2 BACKGROUND OF THE STUDY

The employment of women in underground mining in South Africa is relatively new. The underground work environment involves hard labour and exposure to hazardous substances. Prior to the late 1990s, legislation such as the Mines and Works Act, No 27 of 1956, prohibited women from working underground (Union of SA, 1956). It has therefore been a challenge to integrate women into employment underground.

There were two important developments in 1996. Firstly, the new Constitution of South Africa (RSA, 1996), which recognised gender equality, was adopted. The Mine Health and Safety Act No 29 of 1996 lifted outstanding restrictions on women working in mines and required the mining sector to increase women's participation in mining, including allowing them to work underground (Mokotong, 2016; RSA, 1996).

Two years later, the South African Employment Equity Act No 55 of 1998 prohibited discrimination on the basis of race, religion or gender in the workplace (RSA, 1998). The mining sector was required to assess the status of women, meet their training needs and ensure that adequately skilled women would be placed in appropriate positions.

Other acts and policies that facilitated the employment of women in the mining sector were the following:

- The Minerals and Petroleum Resources Development Act (MPRDA) No 28 of 2002 (RSA, 2002) actively encouraged the entry of historically underprivileged individuals, including women, into the mining sector in South Africa.
- In 2004, the Department of Minerals and Energy adopted the Mining Charter first released in 2002, which required mining companies to actively change their demographic profile and gave them a target to achieve. According to the Mining Charter, women would need to make up at least 10% of all local mining companies' staff by 2009, to promote equity (Anglogold-Ashanti, 2004).
- Worldwide, the Millennium Development Goals, specifically goals 1 and 3, were implemented to promote gender equality and empowerment for women and to halve the world's poverty by 2015 (United Nations, 2014).
- The Human Resource Development Strategy for South Africa (HRD-SA) 2010–2030 is a strategy aimed at addressing some of the most critical challenges that the country still faces, including unemployment, poverty and income inequality, as part of 'a call to create a better life for all South Africans' (South African Government, 2009).

Wynn (2001) stated that females follow a career in mining for the same reasons as males, and that opportunities available in the Australian mining industry were the development of skills training programmes, mentoring programmes, occupational health and safety guidelines and equipment operating controls. Wynn emphasized that the opportunity to work in the mining industry should be open to all individuals regardless of gender with the ability to perform the job requirements.

According to the minerals mining bulletin statistics published by the Department of Mineral Resources (DMR) in 2014, the total average number of women employed in the mining industry was 50 182, compared to 459 917 men (DMR, 2014).

Employing women in the mining industry came with many challenges as it has predominantly been a male-dominated industry. Challenges faced by women in mining have been highlighted in literature (Forastieri, 2004; Hermanus, 2007; Singer, 2002; Zungu, 2012 and 2013). Women working underground for mining companies generally face greater health and safety risks than their male counterparts. Firstly, they have to pass the same rigorous employment tests as men; one such test requires them to climb up and down steps continuously for half an hour, in a room heated to 90 degrees, without fainting (Singer, 2002).

Secondly, they have to use machinery, tools and equipment that have been designed for men (Zungu, 2013). Thirdly, the design of the protective equipment (uniforms) used in the mining industry is based on the male physique (Forastieri, 2004). Working underground exposes one to accident and other hazards. Therefore wearing an ill-fitting protective clothing might compromise women's health and safety. Anatomically and physiologically, women are not the same as men and therefore they have different health and safety needs compared to men (Zungu, 2012). Furthermore, given that the physical demands in mining are matched with the physiology of a select group of men, women face increased risks of injury and ill-health (Hermanus, 2007).

Other areas of concern are the difficulty of maintaining a balanced family life, as well as the danger of sexual harassment in the workplace, particularly underground (Calitz, 2004). Basically, it is difficult for a few mine managers to change the entire mining industry's prevailing mind-set or view of the mining environment as a 'males-only' territory. The ability of women to work underground seems to be undermined by the mining industry's lack of understanding that women also need to work to make a living, or despite their awareness of women's needs there is nothing in place to help them cope (Mokotong, 2016).

The Kumba Iron Ore mining company presented the Women in Mining Strategy in 2012 during the Mining Lekgotla conference hosted by the Department of Mineral Resources (Kweyama, 2012). Two of the strategies presented were the provision of skills development and mentoring programmes for women in mining. It is not known whether the current mentoring, training and support offered in the coal mining industries is supportive to women working underground. Hence, there is a need to explore the experiences of women working underground in a coal mine, to ensure that the working environment in an existing or newly developed underground mine is conducive for all, including women.

1.3 PROBLEM STATEMENT

The Constitution of South Africa promoted equal rights for men and women in 1996. However, literature evidence shows that since then, the specific needs of women working in mines have not been addressed. These needs include health and safety issues, work-life balance, gender-appropriate protective clothing, preventing discrimination, being shown respect and support from management and supervisors, and being acknowledged for their contributions (Mokotong, 2016).

Studies have been conducted on women working underground at core mining for gold and platinum. However, there is no literature available on women working underground at coal mines. Issues related to these women working underground must be explored, in order to design and institute corrective programmes.

This study will attempt to answer the following question: **What are the experiences of women working underground at a selected coal mine in the Mpumalanga province?**

1.4 PURPOSE OF THE STUDY

The purpose of the study was to explore and describe the experiences of women working underground at a coal mine in the Mpumalanga province.

1.5 RESEARCH OBJECTIVE

The objective of the study was:

1. To explore and describe the experiences of the women working underground at a coal mine.

1.6 SIGNIFICANCE OF THE STUDY

The researcher anticipated that the study findings might assist the management and the occupational health team to gain an understanding of women's experiences of working underground, thus creating awareness with regards to their specific challenges and needs and the role of women in the mining industry. In addition, programmes could be implemented to maintain and further enhance the health and wellbeing of women working in underground mining. Such efforts may contribute to the retention of women employees working underground.

1.7 PARADIGMATIC PERSPECTIVE

Brink, van der Walt and van Rensburg (2013) describe a paradigm as a standard approach based on shared philosophy assumptions, concepts, values and practice. Polit & Beck (2012) explained that researchers select a paradigm that they believe is appropriate for the context of the study. This study used a constructivist paradigm that is associated with qualitative research. Qualitative research focuses on studying a phenomenon in depth, especially where the description is based on specific persons or on a group's reflection on their reality and experiences (Polit and Beck, 2012). The

focus in this study was to investigate women's experiences of working underground in a coal mine in Mpumalanga and is embedded in the following three assumptions:

The first assumption describes what the reality is (meta-theoretical or ontological). The second is related to the position of the researcher in relation to those being researched (theoretical or epistemological), and the last assumption is based on how evidence will be gathered (methodological) (Polit & Beck, 2012). These assumptions are described below.

1.7.1 Meta-theoretical assumptions

Brink, van der Walt and van Rensburg (2013) mentioned the four central concepts that influence the practice of health care service, i.e. the concepts of person, environment, health and nursing.

Person: For the purpose of this study the description of a person is twofold. The first description of a person is in the context of women who work underground in a coal mine in Mpumalanga. Women in a mining occupational setting are exposed to potential hazards. In this context the person is at the mine as an employee.

The second description of a person is in the context of the occupational health care nurse responsible for promoting and maintaining the workers' health. Currently in South Africa there is no legislation that enforces the establishment and employment of occupational health practitioners. Through observation and involvement in this industry the researcher has observed that occupational health services are generally available in large mining companies.

Environment: The term 'environment' generally refers to one's surroundings or natural setting (Webster, 2016). In the context of this study, the environment includes the working space underground, as well as the mining company's management structures, and how management is responsible for decision-making and policies that affect employees and occupational nursing practice on site.

Health is 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (World Health Organisation, 1948). In this study, mine employees must be medically fit to do any particular job at the mine. The mine management must put systems in place to ensure that employees are safe and that their health is not compromised while at the mine. Women in particular have specific needs due to their physiological make up, issues related to pregnancy and breastfeeding, and any medical conditions that need special support from

management to ensure that their health status is maintained at work. In the mine environment, employees are exposed to occupational hazards so their health is more likely to be compromised. They may be requested to work beyond their physical capability or capacity. Women's experiences underground could affect their emotional wellbeing because of their concerns about the hazards involved.

Nursing: In the 18th century Florence Nightingale defined nursing as 'the act of utilising the environment of the patient to assist him/her in his/her recovery journey' (George, 2011). The International Council of Nurses (ICN, 2002) states that 'nursing encompasses autonomous and collaborative care of individuals of all ages, families, groups and communities, sick or well and in all settings.'

In the context of the study, the commission of care of employees at the mine falls within the Occupational Health discipline. The task of an occupational health nurse is to promote the health of mine workers through education, training, diagnosis, treatment and rehabilitation.

1.7.2 Theoretical assumptions

Theoretical assumptions are statements from the researcher in relation to those being researched (Polit & Beck, 2012). The population in this study is the women working underground at a coal mine in relation to their working environment. The following operational definitions were used consistently throughout the report:

Occupational health and safety is the area concerned with the safety, health and welfare of people engaged in work or employment (Hattingh & Acutt, 2013). In this study, the focus is on exploring women's experiences regarding factors that have a potential impact on the women's *physical, mental and social wellbeing*.

Safety is the state of being safe from harm or danger (HarperCollins, 1979). In this study, safety was incorporated in view of the fact that underground mining is classified as a high-risk environment that predisposes one to accidents and other hazards wherein safety should be prioritised.

Experience is defined in the Oxford English dictionary as the practical contact with and observation of facts or events and knowledge or skills gained over time (Pilgrims & Stranger, 2014). In the context of this study, women's experiences of working

underground were explored in relation to knowledge gained or skills achieved since they started working in the coal mine.

1.7.3 Methodological assumptions

Methodological assumptions refer to the researchers' plans and decisions related to executing the research process in order to achieve the objectives of the study. Brink, van der Walt and van Rensburg (2013) further described methodological assumptions as beliefs, values and theories that guide the researcher's investigation. In the context of this study, a qualitative, exploratory and descriptive design was applied to investigate the experiences of women working underground in a coal mine.

1.8 OVERVIEW OF THE RESEARCH METHODS

In this study, a qualitative, exploratory and descriptive design was applied. The study was conducted at a coal mine in the Mpumalanga Province. The categories of workers include mining supervisors, rock drillers, blasters, cleaners, shuttle car operators, and general workers.

The population in this study consisted of women working underground at coal mine 1 (N=60). The mine where the study was conducted has three shafts, namely, mine 1, mine 2 and mine 3. A purposive convenience sampling strategy was used to recruit a minimum of 20 (n=20) participants who met the inclusion and exclusion criteria.

The inclusion criteria specified only women working underground at mine 1 who were all at least 18 years old. All participants needed to understand English although they were allowed to speak their preferred language if they wished. In this study, a semi-structured interview guide was used for data collection. The interview guide consisted of one main question, with a number of probe areas and related questions that the researcher used to augment the information gathered during each interview. The main questions asked was **'As a woman, what are the experiences of women working underground at a coal mine in Mpumalanga Province?'**

Data collection commenced after obtaining permission from the mine authorities and the women that met the inclusion criteria. A suitable quiet place away from the management offices and any possible distractions was requested and granted by the mine management.

The first step of data collection involved a pre-test data-gathering process conducted on two women from the same population, using an interview guide. The purpose of

the pre-test study was to investigate the feasibility of the proposed study and to detect any shortcomings in the research question.

The second step was the main data collection phase. The participants were encouraged to speak the language that they were most comfortable with. Most of the participants preferred to speak English, whereas some responded in IsiZulu. The one-on-one interviews were audio-taped, and field notes were written during the interviews.

The thematic content analysis method used for data analysis is described in detail in Chapter 3. The researcher used paraphrasing, reflection and probing during the discussions to facilitate dialogue and understanding. The taped interviews were transcribed verbatim. The researchers read the transcripts repeatedly to develop key ideas and a sense of the content. Similar categories were grouped under broad themes and sub-themes were identified (Grove, Burns & Gray, 2013).

1.9 ETHICAL CONSIDERATIONS

Permissions and clearance

Ethical clearance to conduct the study was requested from both the Human Research Ethics Committee (Medical) (Annexure A) and the Post-Graduate Committee of the University of Witwatersrand (Annexure B). Permission to conduct the study was requested and granted by the mine management (Annexure C). Informed consent was obtained from the participants for the interviews as well as the use of audio-tapes (Annexures F and G).

Privacy and confidentiality

The audio recordings and the hard copies of the transcripts were kept in a lockable cabinet in the researcher's office; a copy was also kept in the supervisor's office. The electronic transcripts were password-protected and thus only accessible by the researcher and the supervisor.

1.10 ORGANISATION OF THE RESEARCH REPORT

Chapter 1: Introduction and Background

Chapter 2: Literature Review

Chapter 3: Research Design and Methodology

Chapter 4: Discussion of Findings and Literature Control

Chapter 5: Conclusion, Recommendations and Limitations

1.11 SUMMARY

In this chapter an overview of the study has been given, beginning with the introduction and background. The significance of the study, problem statement, the study purpose and objectives, and an overview of the methodology have been discussed. Related operational definitions have been given.

The following chapter describes the literature review used in this study.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents a literature review of previously published studies relating to women in the mining industry. The focus is on studies with specific reference to the history of women in mining globally and in the South African context. The following databases were accessed to search for publications, articles, journals and guidelines pertaining to experiences of women working underground: CINAHL, WHO, and Mine Health and Safety Regulations were used for the purpose of obtaining relevant literature. The following search words were used: women in mining, women working underground in mining, experiences of women in mining, mine workers challenges, safety in mining, mine worker's needs. It provides a brief overview of factors that have enhanced the employment of women in the mining industry, as well as the challenges experienced by women in mining.

2.2 GLOBAL PERSPECTIVE ON WOMEN IN MINING

Literature has pointed out that mining works all over the world have been classified as high-risk work environments, because mining work involves hard physical labour, working in confined spaces, and exposure to airborne pollutants, deafening noise, injuries and thermal stress (Zungu, 2011). Botha and Cronje (2015) explained that the introduction of women into mining has created new health and safety challenges as the environment requires a high degree of physical strength.

Literature shows that globally, women have been involved in mining, whether in formal employment capacities or as part of family survival strategies.

Tallichet (2006) reported that in pre-industrial times, American women used to join their work with their partners, siblings and parents to take out coal for to be used at home. In Scotland, according to Boorman and Mayers (2006), women and girls were employed underground in the collieries as early as 1840, and they would often carry coal in baskets on their backs to climb into and out of the mines. In Sweden, during the pre-industrial period, many women worked in the Swedish iron ore mines, until 1900 when Sweden introduced a law that prevented women from working underground (Abrahamsson, Segerstedt, Nygren et al., 2014). Not all countries had barred women from working underground. Bradley (1989) has highlighted evidence

that in countries such as Britain and India, women worked underground up until the twentieth century. In India, women worked in opencast mining doing manual labour such as pushing, loading and offloading coal.

The International Labour Organisation (ILO) Convention 45 of 1935 forbade the industry to employ women in underground mining. It firmly stated that “No female, whatever her age, shall be employed on underground work in any mine” (ILO: 1935). In Japan, women had been involved in coal extraction prior to 1943 on the surface, but after 1943 they were forced to work underground because of wartime labour shortages (Allen, 2010). In Australia, women were not allowed to work underground until the mid-1980s for fear that it would bring bad luck to the mine or that the men working underground would down their tools (Pattenden, 1998). However, the legal requirements imposed by the Equal Employment Opportunities (EEO) and by Affirmative Action legislation in Australia have been major motivating factors in the change process (Pattenden, 1998). The author further highlighted in literature that it was only in the mid-1970s that companies began to hire a few women at a time, usually after being pressured by state enforcement agencies.

Literature relates that in Brazil, some mining communities were resistant to employing women due to superstitions that the presence of a woman underground would lead to fatal accidents (Anglo Ashanti-Brazil, 2007). Another study from India indicated that women employed in the mines or collieries where there were poor safety controls and monitoring measures were exposed to toxic and hazardous substances (D’Souza, Somayaji and Nairy, 2011). A study conducted by Tallicet (2006) highlights that as women began working in underground coal mines, they frequently faced unfriendliness and sexual harassment from men, and they were victims of supervisors’ selective use of promotion policies and other forms of gender discrimination. This clearly shows that even internationally, the mining sector has been predominantly male-oriented. Ranchod (2001) has evidence from interviews conducted in Zambia by Rita Mittal that culture and tradition created obstacles and boundaries to the success of women in mining industries, such as by segregation. The study further stated that only men were able to qualify as engineers, metallurgists, surveyors and blasters.

2.3 SOUTH AFRICAN PERSPECTIVE

Historically the mining industry has been a male-dominated sector internationally and in the South African context. In South Africa, women were still banned from

underground mining in the early 1990s by section 32 of the South African Minerals Act (No. 132 of 1993). Another factor that contributed to women in South Africa not being part of the mining industry were the discrimination practices that were entrenched in the apartheid system.

Post-apartheid, the introduction of the Constitution of South Africa (RSA, 1996) and the Mine Health and Safety Act (No. 29, RSA 1996) meant that women were free to join the mining sector. To further facilitate their integration, the South African government introduced the Employment Equity Act in 1998 (No. 55, RSA 1998). The main purpose was to address the inequities and unfair discrimination from the apartheid era and to allow previously disadvantaged black people, women and people with disabilities to find employment (Mokotong, 2016). Furthermore, employers in mining were expected to identify and meet training needs proactively, and to ensure that appropriately trained and skilled individuals would be placed in appropriate positions that they deserved.

Another strategy aiming to empower women worldwide was the introduction of the Millennium Development Goals in 2000, specifically Goals 1 and 3 (United Nations, 2014). The Millennium Development Goals were introduced mainly to develop gender equality and empower women, as well as to halve the world's poverty by 2015.

In 2002, the South African Mining Charter was introduced to ensure further incorporation of women into the mining sector. The initial target set out by the Mining Charter was 10% participation by women in the mining sector by the year 2009 (South African Mining Charter, 2004). A few years later, the amended Mining Charter 2010 increased the target to a minimum of 40%, as part of the change of demographics to include more women (RSA, 2010; Botha, 2016).

Despite all the efforts implemented to increase the number of women in mines, the Mineral Mining Bulletin statistics published by the Department of Mineral Resources (DMR) in 2014 showed that a total of 50 182 women were employed in the mining industry compared to 439 917 men (DMR, 2014). Only 6% changes in the demographic profile had been achieved by 2009 instead of the expected 10%, although this went up to 10.5% by 2014. These figures indicate that progress has been made, but there is slow uptake as the number is far from reaching even half of the men employed. Nene (2016) explained that the minority status of women in mining will always be a problem because the initial target of 10% was too small to truly represent women in the mining industry and to protect them from being

vulnerable. This shows that South Africa has a long way to go before achieving a significant representation of women in the mining industry.

2.4 CHALLENGES FACED BY WOMEN IN MINING

A number of studies published in South Africa highlight challenges faced by women in the mining industry and recommend ways to successfully address these challenges (such as Benya, 2009; Zungu, 2011 and 2012; Martin & Barnard 2013; Mokotong, 2016; Botha, 2016). Some of the challenges they have identified are briefly discussed in the following section.

2.4.1 Physical and health challenges

Mine work is generally classified as a high-risk occupation that is physically demanding on all underground employees (de Klerk, 2012). Therefore, there is a need for a high degree of physical strength and endurance due to the high physicality of most of the activities performed (Botha & Cronje, 2015). All employees recruited for underground mining are required to have a high level of overall fitness (de Klerk, 2012).

The first challenge is that women are expected to go through the same rigorous tests as men and yet structurally and strength-wise, they are not the same as men.

Secondly, women who do the same tasks as men are more likely to report exhaustion faster than men due to the fact that female aerobic capacity (physical work capacity) is on average 15% to 30% lower than male aerobic capacity. In addition, women are also generally less tolerant to heat (Schutte, Edwards & Milanzi, 2002; de Klerk, 2012; Botha & Cronje, 2015). High levels of heat predispose individuals to exhaustion, which has a negative impact on productivity and could increase the risks of accidents (Botha & Cronje, 2015). Furthermore, it could have a negative psychological impact on women as they might feel incompetent or ashamed about being unable to complete the tasks given to their male counterparts, especially as the mining industry is production-driven.

Botha (2016) conducted a study to investigate the challenges experienced by underground mining male co-workers. The results showed that most of the men accepted the idea of working with women, but many men felt that women did not possess the required physical strength and stamina required. Eventually, they felt, they would end up doing the women's work. The conclusion was that mining was not

for women and that women had been recruited only because of the required 10% as stipulated in the Mining Charter (Botha, 2016).

In conclusion, therefore, the challenge for women is to prove that they have been rightfully placed and are capable of performing all the delegated tasks like men.

2.4.2 Inadequate ablution facilities

Inaccessible or insufficient toilet facilities are a challenge reported in most studies on women in underground mining. Mokotong (2016) reported that women had to walk long distances to reach a toilet. Furthermore, the toilet designs are not suitable for women as there are no extra amenities such as wash basins or sanitary towel bins. To cope with this situation, they would try not to urinate, or they would eventually relieve themselves anywhere they could find, such as a nearby corner. As for the sanitary towels, they had to keep them in their pockets until they could reach the mine surface and only then dispose of their sanitary towels.

Similar results were reported by Zungu (2012) wherein women reported that they kept used sanitary towels in their handbags until the end of their shifts.

Women also reported lack of hand washing facilities at underground toilets which is an additional risk factor promoting transmission of infections. Mokotong (2016) further stated that, due to their unique female body structure and the hard labour required, their physical and mental wellbeing could be negatively affected if their physical needs are not met.

2.4.3 Isolation

Another challenge highlighted by Botha (2016) was isolation such as when one or two women work in a team of 14 men, which makes them feel uncomfortable and unsafe.

In 2012, the Mail & Guardian newspaper reported that a female underground miner was found raped and murdered at her work place, platinum mine in North West Province (Nene, 2016). This incident shows why many women working underground have expressed fear, especially when they have to work alone or be the only female in a group of men.

2.4.4 Equipment and personal protective equipment (PPE) challenge

Another challenge mentioned in Botha and Cronje (2015) was that working tools and other equipment have not been changed to suit the physiological make up of women.

Therefore, women have had to work with equipment or machines initially designed for men. Some of the underground machines are huge, and may be designed with higher climbing steps, making it difficult for women to get on and off the machines or equipment.

Interviews conducted by Patel (2012) with women working underground at the platinum mines in Marikana, North West Province, found that after over 10 years of working underground, women were still wearing gender-inappropriate gear. The author further expressed concern that female miners may choose to forfeit their reproductive rights because maternity leave often costs them lose their jobs (Patel, 2012).

Issues that meet the health and safety needs of women in mining, such as personal protective equipment and housing, warrant more attention according to De Klerk (2012).

2.4.5 Training opportunities and career advancement

Ralushai (2003) has pointed out that employers might by all means be trying to close the gap of unfair appointments processes in the work place but that changes take time; besides, training and workshops need to be conducted to equip women with the skills and knowledge necessary to offer the services required of them.

McMaster (2013) argues that the importance of female representation in the mining industry not only helps to address the skills shortage within the sector but also makes good business sense.

Buthelezi (2013) asserts that women's valuable contribution to the mining industry far outweighs the risks associated with their inclusion as employees in the operations.

This clearly shows that the mining sector has been challenged and has perceived successful integration of women into the mining industry as difficult (Mokotong, 2016).

Martin and Barnard (2013) report that women do not feel taken seriously by their employers, do not receive challenging opportunities, and subsequently do not receive better pay or positions commensurate with their talents.

Female workers believe that they are appointed to positions due to the legislation requirements and because they meet the requirements of the job (Botha, 2016).

A report by International Finance Corporation and Lonmin (2009) on women in mining mentioned that because women are fairly new in the industry, they often take the lowest positions as general workers. Furthermore, traditional beliefs that women cannot do certain jobs, and the absence of career development support programmes, make it difficult for women to be promoted, so they stay stuck in their starting job positions.

2.4.6 Lack of respect for women working underground

Calitz (2004) reported that one of the barriers into the successful integration of women in the mining industry is the cynical attitudes displayed by male miners towards female miners.

Botha and Cronje (2015) argue that although women have been employed in the mining industry worldwide for decades as clerks, cleaners, tea girls, etc, mining industries have not been the best occupation for female gender. Female workers are not a new phenomenon in the industry as such, but what seems new is the concept of women working underground in the mines.

Furthermore, Martin and Barnard (2013) point out that the difficulty of penetrating male-dominated job environments where there is unwillingness to accommodate women makes the environments unappealing for attracting significant numbers of women and retaining them.

Mxhakaza (2010) wrote that the hardest part of mine work for women was not the tasks, but rather dealing with or handling the prevailing male attitudes about women not belonging in mining.

Benya (2009) suggest that culture in the mines must be changed to accommodate women; men's attitudes must be addressed by mine management and mining material must become women-friendly. Botha (2016) argues that it is not only up to women and management to overcome challenges of integrating women into the traditional 'harsh male-dominated' work environment, but male co-workers must also be involved.

De Klerk (2012) recommended implementing programmes to address male mine workers' perceptions that women do not belong underground, and also that issues of culture and workplace environment must be given special attention.

2.4.7 Support from supervisors, colleagues and management

According to Botha (2016) women struggle to be fully accepted by male co-workers; they are still subjected to discrimination; developments opportunities are not clear and transparent, and there is a lack of effective support mechanisms for women working in mines.

Martin and Barnard (2013) report that discriminatory maternity policies still exist in the mining industry.

Botha (2016) highlighted in the study that there is a concern by men working in mining that women are not willing to perform the work they are employed for, and there is a tendency of some women using their sexuality in exchange for favours.

2.5 SUMMARY

This chapter presented literature related to the history of women in mining internationally and also in the South African context. The strategies implemented in South Africa for integration of women, as well as some of the barriers and challenges experienced by women in the mining sector, were presented. There is paucity of literature that deals with experiences of South African women working underground in coal mines. It is over 10 years since women started working underground in South Africa; however no research studies have been conducted to explore how these women are experiencing underground work.

The next chapter deals with the methodology implemented to achieve the purpose and objectives of the study in order to answer the research question.

CHAPTER 3

RESEARCH DESIGN AND METHODS

3.1 INTRODUCTION

This chapter provides a detailed description of the strategy adopted to explore and describe the experiences of the women working underground at a coal mine in Mpumalanga. The chapter also describes aspects related to the sampling methods, data collection process and the data analysis method used. Measures of ensuring trustworthiness of the research process and ethical considerations relevant to the study are described.

3.2 PURPOSE AND OBJECTIVE OF THE STUDY

As outlined in chapter one, the overall purpose of this qualitative research was to explore and describe the experiences of women working underground at a coal mine in Mpumalanga province.

The following objective was formulated to achieve the purpose of the study:

- To explore and describe the experiences of women working underground at a coal mine.

3.3 RESEARCH SETTING

A research setting is defined as a specific area, place or places where data collection will take place (Brink, van der Walt and van Rensburg, 2013). Data collection for the current study was conducted at one of the coal mines in the Mpumalanga province. The majority of the coal industries in the Mpumalanga province extract minerals using opencast (open-pit or quarry excavation) and underground (deep or shaft) mining.

At the coal mine where the study was conducted, mining takes place in three mining shafts, namely Mine 1, 2 and 3. For the purpose of this study, data collection was conducted at Mine 1, as more women worked underground in that shaft compared to the other two shafts.

3.4 RESEARCH DESIGN

Nieuwenhuis (2010) in Maree (2010) described a research design as a guide used for selecting study participants, the data collection procedures to be used, and the data analysis to be conducted. In this study, a qualitative, contextual, exploratory and

descriptive design was used in order to gain an understanding of the women's experiences of working underground at the coal mine.

3.4.1 Qualitative design

Qualitative methods are useful for studying a phenomenon in depth, especially where the description is based on a specific person's or on a group's reflection(s) on their reality and experiences (Polit and Beck, 2012). Furthermore, qualitative methods facilitate the process of achieving thick and richly detailed descriptions of the phenomenon under study through an open and flexible strategy of asking questions (De Vos, Strydom, Fouche, and Delpont, 2008).

3.4.2 Exploratory and descriptive design

An exploratory design is used to investigate a phenomenon of interest about which little is known as there are few earlier studies to refer to. The phenomenon is investigated in its full nature (Polit and Beck, 2012). In order to identify any relevant factors or variables, find the boundaries of the phenomenon, understand its causes and effects, and gain insight for later investigation (Sim and Wright, 2000).

On the other hand, a descriptive research design increases knowledge about a known phenomenon. It describes or presents a picture of a situation, together with the related functions, characteristics, events and relationships (Brink, van der Walt & van Rensburg, 2014).

Through an exploratory approach, concepts related to experiences of working underground in a coal mine were discovered and further investigated through in-depth interviews. At the descriptive level, the researcher described the women's experiences as derived from the content thematic analysis process. The experiences described by the women working underground included perceptions about their working environments, challenges, perceived support, requirements and desires.

3.4.3 Contextual design

One of the distinguishing features of qualitative research is that it does not attempt to control the context of the research, but rather tries to capture that context in its entirety (Brink, van der Walt & van Rensburg, 2014).

The current study is contextual, as the results pertain specifically to women working underground for more than a year and the study is limited to only one mine section.

3.5 RESEARCH METHODS

3.5.1 Population and sampling

3.5.1.1 Population

A population is described as the entire group of persons or objects that is of interest to the researcher, in other words, the population that meets the criteria that the researcher is interested in studying (Brink, van der Walt and van Rensburg, 2014). The population in this study consisted of all women working underground at a selected coal mine in Mpumalanga (N=120). The study was conducted at Mine 1 where the total population of women miners was estimated at 60 (N=60). Mine 1 was selected as there were more women employed there compared to mines 2 and 3, with thirty women each (N=30). The categories of workers included mining supervisors, rock drillers, blasters, cleaners, shuttle car operators and general workers.

3.5.1.2 Sampling method

Grove, Burns and Gray (2013) define sampling as an important part of research as it is the process of ensuring that eligible participants are chosen. Therefore, the sampling framework adopted should be well thought out and clearly described.

The sample include all women working underground in Mine 1 (N=60). A purposive convenient sampling strategy was used to recruit women eligible for the study who were likely to offer information related to their work experiences (Grove, Burns and Gray, 2013). Eligible participants included all women above the age of 18 working underground at Mine 1 who had been employed for more than twelve months.

Women that were on leave or not involved in underground mining activities were excluded from the study. The second group of women excluded were those employed for less than a year. No one was excluded on the basis of language, as the researcher understood the other commonly spoken languages in Mpumalanga, which are IsiZulu, Sesotho, IsiXhosa and Sepedi. A language interpreting company was employed to confirm the transcribed tapes and to expedite the processes of interpreting and translating.

3.5.2 Data collection

3.5.2.1 Data collection instrument

Data was collected using an in-depth interview guide (Annexure D), and it comprised of two aspects. The first part of the study was the demographic information.

Participants were requested to fill in the demographic data collection form and the researcher assisted where they needed.

In the second part of the study, in-depth one-on-one interviews were conducted wherein participants were requested to reflect on their experiences.

The interview guide consisted of one main question: "What are the experiences of women working underground in a coal mine?". In addition, probing words and statements were used to augment the discussion and to clarify aspects of the interview.

3.5.2.2 Data collection process

The data collection process commenced once the permission requisition process was complete and all concerned institutions had given their approval.

The mine manager was requested to provide a quiet and private area away from the management offices to conduct a small-scale interview pre-test. The venue was found to be conducive and it was also used for the main study.

Information about the study was presented at a meeting facilitated by the mining management. The nature of the study, the eligibility criteria, and the participant recruitment process were explained, and thereafter women were requested to participate in the study.

All eligible women identified from the human resources database were contacted telephonically and asked if they would like to participate in the study. After agreeing to participate, an appointment was secured, depending on their availability and on the shift they worked.

An interview pre-test was conducted on two of the women before commencing data collection for the main study. The purpose of the pre-test was to assess feasibility-related factors such as suitability of the environment; the researcher and the participants' comfort with the data collection procedure and with the duration of the interview process. These pre-test recorded interviews were transcribed, coded and

analysed; however, the results were not included in the main study, as the pre-test interviews were meant for testing and refining the data collection and analysis processes.

On the main day of data collection, a brief overview of the study purpose and the related ethical measures of ensuring confidentiality and anonymity were explained once more (Annexure E).

Every woman working underground who had agreed to participate in the study was requested to sign two consent forms. The first one confirmed agreement to participate in the study (Annexure F). The second form gave consent for audio-recording the conversation (Annexure G).

Field notes related to the observation of participants and activities of the day were recorded and used to augment data analysis.

3.6 DATA ANALYSIS

Data analysis entails categorising, ordering, manipulating and summarising the data, and describing it in meaningful terms (Brink, van der Walt & van Rensburg, 2014). De Vos et al. (2008) describe data analysis as a process of bringing order, structure and meaning to the data collected in a qualitative study. In this qualitative study, data analysis was conducted simultaneously with data collection. Data collection was conducted until data saturation was reached. Data was analysed using thematic content analysis.

Data analysis of the experiences of the women began with the verbatim transcription of each of the interviews from the audio recordings. The researcher listened to the recorded interviews repeatedly during the transcription period to develop an overview impression of the content.

Each transcript was then read repeatedly, again to get a sense of the content. The next step involved reading the transcripts and identifying the perspectives of the participants, and looking for similarities or frequently used words in the expressions of the participants.

Colour pens were used for easy identification of the important information for coding. Each colour-coded word, concept or statement was allocated a descriptive code label. This process resulted in a list of frequent terms and identified non-repetitive and non-overlapping units.

Data was coded, compared to other data and then clustered into themes. The developed list of themes was further analysed. In keeping with qualitative findings reporting systems, a list of main themes and sub-themes was then developed, and supportive statements were identified.

3.7 LITERATURE CONTROL

Literature control was done to identify where the current results fit in with existing literature. The current study results were compared with results from previous qualitative and quantitative studies conducted on women working in mining. The results and the discussion of the findings as well as the related literature are presented in Chapter 4.

3.8 TRUSTWORTHINESS

Trustworthiness in qualitative research pertains to the reliability (consistency) and validity (truthfulness) of data collected from or about the participants. In this study, trustworthiness of qualitative inquiry was ensured based on the model of Lincoln and Guba (1985) in Polit and Beck (2012). The four criteria suggested for ensuring trustworthiness of the research process and results in a qualitative enquiry are: credibility, dependability, transferability and confirmability. These criteria are described in detail below within the context of the study:

3.8.1 Credibility

Credibility refers to the degree of confidence in the truth of the data and the interpretation thereof. The aim is to show that the analysis was conducted in a way that made certain that the subject matter was correctly described and interpreted (Polit & Beck, 2012; de Vos et al. 2008).

In this study, credibility was enhanced by participants being asked to check the data sources after the data collection dialogue. Due to the nature of the work and women working shifts, it was somewhat difficult to arrange for the participants to come and listen to their transcripts. Authentic recording was ensured through the use of a tape recorder and by keeping field notes. Both the interview scripts and field notes were checked by the supervisor to further ensure credibility. Coding of the data was done concurrently by the researcher, supervisor and an independent co-coder. The two sets of codes were compared and consensus was reached.

3.8.2 Dependability and transferability

Dependability refers to the stability (reliability) of data over different times and conditions. The findings of the study must be the same if the same study is to be repeated with similar or the same participants in the same context (Polit & Beck, 2012). Lincoln and Guba (1985) in Polit and Beck (2012) describe transferability as the extent to which findings can be transferred to, or have applicability in, other settings or groups.

In this study, a purposive sampling technique was used for the selection of participants for the pilot study and for the main study. All participants were interviewed by the same researcher, using the same interview guide, having the same main question.

3.8.3 Confirmability

Confirmability refers to objectivity, that is, the potential for agreement between two or more independent people about the data's precision, significance, or implications (Polit & Beck, 2012). In this study, the researcher and the supervisor independently analysed the data to enhance confirmability. Furthermore, an independent co-coder was engaged in the data analysis and interpretation of the results.

3.9 ETHICAL CONSIDERATIONS

3.9.1 Institutional approval

Ethical clearance to conduct the study was sought from the Human Research Ethics Committee (Medical) (Annexure A) as well as from the Faculty of Health Science Post-Graduate Committee of the University of the Witwatersrand (Annexure B). Permission was also granted by the Mine Manager of the coal mine to conduct the study (Annexure C).

3.9.2 Informed consent

Verbal and written information was given to all prospective participants to explain the purpose of the study and the researcher's background (Annexure E). Informed consent was obtained from each participant for the interviews and tape recording (Annexures F and G).

3.9.3 Participants' privacy, confidentiality and anonymity

All participants were informed that their original names would not be used and that they could choose pseudonyms to protect their identities. The research report shared with the mine management would not contain the participant's original names or pseudonyms. Prospective participants had rights to ask questions, refuse to participate, refuse to offer information, and terminate their participation at any stage of the interview (Brink, van der Walt & van Rensburg, 2014).

Brink, van der Walt & van Rensburg (2014) described beneficence as one of the important ethical principles that guide researchers during the research process to ensure that the well-being of the participants is secured in respect to their right to protection from discomfort and pain. In this study, there was a possibility that those women who had had negative or painful experiences could have emotional flashbacks, so the researcher arranged for emergency referral to a hospital or social worker. All these health facilities were available within 10 kilometres of the study setting.

An information sheet was given to the participants and its content was explained. Dignity and respect was accorded to all participants and they were allowed to speak or express themselves in their own language. The interviews took place in an office away from the management office block.

Taped interviews and transcripts were randomly allocated numbers, e.g. P33, to avoid tracing voice recordings back to participants. However, a list containing the pseudo and the real names of the participants and the voice numbers was developed and used for member checking. The electronic taped interviews and transcripts were password protected. The hard copies of transcripts as well as a list containing the names of the participants were kept in a locked cabinet and were accessible to the researcher and supervisor only.

3.10 SUMMARY

This chapter has attempted to integrate the theoretical basis of the methodology with the study's significance, the research question, and the aim and objectives. The research design, data collection and analysis processes, and ethical considerations have been discussed.

CHAPTER 4

DISCUSSION OF STUDY RESULTS

4.1 INTRODUCTION

The previous chapter dealt with the methods used for data collection and the applied data analysis process. In this chapter the results are presented and an interpretation of the findings is discussed.

For the purpose of this study, a constant thematic comparative method was used to analyse data obtained from the interviews. Literature control was conducted in order to compare the findings of this study with other similar studies conducted. A descriptive quantitative approach was used to analyse the demographic information collected.

4.2 PRESENTATION OF FINDINGS

Five themes, five categories and 15 sub-categories were identified from thematic content analysis. All the transcripts were read through and translation of some scripts from vernacular to English was done where necessary. Thereafter, all the transcripts were read through again to gain better understanding and impressions of the data collected.

4.2.1 Participants' demographics

The sample consisted of 22 female underground coal mine workers and all were interviewed either in English or in the vernacular. The participants were in the age range of 18 to 50 years. The work experience of the participants underground at the same mine ranged from two to more than 10 years. The participants could express themselves comfortably in English; most of them had attended school up to at least Grade 9, with some attending up to Grade 10 or 12. A summary of the participants' details is presented in Table 4.1.

Table 4.1: Participants' (N=22) demographic characteristics

Demographic characteristics	Frequency	Percentage
Age group		
18–30	3	13.6%
31–35	10	45.5%
36–40	4	18.2%
41–45	4	18.2%
45–50	1	4.5%
Marital Status		
Never married	8	36.3%
Married	7	32%
Divorced	2	9.0%
Widowed	1	4.5%
Living with partner	4	18.2%
Ethnicity		
Black	21	95.5%
White	1	4.5%
Highest level of education		
Grade 5–8	1	4.5%
Grade 9–12	18	81.9%
Diploma	3	13.6%
Type of job		
Fitter	1	4.5%
Machine operator	4	18.0%
Miner	2	9.0%
Shift boss	1	4.5%
Other*	14	64.0%
Duration of work in this mine underground		
1–2 years	2	9.0%
2–5 years	8	36.5%
5–10 years	4	18.0%
10–15 years	8	36.5%
Have you worked underground in another mine?		
Yes	16	72.7%
No	6	27.3%

*The variable 'Other' under 'Type of job' pertains to jobs such as electrician, belt driver, belt operator, safety officer, ventilation, driver, learner miner, backbye miner and pump attendant.

4.2.2 Themes and sub-themes identified

In this section, five themes and fourteen sub-themes emerging from the results (refer to Table 4.2), as well as the related discussions, are presented. The participants' responses to the questions are quoted to substantiate the study findings.

The first theme identified pertains to the participants being proud, happy and viewing underground work in a coal mine as a valuable opportunity. The second theme deals with the challenges faced by women working underground at the coal mine. The third theme is concerned with personal development and training opportunities. The fourth theme relates to support versus lack of support for women working underground, while the fifth theme highlights the needs and wishes of women working underground at the coal mine.

Table 4.2: Themes, categories and sub-categories identified

Themes	Sub-theme
Theme 1: Women have positive attitudes about working underground.	1.1 Pride, happiness and value recognition
Theme 2: Challenges of women working underground at a coal mine	2.1 Unsuitable PPE/ Uniform for women
	2.2 Unclean toilet facilities and toilets shared with men
	2.3 Unfair treatment towards women working underground
	2.4 Safety at work/working alone
	2.5 Racial discrimination
	2.6 Lack of care for women's wellbeing & their families by supervisor/ management
Theme 3: Training opportunities and personal development	3.1 Lack of training opportunities and career advancement
Theme 4: Support and lack of support underground	4.1 Lack of support from supervisors
	4.2 Support from colleagues
	4.3 Lack of support from management
Theme 5: Needs and wishes	5.1 Opportunities in training and development
	5.2 Changes in PPE
	5.3 A need for women in leadership in mining

4.2.2.1 Theme 1: Women have positive attitudes about working underground

Sub-theme 1.1: Pride, happiness and value recognition

The first theme deals with how women felt about working underground, especially given that previously, this was an occupation reserved for males. Participants expressed a sense of pride and felt honoured to have the opportunity to work in this environment. The environment underground was described as unique, with the potential to learn and develop new skills.

One participant stated:

“Working underground as a woman myself, I am so proud because many years ago women were not allowed to work underground...I am happy to be there because I know my work.” (P26)

Two other participants shared her sentiment about contentment with working underground:

“For me, to work underground is a good thing because... most of the time, there is only men who work in the underground mine. So now I’m happy as a woman getting underground.” (P33)

“For me personally it’s an experience of a lifetime; I feel like if you haven’t worked underground I mean like you haven’t done anything yet. We’ve got our ups and downs but eh..... I wouldn’t trade it for anything; I like working underground.” (P14)

These participants expressed happiness about working underground, seeing it as something of value. Being faced with challenges from working underground would not deter such a participant from enjoying her work there.

Another participant described the benefits of working underground as follows:

“The things you get to learn, the things you get to see underground, that’s very interesting because it’s normally a male-dominated place. So when you get there, you’re a lady; there are things that you are going to learn that you never knew you could. It actually pushes you at some point from your comfort zone... so ja, it’s always a learning curve.” (P35)

Women expressed a sense of pride and showed willingness to learn and to develop themselves. Some participants viewed their jobs as opportunities to advance their

careers and to learn and do things they never knew they could do. For example, one expressed that what men can do underground, women can also do:

“I believe we can; if you believe enough in yourself, you can do it. You can do anything anywhere. Yes, underground is a male-dominated place but the ladies are doing it for themselves underground. They are. There are lady managers these days working from underground.” (P35)

The above comment is similar to a response from one of the seven inspirational women in mining interviewed by Frances (2013) with the message that “women must challenge their own comfort [zones] and realise the possibilities this environment has to offer.”

However, not all the women interviewed were happy with working underground, to the extent that they would not recommend their jobs to other women:

“It’s because me, myself I’m not happy here. I am not happy where I work.” (P29)

The same participant stated that she would not encourage other women to come and work underground:

“No, I am not going to recommend this job to others.”

Nonetheless, in sum, the majority of women in this study described their feelings as follows:

- proud to be working underground
- happy and honoured for the opportunity and privilege
- independent and successful
- motivated by potential career advancement
- confident and as capable as the men
- enjoyment of their work as the ‘experience of a lifetime’.

In contrast, Martin and Barnard (2013) found that some women working in male-dominated occupations showed lack of self-confidence and low self-efficacy. Their results further showed that women were reluctant to engage in more competitive roles with men. On the contrary, in the current study, women were determined to do even more challenging jobs.

In conclusion, however, although women expressed pride in being able to work underground, they still had to face challenges, as presented in theme two.

4.2.2.2 Theme 2: Challenges of women working underground at a coal mine

Theme two highlights challenges faced by women working underground, including unsuitable personal protective equipment (PPE); inadequate sanitation facilities; unfair treatment; safety challenges; racial discrimination, and lack of care from management regarding their wellbeing and that of their families.

Sub-theme 2.1: Unsuitable personal protective equipment (PPE)

The Mine Health and Safety Act (No 29 of 1996) stipulates that “Every manager must ensure that sufficient quantities of all necessary PPE is available so that every employee who is required to use that equipment is able to do so.”

Furthermore, the Guideline for Women in Mining (WIM) PPE (referenced DMR 16/3/2/5-A2, No. 39228 gazetted on 25 September 2015) gives guidance to the mining industry on the selection and provision of PPE for WIM. All mines in South Africa, both underground and on the surface, are required to compile a code of practice for the implementation of this guideline, which became effective on 31 December 2015. This implies that all mines should have provided their female employees with the correct PPE after his date.

However, the four responses below show that women in this study had not yet been provided with the correct PPE.

One participant mentioned:

“...The problem that’s coming to me, it’s coming over to my PPE. That is the problem. Especially, there’s only one overall. It’s the thing that gives me the problem especially when I go to the toilet. I am supposed to take all of my overall, and sit in the toilet. Removing all the lights, the rescue packs.” (P33)

A second participant expressed that the personal protective clothing feels heavy and that she is not used to wearing flat shoes. The walkways underground are a potential hazard because of mud and water:

“...firstly the PPE that you need to wear, the belts, the lamp, the rescue pack is heavy; then you have to wear the gumboots; as women we are so used to heels – then you have to wear the flat shoes for the whole day. Then you go underground, there is water, there is mud, it is difficult to go there. The PPE is heavy.” (P25), the overalls are a problem, probably because they are cumbersome with many attachments. Another issue mentioned was that when workers are sick and they have

to work underground, they feel worse, probably due to poor ventilation and humid conditions:

“Maybe if you are in your periods and you are wearing an overall, it becomes difficult when you want to go to the toilet; these overalls are just problematic. And also if you have flu and you go underground it becomes worse.” (P37)

A fourth participant echoed the issue of the materials used to make the personal protective clothing being of poor quality, ill-fitting, and prone to shrinkage:

“I think the material is not good, because [at first] you get the right size, [but] maybe someday it is getting too small. When you wear it more than five to ten days, then they wash it there at the laundry. When you wear it [again], it [feels tight on] you”. (P36).

Several studies, both locally and internationally, have consistently reported that men and women are not the same in terms of their anatomical and physiological makeup (Zungu, 2012; Mokotong, 2016; Barnard & Martin, 2013). Hermanus (2007) explained that inappropriate PPE exposes women to greater safety risks.

During the interviews In this study, women reported that they were wearing ill-fitting PPEs designed for men. A study by Zungu (2013) also found that the PPE provided by mining companies was not suitable for WIM as it was uncomfortable to wear because it had been designed for the male physique. During the interviews in this study, some women reported that the mine had promised to issue them with proper PPE, but that the process was very slow and they continued to use the ill-fitting male PPE.

Sub-theme 2.2: Unclean toilet facilities and toilets shared with men

Among other common challenge faced by the women was the lack of hygienic toilet facilities underground. One participant had this to say with regards to the toilet facilities:

“There are challenges throughout the day. Like the toilets we are using. Yoh... they are dirty, okay they do clean them; they do change the buckets every week, but then you find out that the men are using the ladies’ toilets and then you will find it dirty when you want to use it, so I think they should be locked.” (P30)

Another participant echoed:

“And the toilets, please, [it’s] a disaster down there...it’s a disaster. I mean like we are ladies...sharing a toilet with men.” (P31)

A third participant explained that she-bins (pad-disposal containers) had not been provided:

“But they are not that comfortable for ladies cause if you... you are like menstruating, we [are] having problems when it’s that time of the month; we don’t have places to throw out our pads and things like that, so that is like the main part; we are not comfortable in that way.” (P14)

The second challenge stated by the women in the current study is inadequate toilet facilities for women and sharing the toilets with male colleagues. Toilets are available but are not marked and men tend to use those intended for females. A similar situation was reported in Martin and Barnard (2013) where one of the participants had to “ask one of the guys to [keep a lookout] while she was in the toilet as there were no specific toilet facilities for women”.

Inadequate amenities such as change rooms and toilets is a challenge highlighted in many of the research studies on women working in underground mines, to varying degrees (Martin and Barnard, 2013; Zungu, 2012; & Botha, 2016). In Calitz (2004), on women in the platinum mining industry, only two participants (out of n=14) mentioned the unavailability of toilets and it ranked last out of 12 identified themes.

In the current study, women stated that in many instances they needed to walk long distances to access toilets. The impact of the current situation is that women might postpone the need to relieve themselves, possibly leading to urinary tract infections. Dehydration could be another complication as they might avoid drinking fluids so that they don’t have to go to the toilets (Zungu, 2012).

A third concern was the hygiene status of the toilets and lack of proper disposal bins for sanitary towels. Benya (2009) stated that underground toilets that are shared with men present a challenge for women having their menstrual periods. In a study by Zungu (2012) on challenges faced by women in selected gold and platinum mines, 95.7% of the women reported a lack of bins for used sanitary towels, and 96.4% of the women kept the soiled sanitary towels in their bags until they could find a convenient place to dispose of them.

Similarly, Mokotong (2016) reported that due to lack of proper bins, women carried their soiled pads in plastic packets in their pockets and dispose them when they reached home.

The situation could be similar in the current study as there are no bins provided specifically for women to dispose of sanitary towels.

Benya (2009) stated that sharing underground ablution facilities with men is a serious concern to women in mining. Martin and Barnard (2013) raised the concern that none of the women in their study were aware of existing policies aimed at promoting a conducive working environment. A conducive environment in this context implies meeting all the needs including basic sanitary requirements.

In summary, Calitz's sentiments (2004) were that if the mining industry is unable to meet such elementary needs as women's basic sanitary requirements, it is unlikely to be able to accommodate greater needs of women miners in the workforce.

Sub-theme 2.3: Unfair treatment towards women working underground

This sub-theme highlights women's experiences in terms of how they are treated by their male colleagues and supervisors. Participant expected that men would accept them and treat them equally; however, that was not the case. The participants expressed their thoughts that men felt threatened by their presence underground, believing that women are there to encroach on their space. Culturally, some men still feel that a woman's place is 'in the kitchen', as per the following quote from one participant:

"...There are people who do not believe in women in mining. They actually don't believe that we're capable of working underground, especially as supervisors. They think that we're not strong enough to lead the male people." (P35)

The reluctance of men to accommodate women working underground makes the environment unfavourable for women, as expressed by this participant:

"...to work underground, it is tough, because sometimes other people, [like] if you talk to the supervisor [to request] that they may help you maybe to do this and this, or maybe you will come [to them] with the plan, they don't take this plan of yours; they do not want it because they said a woman can't work underground." (P28)

A second participant stated that some men believe that women do not want to work: *"He said [that] we 'want to sleep, so women in the mine, I don't prefer it that they can come and work here'." (P29)*

Martin and Barnard (2013) highlighted that for women, the difficulty of penetrating historically male-dominated occupations, coupled with the unwillingness of men to accommodate them in those occupations, makes the environment unappealing for attracting and retaining more women into these fields. When a woman does not know her way around the job then the male colleague tends to be disrespectful, as cited by Benya (2009). The following quote illustrates this point:

“These people, like our supervisor, they do not treat us well; maybe sometimes they talk to you as if you know nothing. Maybe you will tell them I want to do this, they do not want that; they want what, they want on their side. They do not think for another people; they just think for themselves, and maybe you are coming with the ideas; they do not want the ideas from a woman. They say you are woman, you can’t control a man because you are a woman.” (P28)

Another participant echoed that:

“If someone tell[s] them, ‘Guys, don’t do this thing,’ you know, if you are a woman and then you are here, [and] you find the old Madala (old man) working, [and] you say, ‘Madala? No, this one, you’re performing [this] unsafe.’ [He says] ‘No, dit is lank aan hierso.’” (P33) (Translation: No we have been [doing it this way] for a long time.)

Men in the mining field believe that women do not occupy any space in that sphere of occupation, making the women in mining trying all means to convince their co-workers that they are capable of doing the mining job (Calitz, 2004).

As mentioned by one participant, men appear to not be willing to assist women working underground with on-the-job training even when they show willingness to learn:

“...Even if you are asking a question you can see that he is not – he is not interested. Even the foreman, because I think the foreman is there to ask you if you are you getting the right training, are... The foreman won’t even greet you. He will just go past you as if he is not seeing anyone.” (P25)

Participants feel they are not treated the same at work. Men are still enjoying better privileges like those that were offered to them historically, and until such time as the mining industry changes its stereotypical attitude towards women, this will continue. Section 9 of the South African Constitution (1996) prohibits discrimination based on gender. More needs to be done to address inequality issues in the mining industry. Martin and Barnard (2013) agreed that women’s opinions are undermined by their male co-workers and the entire mining industry.

Women working underground feel that they are not treated the same as their male counterparts. They feel they are not welcome to work underground, that not everything they do is taken seriously by their supervisors, and that men are treated better than women with regards to work position. As one participant emphasised:

“The way we are treated, even our shift bosses don’t treat us equally.” (P34)

A study conducted by Martin and Barnard (2013) also highlighted that women working underground feel that their organisations do not take them seriously, that they do not receive challenging opportunities and subsequently do not receive the pay or positions commensurate with their talents.

Two participants supported each other; the first stated that:

“We feel like, at times we feel like we are taken for granted because we are women.” (P14)

The other participant echoed:

“It’s like, it’s not nice you come to work and you do not know what is going to happen. You always have that fear. Even if you did something small because you are a woman it’s going be big; just the fact that you are a woman you see...you will end up being suspended, but then if that thing was done maybe by a guy, it was...they won’t take it serious...; [but] it’s a huge deal...it will [end] up to be something big because you are a woman.” (P23)

Women’s personal fulfilment is essentially connected to professional success, and like men, women need mentors for guidance and development, opportunities to excel and to be recognised for their effort relationships, and flexibility to achieve work/life balance from their companies (Feyerherm and Vick, 2005).

In this study, the participants expected their supervisors and management to treat them equally irrespective of gender. One participant said:

“ifavouritism iboss uthola ukuthi I boss yenu izo favour one person in the whole group ukuthi loyo muntu won’t work hard as rest the others do. Uzwa kuthiwa uhleni phezulu anazi ukuthi wenzani you have never seen that person underground mhlawumbe nimbona him twice or three times a week and iyanicindezela loyonto nigcina seningasazwani kahle nina lento yokhuthi ingathi umphathi uthanda ubani kangcono uma kunezinto anikhoni ukubambisa.” (P17). (Translation: “The favouritism, the boss – you find out that your boss will favour one person in the whole group and that person won’t work as hard as the others do. You get to hear that he is now in a higher

position but you don't know how that person got there. You have never seen that person underground. Maybe you see him twice or three times a week and it bothers us and we end up not being on good terms with each other, because the manager likes the other person better, so we don't work as a team or together.”)

In summary, this sub-theme indicated that some male colleagues and supervisors have shown disrespect towards women in mining. Furthermore, they have undermined women's capabilities and the roles of those appointed in supervisory positions. Women's suggestions and advice have not been considered. This is despite the Constitution of South Africa (1996) stipulating equal treatment for all, with dignity and respect.

Sub-theme 2.4: Safety at work/working alone

An underground mining environment is totally different in many ways from that on the surface. Work allocation underground depends on the job description and is not gender-based; therefore, women tend to find themselves working alone. The underground working environment often has dark, cold and humid conditions. Working alone in a dark place can be frightening for anybody, and is particularly bad for any women who feel vulnerable.

Women participants in this study felt unsafe while working alone for fear that something could happen to them and they might not be saved by anyone else, as mentioned by the following study participant:

"Those toilets –where they are, it is dark, and maybe you are working with a team of fourteen guys and you are the only lady.” (P25)

The second participant supported the above:

“Sometimes you don't feel nice for you; and the other thing, you are working underground; you work at a risky place, which is not safe to work alone. Somebody if they can come to you and maybe do something and you can't be heard by another person because you are working alone.” (P28)

A third participant clarified that:

“Working underground is difficult and scary if you are a woman and a driver. You are alone and there is no one to come and see you. Now it's two o'clock until eleven; you are the only one and it's too far from other people.” (P37)

Safety in this study was also raised in the context of the communication system underground. Participants stated that there is poor communication.

“Safety is not 100%. As I’ve said, those who are working at belt drives who are alone there – if anything happens to you, like you have a heart attack, who’s going find you there? How can you go to a phone [to] call control because this thing is like a sudden thing?” (P31)

“Most of the time I work alone. I’m working at the section belt. I go underground with the section; they leave me there, they go inside... if you [see] something like the joint is not well, you must call them, [but] we don’t have a radio. Sometimes the phone is not working – the radio. I’ve been reporting this thing for almost two years to the safety officer that I need the radio because my section is too far now, I’m alone there. Sometimes I have a breakdown, the phone is not working. I have to stay, the control will see the belt is on stop, [and] then he will tell the miner, ‘Go to the section 23 and check the belt is on stop.’ If I collapse there, I will die. I’m alone.” (P29)

These participants raised an important aspect of safety and security underground: they do not feel safe to work alone at their work place.

The study by Calitz (2004) also supports the above statement that women tend to work alone in small areas where there is poor supervision at times and they are then exposed to physical or other forms of abuse. Botha and Cronje (2015) also found that some female participants did not feel safe when working night shifts, and at times there were only one or two women working together with several men during night shifts.

Another important issue raised by the participants is the poor communication system underground, which could be disastrous in an emergency. Additionally, with ablution facilities being far from work areas, women have to walk longer distances alone in the dark.

The change of legislation in South Africa (1991) stipulated the employment of women in the underground mining environment, which implied that there should be huge pressure on the mining sector to protect female workers (Calitz, 2004). However, there is currently no legislation or guideline in South Africa that regulates such security or enforces systems for the safety and security of women in mining.

Sub-theme 2.5: Racial discrimination

Literature has indicated that women in mining are still subjected to serious discrimination by their male colleagues (Botha, 2016). Despite all the legislation instituted, race and gender discrimination continues to exist across various industries in South Africa, as noted by Calitz (2004). On entering the mining industry, women were discriminated against based on their gender. Based on Calitz's observations (2004), black women were offered menial jobs, whereas their counterpart white colleagues were offered higher status positions. .

The women studied herein indicated that racial discrimination takes place at work, as evidenced by the following statements:

Abafazi do not get developed and abelungu they get developed and you won't find a white person lower level...no.....uthole umlungu eskobeni but la e number two okay enumber one besinayo leyo issue leyo kodwa lana they have white people working there but naleyonto yokuthi white people get developed faster than blacks and they do not go through training.” (P17) (Translation: “Women do not get developed and whites they get developed and you won't find a white person at the lower level....no... whites [work] at the cage (regarded as lower status job but here at number two, okay at number one we had that issue but here there are whites working at the cage; even then, white people get developed faster than blacks and they do not go through training.”)

Another participant said:

“...I am [working] like 8 years in [the] mining industry; yes the [past] 5 years I was here; this is my 5th year now already. I came [here] as a miner. I was supposed to be already on the level of being a shift boss or a captain, but I tried... but actually it's – let me say it straight – it's because of a colour in this company; the colour, the colour; the black colour [isn't] recognised, only the whites; they are the first priority.” (P16)

The participants in this study had anticipated that as they continued to gain experience underground, they would be promoted to higher positions irrespective of their race. But the results suggest that discrimination against women based on race is still being practised. Mxhakaza (2010) echoes the observation that gender discrimination still exists, regardless of the good policies in place to promote transformation and integration of women in the mining industry.

Spicker (2017) reports that for the feminist theorist, liberal feminism “emphasises the rights of women as individuals. It argues against discrimination and stereotyping and for equality of respect and opportunity.” Liberal feminist theorists want the removal of

systems with limitations and unfair connotations for women's progress, whether in their careers or their general wellbeing. Mokotong (2016) adds that feminists recognise that gender inequalities are widespread in the world, and that women still feel oppressed in many areas of life. Liberal feminist theories help researchers to understand issues of power and diversity in our society. Botha (2016) pointed out that the mining industry could have a more successful integration process if male employees get involved in issues pertaining to women in mining, and if management ensures that a company's vision includes gender diversity.

Sub-theme 2.6: Lack of care for women's wellbeing and their families by supervisors/ management

Women have multiple roles to play at home (as dual reproductive and economic unpaid workers), socially, and at work (as paid workers). Many women have active roles to play in the upbringing and wellbeing of their children, so naturally women feel they must be given the opportunity to fulfil those roles where possible (Calitz, 2004). Botha (2013) stated that women spend many hours at work and miss out on vital family responsibilities, especially childcare issues, which predispose women to stress. Forastieri (2004) has stated that due to women's multiple roles in society, female workers have special needs concerning nutrition, lifestyle and reproductive health. Ultimately, women have unique needs, including family responsibilities, especially those who are single parents.

Calitz (2004) believes that the mining industry must put systems in place to prevent women being exposed to any dangerous situations, and in addition, the industry must accommodate the greater needs of women in the workforce, especially their need to balance work and family life. Martin and Barnard (2013) stated that women's work-life balance needs have the potential to affect their performance in a male-dominated environment. Female workers may be harassed by their male co-workers for taking time from work to attend to family issues such as child care or personal illness. Apparently these male co-workers assume that the women are taking advantage of their family issues to absent themselves from work.

Some participants from the current study felt that management was not sensitive to their immediate needs, as indicated by the following statements:

"Like for instance, [when] you are sick, you go to the doctor; a sick note is going be a problem when we going to take the sick note to [the manager]. It's like you can't be

sick; I mean, I'm a human being – why can't I get sick? It is winter, everybody like [has] flu...they want you [to] like be 24/7 here at work.” (P31)

Another participant emphasised that she feels forced to come to work when sick even if she presents a medical certificate to support her absenteeism:

“Yes, we come to work, even [if] you have a complaint.... if you [are] not coming [to] work for my sick child or if it's like me not [feeling] healthy sometimes or [if] I am not feeling good I am going to the doctor... No...why are you absent? Come at work ...uya understand?” (P20) (Translation: “They say, ‘No, why are you absent? Come to work.’ Do you understand?”)

Therefore, according to some participants, some mining managers or supervisors are not sensitive to their specific needs, and they are forced to work even if they are sick or not feeling well.

The International Finance Corporation and Lonmin (2009), regarding integrating women into the mining workforce, suggested the need for lifestyle support for female mine workers who are taking care of their children and households. It is important for mining companies to provide such support, such as day care facilities and employee assistance programmes to their women employees.

MacMaster (2013) also recommended that the mining industry needs more flexible working conditions to better accommodate women miners.

Ozkon and Beckton (2012) suggested that work–life balance in the mining industry could be enhanced by adopting some best practices, including creating a flexible work roster and introducing employer-funded parental leave programmes. Further, they recommended that mining companies have policies and guidelines that provide for family-related events for both male and female workers.

4.2.2.3 Theme 3 Training opportunities and personal development

Sub-theme 3.1: Lack of training opportunities and career advancement

According to a study by Benya (2009), women have expressed a greater desire than men to further their studies, to enable them to leave the physically demanding underground occupations and become learner miners or artisans.

The study participants felt that they deserve equal opportunities to study further and advance their careers as they do not believe in stagnant career paths. They

highlighted the fact that while opportunities are available from their employer, these seem to be a fruitless exercise as they are not given time for study leave because there is a concern about shortage of staff. This suggests that management is more concerned with production than with giving them opportunities for training or further studies.

Relevant quotes from the participants include:

“...Once you work in the scoop there is no time to go and learn other things. I won't mention me because I'm not educated, but to do other training and learning other things, when you ask to go they will tell you that there will be no one left in your workplace if you go.” (P37)

Another participant corroborated:

“Even if you want to upgrade yourself you can't, honestly you can't. Like in one centre they are doing gas testing [and] flame proofing, but if you like apply to go there they'll tell you, 'If you go there, who's going to stand in your place?' Those kinds of things...” (P31)

Women strongly believe that they should be offered the opportunity to advance their careers if they wish to do so. Participants indicated a lack of challenging opportunities at work, and their readiness to take advantage of these when offered. They felt that no one should be telling them what to do when it comes to personal development.

They believed that some in the mining industry still see them as 'unfit' to work underground because, as women, they are 'meant to' look after children and take care of households. Some participants highlighted that the mine had offered them opportunities for study, but their supervisors did not approve time off for study leave because they were more focused on the impact on production, and complained of shortage of staff, overlooking the employee's personal interests.

Martin and Barnard (2013) also identified poor training or career advancement opportunities in the mining industries, especially underground. This goes directly against the Employment Equity Act No. 55 of 1998 (RSA, 1998), which requires mining industries (both surface and underground) to extend training opportunities to women in mining.

Ozkon and Beckton (2012) support the view that in order to promote a more women-friendly culture in the workplace, employers must establish a formal system of

mentoring female workers, and they should consider transferability of skills from other divisions to entice women into leadership positions swiftly.

4.2.2.4 Theme 4: Support and lack of support underground

Sub-theme 4.1 Good and poor support from supervisors

Since underground mining is a new occupation for women, they need strong support and mentoring from their male counterparts. The results in this study showed that despite the negative attitude of certain men underground, some men and male supervisors have provided support and have shown much respect for women in mining, as reported by the following participants:

“...My supervisor is a fine guy. You can speak to him [about] anything, even if it’s a problem from home. He is an open person. He listens. He understands when you are explaining something.” (P25)

A second participant confirmed:

“We understand each other, yes. If I have problem I talk to him and he will listen to me [and to] what I say and then he will respond right. I have got no problems with him... I am getting enough support because they put trust in me.” (P26)

A third one commented:

“For work I am okay 100 percent. Even my supervisor is a yazi ...he is a person okhona uku understand umuntu wesifazane and akhone ukutreat umuntu wesifazane fair. Akabi nokuthi ahe wena ungumuntu wesifazane kumele siku treate ngalendlela amadoda.no he treats us equal.” (P24) (Translation: “For my work I am okay, 100%. My supervisor is a person who understands a woman and treats us with fairness. He does not say, ‘No you are a woman, you should be treated differently from a man...’. No, my supervisor treats us fairly and he is very understanding.”)

Mokotong (2016) explains that women have demonstrated competency as well as willingness to learn from their male colleagues and this has made it easier for the men to accept and respect them.

The expressions quoted above show that some women perceived their supervisors as being supportive and empathetic and willing to listen to their problems. However, not all women shared the same experience:

“So, ama supervisors wethu they don’t have our best interest at heart.” (P17). (Translation: “So, our supervisors don’t have our best interests at heart.”)

Divergent opinions were obtained with regards to support from supervisors as indicated by the responses above. These employees further explained that supervisors do not care about their unique health and safety needs as women working underground. Therefore, divergent opinions were obtained with regards to support from supervisors.

This illustrates the lack of support for women in mining, with women often feeling neglected and unheard, with their complaints not being taken seriously (Botha, 2016).

Sub-theme 4.2: Good support from colleagues

There seemed to be a common feeling from a majority of the participants that they had a good relationship with their male colleagues and that they were helpful in orienting them to the on-site job. For example:

“...usually when you start at the section, they will introduce you to the guys, then the Safety Representative and the miner will show you around the section. They will tell you what is dangerous, what needs to be done, what [does] not need to be done and whatever you are not sure of, who to speak with.” (P25)

A second participant mentioned:

“For me, colleagues.... They are good to me here. Well we’ve been good with my colleagues because when I’m at work, I don’t like being referred to as a lady; they always treat me like a guy. I’m one of the guys; that’s what I love about them. If there is something, we all do it together. They don’t say “because I’m a girl” cause vele (yes) yeah I actually don’t like that, so what I love about them, it’s like when I’m with them I feel like I’m one of the guys.” (P14)

In this study the results suggested a good relationship between female and male co-workers. This implies positive acceptance of women by fellow male colleagues.

A study conducted by Martin and Barnard (2013) found that some women were adopting certain coping mechanisms, such as taking on male characteristics or modifying their feminine appearance. This is done in order to gain support from males, as they felt that a lot of men were still resistant to accepting and supporting female co-workers. Nonetheless, they appreciated that on the whole, mining had been changing.

Sub-theme 4.3 Lack of support from management

Some participants felt that they do not receive any support from the management as their sole employer. These participants also believe that the management must play a bigger role in ensuring that women are supported in their work life:

“...so actually we don't get enough support as women from management; yes especially the women; they don't take them seriously whether you [have] got the potential to do the job, they don't.” (P16)

Another participant explained:

“...You know what this mine is doing... is good in satisfying other people – not their [own] people – especially external people, and not us internal people – us working here full time; they don't care about us...[they] don't care, especially [about] women; they don't develop them, they don't... they would rather take external women and bring them [in]....” (P19)

So there are varying opinions with regards to support from supervisors, male co-workers and management in this study.

Some participants indicated good relationships with their colleagues and their supervisors, implying satisfaction with management. Others expressed that they hardly meet the mine management and therefore their line of communication stops with their supervisors. They expect the supervisors and management to be more understanding when it comes to their requests. However, such requests may not be considered based on the fact that most of the managers are males and might not fully understand women's unique problems.

Research has shown that, on the contrary, some women have developed a sense of tolerance, and may also have various coping mechanisms in response to the challenges of working underground, hence they do not consider a career or job change.

Benya (2009) confirms that women are given tasks unrelated to the core focus of the company, and they are treated as inferior partners, being given 'easy' tasks to do. However, the author mentions that women try to persevere in doing hard labour underground to gain the respect of men.

Botha and Cronje (2015) argue that mining companies should abide by the requirements of the Basic Conditions of Employment Act (BCEA, RSA 1997) in terms

of the treatment of women during and after pregnancy. The authors further mentioned that compared to their male counterparts, women have unique needs in terms of the PPE provided. Ill-fitting PPEs can affect the way women are protected as well as their ability to perform their jobs.

Botha(2016) stated that women in the mining industry have indicated that they are not listened to and that their complaints are not taken seriously by management; Botha made suggestions that sensitivity training be provided to managers of mining companies to help them understand the needs and perspectives of different employees.

4.2.2.5 Theme 5: Needs and wishes

In this study the participants were asked what their needs or wishes were. The three most cited requests were: opportunities for training, proper personal protective equipment, and for management to address their specific needs as females.

Sub-theme 5.1: Training opportunities and personal development

Most of the participants stated the need for urgent attention to be given to opportunities to study further so that they can advance in their careers. One participant stated:

“We would like to be developed. Like me for instance, I started as a cage operator. I went to be an electrical aid; I am an electrician now, but I wish that someday I can be an engineer.” (P14)

Generally, all participants are of the view that women should be offered training opportunities to further their studies. They also hope that with the experience they have gained, they will be considered for higher positions.

Sub-theme 5.2: Changes in the PPE

Participants voiced their need for management to supply them with suitable and comfortable PPE/uniforms, as per the guidelines in place.

“...They can change our overalls. I think that will be better. That we can use two pieces and not that one piece because you have to take everything off if you want to use the bathroom.” (P32)

In South Africa, with government intervention, the Guideline for a Mandatory Code of Practice on the Provision of Personal Protective Equipment for Women in Mining was gazetted in 2015. It offers guidance on the type of PPE to be issued to women in all

mining industries in South Africa (DMR 16/3/2/5-A2, 2015). It will be interesting to see how the coal mining industry complies with this guideline going forward.

As of this writing, the poor-fitting PPE clothing currently available makes it difficult for women to be productive at work and to use the bathroom efficiently. Women have indicated that an urgent intervention is needed and that management must issue them with comfortable PPE based on their anatomical and physiological make up. The MHSA, Act No 29 of 1996 states that employers have the responsibility to promote the health and safety of their employees. Ill-fitting PPEs can cause various types of skin irritation and infection.

Sub-theme 5.3: Need for women in leadership in mining

Participants mentioned the issue of women leadership in the mining industry, stating that they look up to women role models holding higher positions in the male-dominated environment. They feel encouraged that these women are leading men.

One said:

“...We are here now, so we wish we can have a woman engineer [or] something but because we don't get enough time to study that is the problem for us. That is the main problem actually.” (P14)

Another one said:

“...we see there [are] only foremen...only men that are foremen; there is no lady foremen around here... [there] are only men [in a] high position; you can get only men no ladies...no ladies, not at all...not at all.” (P15)

The need for mentors is a vital and constructive copying strategy for women, as highlighted by Martin and Barnard (2013). MacMaster (2013) cited the lack of mentorship and support for women in mining as one of the challenges faced by female miners and recommended that women should seek out skilled mentors or coaches themselves, in order to develop their confidence and assertiveness.

4.3 FIELD NOTES

- **Observational notes**

At the beginning of the interview, some participants were not free to talk but as the interview proceeded they opened up. Contrary to this, most of the participants sounded so ready to tell how they feel about working underground. It felt as if they have been waiting for this opportunity to talk and voice out their anger as evidenced by their facial expressions. There were mixed emotions expressed by the participants

because some sounded happy to be working underground beside the working conditions that are of concern to them.

- **Methodological notes**

Weaknesses exposed by initial interviews were noted and improvements were made as the interviews continued. As the interviews were being recorded, non-verbal communication (such as facial expressions) was noted for analysis.

- **Personal notes**

I felt privileged to have met with these women who have managed to work in a male-dominated environment against all odds and who are adamant that with support from the industry, they will be more successful.

4.4 CONCLUSION

4.4.1 Progress in the industry

A report by the Mine Health and Safety Council (2012) stated that the mining sector must strongly consider promoting women's health and safety as well their special needs. Furthermore, the DMR is worried about the health and safety of female workers in the mining industry, especially the inhumane treatment of female miners by fellow mining workers in some underground workplaces (DMR Keynote address, 2014).

Mokotong (2013) felt that although progress has been noted in the employment of women in underground settings, there is still a long way to go before diversity and change can be fully achieved in the mining sector.

The Mine Health and Safety Council noted the progress made by the mining industries in as far as reaching the Mining Charter's requirement for employing women underground; however, they caution that the mining environment was never properly prepared to incorporate or accommodate women for underground work.

4.4.2 Summary

This chapter presented the demographic information of the participants as well as the outcomes of the in-depth interviews conducted. The results and discussion focused on a central theme: 'Women working underground at a coal mine expressed how they

feel about working there.’ The discussion also concentrated on the categories identified from the outcomes, namely, being proud to work underground in (and despite of) a male-dominated environment, challenges encountered, lack of career development, poor management support, and what is required to fulfil the women’s unique needs.

The next chapter presents conclusions drawn from the study and makes recommendations to meet the needs of women in mining as well as recommendations for further research.

CHAPTER 5

RECOMMENDATIONS, STUDY LIMITATIONS AND CONCLUSION

5.1 INTRODUCTION

This chapter concludes the research study by presenting a summary of the study and the significance of the main findings. The chapter also presents the limitations of the research and puts forward recommendations for occupational health practice, education and future research.

5.2 SUMMARY OF THE STUDY

The purpose of the study was to explore and describe the experiences of female miners working in an underground coal mine in the Mpumalanga province.

To achieve the purpose of the study, a qualitative, explorative, descriptive and contextual research design was used to answer the central question: "I would like you to tell me about your experiences of working underground in a coal mine as a woman." In-depth one-on-one interviews were conducted and data saturation was reached after 22 interviews.

5.3 SUMMARY OF RESULTS

The majority of the participants were single black women, between 28 and 50 years old. They mostly worked as machine operators and belt drivers (Annexure H). The imbalances that have existed in mining for decades in South Africa have been partially addressed with most mining houses meeting the minimum requirements set out by the Mining Charter. The study findings have identified and captured diverse experiences amongst the participants.

Theme 1: Women have positive attitudes about working underground

Some participants felt excited and honoured to work in a male-dominated environment whereas others were disappointed about working underground. It is known from the literature that working underground at a mine comes with unique challenges for women, but the interviews indicated their hopes that transformation in the mining industry will eventually happen. Women in mining wish to be recognised

as employees who are there to enhance production and contribute to the mining industry, not just to earn money.

Theme 2: Challenges of women working underground at a coal mine

Working conditions in a surface coal mine differ from those underground. In South Africa, employment of women underground started 15 years ago, but unfortunately the study results show little progress in terms of integrating women in underground settings. The safety and security, appropriate protective clothing, and provision of ablution facilities are all issues enforceable by the Mine Health and Safety Act, 1996, which requires all mines to comply. This study shows that not complying with that section of the MHS Act could be attributed to a poor integration system being implemented. If not attended to, the safety and security, PPE and provision of ablution facilities could expose women employees to health and safety hazards.

Theme 3: Training opportunities and personal development

Many women felt they had not been given enough opportunities to advance their careers. They expressed the wish that training and staff development opportunities could be made available to all employees regardless of gender.

Theme 4: Support and lack of support underground

There were some participants with mixed feelings, both hoping for a change in future and understanding that they themselves needed to show more interest in their work. The results highlighted the need for mentoring and support programmes, but they also showed that discrimination is still a challenge in the mining industry.

Theme 5: Needs and wishes

The study participants suggested various improvements for underground working conditions. Some might argue that such changes are drastic and could take many years; nevertheless, participants expressed hope that the mining industry would change for the better “one day”. Participants reported that they wished for suitable PPE, safety and security underground and safe ablution facilities to be provided.

5.4 LIMITATIONS OF THE STUDY

Limitations identified in the study were as follows:

- Data collection was done at one mine only (namely Mine 1), therefore the study findings could not be generalised across the mining industry; however, some of the issues and recommendations concerning support needed and best practices with regards to women could potentially be extended to many women in mining.

- The participants were purposively selected from only one mine amongst 3 mines at the coal mine. Therefore, the study findings could not be generalised to all three mines. Nevertheless, the findings from the study provided some insight into the general experiences of many women working underground in coal mines.
- Some participants opted to speak IsiZulu to express themselves freely, so the researcher used both English and IsiZulu to communicate with these participants.

5.5 RECOMMENDATIONS

Recommendations for nursing practice, education and further research are suggested based on the study findings.

5.5.1 Recommendations for occupational health nursing practice

- Occupational health nurses should be trained regarding the health and safety needs of women working underground in the coal mining industry.
- The occupational health nurses must be trained to identify signs of emotional or stress-related illnesses and to manage these appropriately.
- Having an understanding of the challenges faced by women working underground at coal mines, occupational health nurses should be able to advise and support the mine management in compiling policies that relate to these women.

5.5.2 Recommendations for nursing education and training

The following areas need further attention in nursing education and training.

- Training institutions should include counselling programmes in the curriculum to empower occupational nurses to deal with emotional needs arising from stressful work environments.
- Occupational health nurses should be able to implement a risk- and gender-based medical surveillance programme to help deal with specific health needs of women employees.
- Management and employees should be trained regarding gender diversity in the workplace.

- Existing WIM committee structures should be given training and empowerment to assist them in dealing with women's issues and to be able to advise the management on such issues.

5.5.3 Recommendations for further research

The following areas need further research regarding women working in the underground coal mining industry.

- A majority of women in the study voiced concerns about working alone in dark areas underground; therefore options for ensuring the safety and security of women should be addressed.
- Women are still treated unfairly in the male-dominated mining environment. Gender discrimination remains an issue, so future research is recommended to address such discrimination.
- The implementation of skills-development programmes should be explored.
- Future research is recommended on the integration of women into the coal mining industry with appropriate support programmes in place.
- The specific training needs of women working underground should be researched.
- The results indicate a need for further research on the provision of better ablution facilities.
- Women's personal protective equipment should be selected and provided in compliance with existing guidelines, and the current levels of compliance to the guidelines need to be determined.
- The role of the WIM forum in the mining industry should be clarified.

5.5.4 Recommendations to the mine management, women employees and organised labour

- Gender diversity and mining occupational culture training sessions could assist employees and management to understand and respect each other.
- Recruitment promotion policies and procedures should be fairly implemented on merit.
- The existing Women in Mining forum should be supported at all times by management, employees and organised labour.

- Management should reconsider the provision of separate ablution facilities for women, taking risk assessment into consideration.
- The management needs to fast-track the provision of personal protective equipment made specifically for women in mining. This emphasises the compliance to the MHSA Act, 1996.
- Safety and security of women working underground is a big concern, hence management needs to put systems in place to ensure that women are not exposed to dangerous situations where sexual abuse or even murder could occur.
- Women have special needs i.e. different needs to men; therefore it is important that all employees and management try to be sensitive and support female employees' needs wherever possible.
- Women are part of the workforce that contributes to the successful production of the company; hence they need support from mentors, i.e. people who will guide and show them how to do certain things. Women who are excited about working underground generally wish to advance their careers, so policies that deal with job promotion and personal development should be implemented and the guidelines should be made available to all employees.

5.6 CONCLUSIONS

It is clear from the literature that the local mining industry was not adequately prepared for women to start working underground in the 1990s. It seems that the issues related to women in mining surprised many in mining management as well as male mine employees. There is some progress in terms of what has been done to meet the Mining Charter requirements, but some mining industries appear to simply want to meet the target of 10% without understanding that employing women underground involves fundamental changes to work processes, equipment, workplace culture, and administration.

This research found that at a specific coal mine in the Mpumalanga province, the women working underground experienced many of the same challenges as those working at local gold or platinum mines, except perhaps for the issue of sexual abuse, as no such experiences were expressed in the interviews. The issues of safety and security, ill-fitting PPE, and poor skills development programmes were the main concerns for the women in this study.

Understanding their experiences of working underground provides potentially valuable information to the mine management regarding systems to be put in place to assist with the integration of these women.

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ANNEXURE A: ETHICS CLEARANCE CERTIFICATE



R14/49 Ms Lindiwe Betty Matshingane

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M150437

NAME: Ms Lindiwe Betty Matshingane
(Principal Investigator)

DEPARTMENT: Nursing Education
[REDACTED] Coal Mine, Mpumalanga


PROJECT TITLE: Experiences of Women Working underground at the Coal Mine in Mpumalanga Province

DATE CONSIDERED: 24/04/2015

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: AM Tshabalala

APPROVED BY: 

Professor P Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 17/07/2015

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report.**

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

ANNEXURE B: APPROVAL OF RESEARCH TITLE

UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG



Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

03 June 2016
Person No: 981249
PAG

Miss LB Matshingane
PO Box 1789
Evander
2280
South Africa

Dear Miss Matshingane

Master of Science in Nursing: Approval of Title

We have pleasure in advising that your proposal entitled *Experiences of women working underground at a Coal Mine in Mpumalanga Province* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

A handwritten signature in black ink, appearing to read 'S. Benn', with a horizontal line underneath.

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

**ANNEXURE C: PERMISSION LETTER TO CONDUCT RESEARCH
AT [REDACTED]**

THE HEALTH INSPECTOR
DEPARTMENT OF MINERAL RESOURCES
PRIVATE BAG X7279
WITBANK
1035

Ref: MG01 / 08/03/2016

08 March 2016

Mrs Betty Matshingane

**RE: REQUEST TO CONDUCT A RESEARCH PROJECT FOR FULFILMENT
OF ACADEMIC PURPOSES AT WITS UNIVERSITY**

With reference to your request to conduct a research project at [REDACTED] Coal, regarding "women in mining" in order to fulfil requirements for your academic qualification, [REDACTED] Coal hereby confirm that your request has received management approval.

For further logistical arrangements and necessary assistance in this regard, please contact us on [REDACTED]

Kind Regards

[REDACTED]

**MR [REDACTED]
[REDACTED] MANAGER (ACTING)**

ANNEXURE D: INTERVIEW GUIDE

**TITLE: EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A
COAL MINE IN MPUMALANGA PROVINCE**

INTERVIEW GUIDE

Main Questions:

Please tell me about working underground as a woman.
What is it like for you to work underground?

Probes:

1. Women-specific occupational health and safety.
2. Supervisor/ co-worker relationship and support.
3. Opinions regarding woman skills training, mentoring and support.
4. Opinions regarding other needs.
5. Management commitment towards meeting women's needs.

ANNEXURE DD: DEMOGRAPHIC INFORMATION

DEMOGRAPHIC INFORMATION		
Participants will be requested to choose/decide on a pseudonym:-----		
<u>Instructions:</u> Please tick a relevant answer:		
Age	25–30	1
	31–35	2
	36–40	3
	41–45	4
	45–50	5
Marital Status	Never married	1
	Married	2
	Divorced	3
	Widowed	4
	Living with partner	5
Ethnicity	Black	1
	White	2
	Coloured	3
	Indian	4
	Other	5
Highest level of education	Grade 5–8	1
	Grade 9–12	2
	Diploma	3
	Degree	4
	Masters	5
Please state your qualification/s Technical etc		

Type of Job	Fitter	1
	Machine Operator	2
	Miner	3
	Cleaner	4
	Roof Bolter	5
	Shift Boss	6
	Mechanics	7
	Other	8
For how long have you been working underground in this mine?	Less than 2 years	1
	2–5 years	2
	5–10 years	3
	10–15 years	4
Have you worked underground in another mine	Yes	1
	No	2

ANNEXURE E: SUBJECT INFORMATION LETTER

TITLE: EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A COAL MINE IN MPUMALANGA REGION

Subject information letter:

Dear Madam

My name is Lindiwe Betty Matshingane and I am an Occupational Medicine Inspector of Mines in the Mpumalanga province. I am currently studying for a Master's Degree in Nursing Education at the Faculty of Health Sciences of the University of the Witwatersrand. I am required to complete a study under the guidance of a research supervisor as part of fulfilling the requirements for the Master's degree.

May I invite you to consider participating in a study to explore and describe the experiences of women working underground at a coal mine? Participation is entirely voluntary and there are no risks involved. Refusal to participate or withdrawal from the study at any time is assured. Your responses will be kept confidential. Should you agree to take part in the study you will be asked to please sign the attached form.

A qualitative study involving in-depth semi-structured interviews using an interview guide will be used. This will take approximately 45 minutes. Data collected will remain strictly confidential. Anonymity is guaranteed as neither names nor identifying data will be recorded. Should you feel uncomfortable you may decline to answer any question presented to you.

Findings of the study will be made available to the senior management of the facility.

Please feel free to contact me at these numbers: [REDACTED] or [REDACTED] should you need more information or you can contact my supervisor Ms M Tshabalala at [REDACTED].

Thank you for taking time to read this letter.

Yours sincerely,

Lindiwe Betty Matshingane

ANNEXURE F: PARTICIPANT CONSENT LETTER

TITLE: EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A COAL MINE IN MPUMALANGA PROVINCE

PARTICIPANT CONSENT LETTER

INVESTIGATOR: Lindiwe Betty Matshingane

I hereby invite you to consider participating in a study **to explore and describe the experiences of women working underground at a coal mine in the Mpumalanga region**. Participation is entirely voluntary and there are no risks involved. Refusal to participate or withdrawal from the study at any time is assured. Your responses will be kept confidential. Should you agree to take part in the study you will be asked to please sign the attached form.

A qualitative study involving in-depth semi-structured interviews using interview guides will be used. The researcher will conduct the interview and clarify matters of concern. This will take approximately 45 minutes. Data collected will remain strictly confidential. Anonymity is guaranteed as neither names nor identifying data will be recorded. Should you feel uncomfortable you may decline to answer any question presented to you.

Findings of the study will be made available to the senior management of the facility.

Please feel free to contact me at these numbers: [REDACTED] or [REDACTED] should you need more information or my supervisor Ms. M Tshabalala at [REDACTED].

The above points were discussed with the participants and in my opinion; the participant understands the risks, benefits and obligations involved in participating in this study.

.....

.....

Investigator

Date

I understand that my participation is voluntary and that I may refuse to participate, or withdraw my consent and stop taking part at any time without penalty. I hereby freely consent to take part in this study project.

.....

.....

Signature of participant

Date

ANNEXURE G: CONSENT LETTER FOR AUDIO-RECORDING

TITLE: EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A COAL MINE IN MPUMALANGA PROVINCE

CONSENT LETTER FOR AUDIO-RECORDING

INVESTIGATOR: Lindiwe Betty Matshingane

Your permission is requested to use an audio tape recorder for the purpose of capturing data during interviews.

The study to explore and describe the experiences of women working underground in a coal mine in Mpumalanga region will be conducted as a qualitative study. The study will involve in-depth semi-structured interviews. Interviews will be conducted by the researcher with the aid of an audio-tape recorder. Recordings and transcripts will be stored securely and accessible only to the researcher and the supervisor. Please feel free to contact me at these numbers: [REDACTED] or [REDACTED] or my supervisor Ms. M Tshabalala at [REDACTED] should you need more information.

The above points were discussed with the participants and in my opinion: the participant understands the risks, benefits and obligations involved in participating in this study.

.....
Investigator

.....
Date

I understand that my participation is voluntary and that I may refuse to participate, or withdraw my consent and stop taking part at any time without penalty.

I hereby freely consent to being tape-recorded in this study project.

.....
Signature of subject

.....
Date

ANNEXURE H: TRANSCRIPT: PARTICIPANT 29

DATE COMPLETED : 30/06/2016
NUMBER OF PAGES : 11
PROOFREAD :

LB: Good Morning, Mawiniza.

M: Good morning.

LB: How are you this morning?

M: I'm fine and you?

LB: I'm fine, Sisi, thank you. Ma Mawiniza, as I have actually explained to you the purpose of my research study what it's all about and thank you so much for participating or agreeing to participate in this interview. I'd just like to know about what is it, or please tell me about working underground as a woman?

M: Working underground as a woman is very difficult because [in] most cases places underground are built for men not for women. At the place where I'm working, I'm a belt driver; I don't have a waiting place; I just sit there all the time, outside. I don't have a place to stay. Even a chair, I don't have a chair.

LB: When you say a place to stay you mean for to rest or...?

M: Yes, to rest. Everyone got their waiting place; the section got the waiting place; the backbye maintenance station has but the back driveway where women work, we don't have a waiting place. They just drop you there.

LB: Does your job as a belt driver allow you at some stage to sit and rest?

M: Yes.

LB: Oh okay.

M: When your belt starts running, you check the joint and you check the water spray then most of the time you are sitting down.

LB: Okay; oh, you don't have to be, I mean you standing all the time?

M: Yes.

LB: You've got time to sit down?

M: Yes, I've got a lot of time to sit down.

LB: So how do you deal with that problem now? Have you reported?

M: I've been working here for five years. I don't think they will solve this problem. I don't think they are prepared to do because it is, we'll tell them we want a waiting place, they tell us we want to sleep.

LB: Oh, they say you want to sleep there? Have you actually explained to them the importance of you, I mean, sitting down at some stage while you are doing your work? Why is it important that you need to take rest or...?

M: Yes, we always reported to the safety department that we want something [like] a small shelter because where we work, a belt driver is on a road [and] the ventilation is too much there, so it's too cold. Every day is too cold. We sit outside, [with] nowhere to go.

LB: Do they give you thermal clothing? Anything that you can keep yourself warm when you say it's cold?

M: They did give us jackets a long time ago, long time.

LB: So what are you using now when you say long time ago? Are they still in good condition?

M: We borrow something on the change house to wear or we bring own clothes at home.

LB: The last time they issue was long time ago but now as of now they don't give you anything?

M: It's been three years since they give us the jacket. Now it is winter maybe they will give us something but we not sure.

LB: Have you actually reported [this] to your supervisor?

M: Yes, we tell them that it's winter; we need jackets. They said they will organise it but they don't.

LB: They don't?

M: Yes.

LB: What is it like for you to work underground? Please explain, do you enjoy or do you like working underground?

M: As for me on my side, I don't like working underground. I was studying data capture at Boston Business College but I didn't have a chance to get my job so I apply here; I got the job working underground but I'm not happy there, I'm not happy.

LB: Why you not happy?

M: The situation where I'm working, I'm not happy.

LB: What is [it] about where you are working that makes you not happy specifically?

M: Most of the time I work alone. I'm working at the section belt. I go underground with the section; they leave me there, and they go inside. I'm always sitting alone, [with] no one to talk to, just the belt and me. You need someone to talk

to; sometimes you need to talk to someone; you can't work eight hours alone, and you need to talk to someone.

LB: Mm.

M: I don't have someone to talk [to].

LB: Any other reasons why you need someone, other than talking to [them]? Is there any other reason?

M: Yes, if you [see] something like the joint is not well, you must call them, [but] we don't have a radio. Sometimes the phone is not working, [that is] the radio. I've been reporting this thing for almost two years to the safety officer that I need the radio because my section is too far now, [and] I'm alone there. Sometimes I have a breakdown, [and] the phone is not working. I have to stay [and hope that] the control will see the belt is on stop; then he will tell the miner [to] go to the section 23 and check [why] the belt is on stop. If I collapse there, I will die. I'm alone.

LB: Have you talked to your supervisor about this issue?

M: I'm reporting this to the safety, to the elders. I'm always reporting, always reporting this but no one's coming back to me. My shift boss, I told them, I told the team, we want the radios on our side. They said they don't have a budget and on the belt drive, only women [are] working there, no men. Men are working with crew, belt extension maybe 15 guys, and maintenance 15 guys. They working day shift, only day shift. On afternoon shift we are alone, [and] night shift alone.

LB: How is the situation there when you work alone; is it dark?

M: Too dark; it's too dark; maybe we have two lights or three lights on your drive. All the places are dark.

LB: And you are there as a woman alone?

M: Alone, night shift, afternoon shift, alone. If you want to report [that] we want something [like] a shelter to stay there, our Mine Captain [says] we want to sleep.

LB: If you want a shelter?

M: Yes. He said we want to sleep so I do not prefer women to come and work at the mine..

LB: You don't prefer?

M: Mm.

LB: Why? Why [are] you saying that?

M: It's because me myself I'm not happy here. I'm not happy where I work.

LB: So you won't recommend [that] anyone, any woman to come and work in a mine?

M: No, I'm not going to recommend [it]. Maybe you can be a miner working in a section because there a lot of people working there but there are less people working at backbye area.

LB: What is a backbye?

M: Backbye where the belt drive [is], the belt extension, they call it the back by.

LB: Is it a place that is far from where most people are working?

M: Most people are working at the belts.

LB: Yes.

M: We call it the backbye

LB: Yes. Are there any other problems that you encounter as a woman working underground, [besides] that they let you work alone, you feel it's not safe and there's no communication system and you don't have anyone to talk to or to report to, and that you might collapse and nobody will ever find you?

M: Yes, we [are supposed to get] the miners when [we] work afternoon shift, but they don't come to us, they have to come and sign the checklist, but they don't come.

LB: Mm.

M: They only come on the day shift because they know the shift bosses are there. On the afternoon shift they don't come. The night shift they don't come and another thing, the toilets are not in a good condition.

LB: Mm.

M: Because everyone is using it.

LB: Good condition in which way now?

M: They always dirty. They are dirty.

LB: And when you say everybody is using them?

M: The guys from the belts, the maintenance, the belt extension, they [are all] using them. When you go to use the toilet, it's very dirty.

LB: Mm. Don't they have toilets allocated for them at their own workplace?

M: They have because they have a waiting place. They come to our belt and check [it], the maintenance guys [check] the belt extension, they always, they working days shift, they come to our belt and do the maintenance, [and] when they are done they [are] using the toilet.

LB: Mm.

M: And the contractors, there are many people who are working there. The pump attendants come and use the toilets. They don't care if this toilet is for women; they use it.

LB: Is it marked for women?

M: They are marked.

LB: So when you say everybody's using them you mean even men are using that toilet?

M: Yes.

LB: What do you think should be done?

M: Maybe we must have a key, because now the safety officer is organising the key for women [so] that we must use the one code.

LB: Okay, [so] if you want to enter the toilet you'll use that code?

M: That code yes.

LB: So any other person who doesn't have that code won't enter the toilet?

M: Yes, that's it; maybe that thing is going to help us.

LB: Mm. How would you describe your relationship with your supervisor?

M: My relationship with my supervisor is good, so far it's good.

LB: Is it good?

M: Yes.

LB: Why you saying [that] it's 'good'?

M: Because if I report something, she listens, but she doesn't act.

LB: She just listens [but] doesn't act?

M: We told [her] that we don't have the PPE, we don't have that dust mask. "Ja, I'm going to organise it"; then you stand, [she] is going out, you never see...

LB: Does [she] bring it back or...

M: You never see.

LB: When you say it's done. He will bring it back?

M: No, he's not going. We have to ask for your section they give you gloves.

LB: Do the section people give you if you need?

M: Yes, if you we ask them but they complaining, "you not part of the department", I'm the backbye, [so] I'm supposed to have the PPE from my shift boss.

LB: Mm.

M: Shift boss [at the] backbye are working day shift.

LB: Yes.

M: On afternoon shift we don't see them.

LB: Mm.

M: But the miners they don't come to us. If you don't have PPE then you going [to] work the whole week without gloves and dust masks.

LB: Mm. So there's no way that you can report somewhere or get the PPE?

M: Sometimes we don't see the safety officer on afternoon because they always in the office. We just come and change in the room and go to underground. We don't see them. If you want to report something you report it on day shift, you see them because we have [a] meeting on their shift every morning.

LB: Mm.

M: Yes, we report it and most of the time the overall we wearing is not comfortable for us. If you want to go to toilet you must undress all this you see, mos.

LB: Mm. You say the PPE? The overall is not comfortable for women?

M: Yes, because it's all size for men, one size.

LB: One size?

M: Yes, not comfortable for us, yes.

LB: Mm.

M: They always promise us to give us another overall with a zip here but nothing happened until now.

LB: Mm.

M: Yes.

LB: And your relationship with your colleagues then?

M: Yes, we [are] working nice with my colleague[s]. The maintenance guys if they find you got breakdowns they [are] helping you.

LB: When you say the guys you mean the women now, women colleagues?

M: Everybody.

LB: Oh, everybody.

M: Yes, everybody is very nice, yes they're very nice.

LB: Mm.

M: Yes, if you have [a] breakdown, most of the time breakdowns [on the] day shift they attend [to] well. Miners and shift boss they always attend, but on afternoon and night shifts, there's no people.

LB: Mm.

M: There's no people.

LB: Do you believe you receive enough assistance and support to work underground?

M: To support from where, from who?

- LB: From everybody, from management, you know like when you work underground are you assisted and supported enough, are you given all the things that you need for you to go and work underground and even the knowledge and skills that you need, are you getting enough support?
- M: Not enough, they give you support from the training centre and medical, yes, they give me more support but our management does not give us support.
- LB: What's the problem there?
- M: We've got this overall then we must go to work. When complaining about the PPE, ja, [to] our shift boss, if you just do the job, [we have] got [a] lot of problems there.
- LB: Got lot of problems there? When you are complaining about personal protective equipment, they don't listen?
- M: They listen to me...
- LB: They listen but they don't act; that's what you said before.
- M: They don't act; mm, they don't act.
- LB: Mm. What is your specific need as a woman working underground; what do you need?
- M: As a woman you need the place. Everyone got their waiting place there, only women we don't have, only women we don't have a waiting place. We go with the section, they leave you there with the road then you go to your belt, that's the place where you have to stay. You have to stay or have to stand all day, [for the] whole shift we don't know because we have to organise something to sit [for] yourself [like] a wheelbarrow or something, you sit there with the wheelbarrow. Most of [the] time we are using the wheelbarrows to sit.
- LB: Mm.
- M: Yes.
- LB: That's all about the specific needs that you feel you need to have when you [are] working underground.
- M: Yes, because it's too cold there and we are scared. Maybe if we work with the guys or something. Maybe two, maybe you can work two, two per belt, maybe, you have someone to talk to.
- LB: Mm. You said you are cold and you are scared?
- M: Yes, because where we work is too far, it's too far. If your phone is not working you don't have something to report with.

LB: Mm. So now you are saying if they can actually provide you with this, the rest place, something to wear, thermal wear for the cold and also you [want] to feel [you] have someone to work with so that you shouldn't be scared?F

M: Yes.

LB: Then you'll feel that you would be comfortable to work underground?

M: Yes, maybe we, I'll be comfortable because now we are scared that someone will come this side or this side; we don't know and we don't know where to run.

LB: Mm, but how do you cope all alone with that problem because you said you've been working here for a long time. How do you deal with that problem?

M: I'm dealing with this problem, every single day of my life.

LB: How?

M: I'm just accepting that I'm working; I have to work to support my family.

LB: Mm.

M: I've learnt to accept it because there is no way they [are] solving this.

LB: Mm.

M: I can see everyone is working so I've stopped complaining and [I] work and do the job that they hired me to do.

LB: What do you feel about the commitment of the management with regards to meeting your needs, what you need?

M: I don't see they care about this thing in underground because when they are around, they see we work alone but they don't act. One day our manager arrived and asked me, "Are you afraid to work here?" I told him that I'm scared here, every day I'm scared.

LB: What was his answer?

M: He said we'll organise someone to work, come and check, he said he will organise someone to come and check [on] us every day and give us radio[s] and we must call control every hour that we are safe. I told him if I call control every hour that I'm safe, one day maybe same time I want to tell control that I am safe, one of the guy[s] attack[s] me, then who will tell control that I was attacked because the section will see me after maybe five hour[s'] time, they will see this woman who's been attacked. No one will see me because the belt is running; if the belt is standing, is on stop, that's the time you will see that the belt is on stop [and] you'll send someone there to check, only that.

LB: Mm.

M: But that thing we didn't do because we didn't like the thing we must tell the control we are safe, that we didn't do it.

LB: What do you think will resolve, what will keep you safe or make you feel safe? What needs to be done to resolve this problem now because they didn't issue you with radio, what do you think needs to be done by the management?

M: Maybe if we can work with groups like men. If you can work with groups like men maybe we can be safe because maybe two or three.

LB: You feel at least working with men, you'll be safe?

M: Yes.

LB: Or rather working in groups, even if it's not men; [is] that what you mean?

M: Yes, because last year December, there was [an] issue of people stealing cable there. On my belt they found some cable was cut there. I was really scared at that time because there were people at the back, they were cutting cable; I don't know where the people were, from the mine or outside the mine; I don't know.

LB: Oh, so you don't know whether they were strangers or miners.

M: Yes, because they find the cable were cutting there and, yes

LB: After that incident that occurred at your workplace, what was the reaction of your management?

M: Nothing happened; [we] continue [to] work like this.

LB: Mm.

M: The safety officer came with the security, they go there at the back that's where I see them. Other than that we didn't hear anything.

LB: Mm.

M: They found those cable there lying down, they didn't do anything.

LB: Mm.

M: And the women here, they don't develop us.

LB: They don't?

M: They don't develop women here.

LB: In which way?

M: Like they can send us to the training centre more, learn more things. If I'm a belt driver, I'm a belt driver for six years, working one job [with] no improvement, no nothing.

LB: Mm. You mean there's no career progression?

M: No. You must improve yourself not the mine. If you applying they say it is not part of your line, like me I want to be a software specialist, they always tell me that it's not my line, I'm a belt driver in the mining but I don't like mining like, part of the mining industry, you know.

LB: You don't like mining?

M: I want to be out of the underground but now I'm working d.

LB: Mm. Basically you're not enjoying working underground?

M: I hate it. I'm not enjoying it.

LB: Is there anything else that you would like to tell me about or you think it's important for me to know about working underground?

M: All that we have talked...

LB: You said all the things?

M: Yes, I've said all the things that I don't like underground.

LB: Mm.

M: That's it.

LB: Mm, okay. Thank you very much for your time and information. Is there anything that you will like to ask me about?

M: What do you do, your career?

LB: I'm a nurse.

M: Okay, a nurse?

LB: By profession, yes.

M: Okay.

LB: Then I specialised in occupational health.

M: Okay.

LB: And now I'm doing this education.

M: Okay, are you enjoying it, your job?

LB: Yes, I'm enjoying it.

M: Okay, thank you.

LB: Thank you, okay.

Qualitative Data Analysis

Masters in Nursing Education

Lindiwe Betty Matshingane

THIS IS TO CERTIFY THAT

Dr. Annie Temane has co-coded the following qualitative data:

22 Individual Qualitative Interviews

For the study:

**EXPERIENCES OF WOMEN WORKING UNDERGROUND AT A COAL MINE IN
MPUMALANGA PROVINCE**

I declare that the candidate and I have reached consensus on the major themes, categories and codes reflected by the data during a consensus discussion. I further declare that adequate data saturation was achieved as evidenced by repeating themes.

Annie Temane



M.A.Temane (D.Cur; Research Methodology)

annie.temane@gmail.com