A STUDY OF FACTORS CONTRIBUTING TO NON-COMPLIANCE WITH RESPIRATORY CONTROL MEASURES AMONG MILLERS IN LUSAKA URBAN

BY

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DECLARATION

I hereby declare that this study for a degree of Bachelor of Science in Nursing has not been presented either wholly or in part for any other degree.

It is entirely the result of my own individual effort.

Signed:.....
CANDIDATE

Approved by:.....
SUPERVISING LECTURER

STATEMENT

I hereby certify that this study is entirely the result of my own individual effort. The various sources to which I am indebted have been acknowledged in the text and references.

Signed:.....
CANDIDATE

DEDICATION

This study is dedicated to my late twin sister Nelly and my children Chisenga and Mofya.

ACKNOWLEDGEMENTS

I wish to express my gratitude to my sponsors, The University of Zambia through the Staff Development Office who made it possible for me to undertake this Bachelor of Science Degree in Nursing.

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ABSTRACT

The main aim of the study was to determine factors contributing to non-compliance with the respiratory control measures among Lusaka Millers. The study was done with a view of assessing the main problems that contributed to non-compliance with the respiratory control measures.

The study was done at three of the six registered milling companies in Lusaka that were randomly selected.

Data was collected by use of a questionaire for three managers, interviews were conducted on a random sample of fifty (50) male employees working in the factory plant. A factory observation guide was used to collect complimentary information. The collected data were analyzed manually and findings presented in tables.

The findings revealed that lack of adequate funds adversely affected the procurement of adequate protective equipment (especially masks) for employees, lack of trained safety personnel to deal with worker education in occupation health and also deal with other occupational sefety services.

The employees were not provided with adequate protective equipment and lacked adequate knowledge on occupational health and safety because there were no trained safety personnel to conduct training for them. There is need, therefore for

companies to acquire and ensure that suitable protective equipment is provided for the employees and initiate their education on safety and health.

CHAPTER 1

1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

The lung is the most common site of occupational diseases. Urban dwellers inhale and retain as much as 2mg of dust daily and workers in dusty occupations may inhale ten to hundred (10-100) times that amount (Sheppard, D. et al 1990).

A U.K. study of 1975, on "Airborne contaminants in industry" revealed that industrial processes produce airborne contaminants and that their most common route of absorption is by inhalation whose potential risk is increased by the expanding world industry and increased speed of production (Hall; S. (1975). This inhalation of organic and other vegetable dusts causes respiratory allergy, asthma, bronchitis and other infections not only in employees but their families too (W.H.O.) Chronicle Report, 1975).

Epidemiological studies in Germany have shown that frequency of respiratory diseases is higher in air polluted areas which can exhibit both acute and chronic effects. This effect is particularly evident in smokers. The acute effects occur when atmospheric concentration of the pollutant are extremely high, where as chronic effects are the consequence of a long standing exposition to low doses (Beyen, K. & Schilipkoter, H.W. 1986).

It has also been observed that a large number of industrial and agricultural employees are exposed to dusts from various hazards such as flax, tobacco and grain etc. And that statistics in producing countries have shown a 60% prevalence of respiratory diseases such as byssinosis in cotton and flax employees, pulmonary imitation in tobacco and grain processing industries (W.H.O. Chronicle Report 1975).

Some studies in the U.S. have revealed that after repeated exposure to flour dust, bakers often developed respiratory problems a disease now called 'Baker's Asthma" (German, F.D. 1990). Therefore, all dusts are more or less injurious to health at least when breathed in excessive amounts (Danbenspeck, W.G. 1974).

This public concern of the potentially adverse effects of the contaminants at the work place, the home and community environment resulted in the development of a number of Government activities the world over to protect the health of workers and the community at large (La Dou, J. 1990). This then inspired the U.S. legislation to lead the world in environmental monitoring and control of the working environment which later led to the passage of the occupational safety and Health Administration Act of 1970 (O.S.H.A.) in the United States of America. This had replaced the labor standards. (Cotes; E.J. & Steel; J. 1990). The objectives as laid by OSHA have broadened from dealing with the occupational diseases to include all kinds of factors at work to the working conditions that may contribute to disease or

deviate from health.

In Zambia the Factory Act of 1965 under CAP 514 of the Laws of Zambia Section 87 of the health Factory Act on "Inhalation of dust or fumes" states that "where in connection with any grinding, cleaning, spraying or manipulation of any materials there is a given off dust or fumes of such character and to a such extent as to be likely to be injurious to the health of persons employed, suitable respirators or otherwise shall be provided to prevent inhalation of such dust or fumes" Section 102 further states that "it shall be the duty of every person employed to comply with the requirements of such of these regulations as relate to the performance of or the refraining from an act by him to co-operate in carrying out these regulations and, if he discovers any defect in the machinery plant or equipment, to report such defect without unreasonable delay to his employer or foreman".

The Factory Act obliges employers to maintain the safety and hygienic standards which are laid down. Employees and all other interested parties should participate in establishing the standards. According to the Act each industry has to follow the laid down regulations as follows:-

(i) Maintain the general cleanliness of the factory;

(ii) Provide adequate ventilation and avoid over-crowding in the workrooms;

(iii) Provide protective equipment;

(iv) Provision of worker education and training.
(see appendix for details)

In America the adoption of the administrative measure as a respiratory control measure was found helpful as it offered some protection when rotation of workers was introduced in the industry so that each worker had less average exposure time than one worker performing a hazard job continuously (Levy, S.B. & Wegman, H.D. 1988). In U.K. it was also found that suppression of dust at the source may be prevented from becoming airborne by water being applied at the site of energy transfer. Also maximum effect is achieved when total enclosure is maintained at a pressure slightly below atmospheric air in order to prevent leakage of dust (Cotes, J.E. 1989).

A review of the health statistics at one of the milling companies showed that the most prevalent problems attended to at the company clinic were respiratory conditions such as bronchitis, asthmatic cases, pulmonary tuberculosis and ordinary cough. Below is a table showing statistics on attendances for respiratory problems at National Milling from January to December 1993.

TABLE 1: MONTHLY ATTENDANCES FOR RESPIRATORY PROBLEMS JAN - DEC 1993

MONTH	TOTAL NUMBER OF MONTHLY ATTENDANCIES	% OF MONTHLY ATTENDANCIES
January	48	9.08
February	09	1.70
March	22	4.16
April	30	5.67
May	49	9.26
June	36	6.80
July	46	8.70
August	66	12.48
September	60	11.34
October	57	10.78
November	48	9.07
December	58	10.96
Total	529	100%

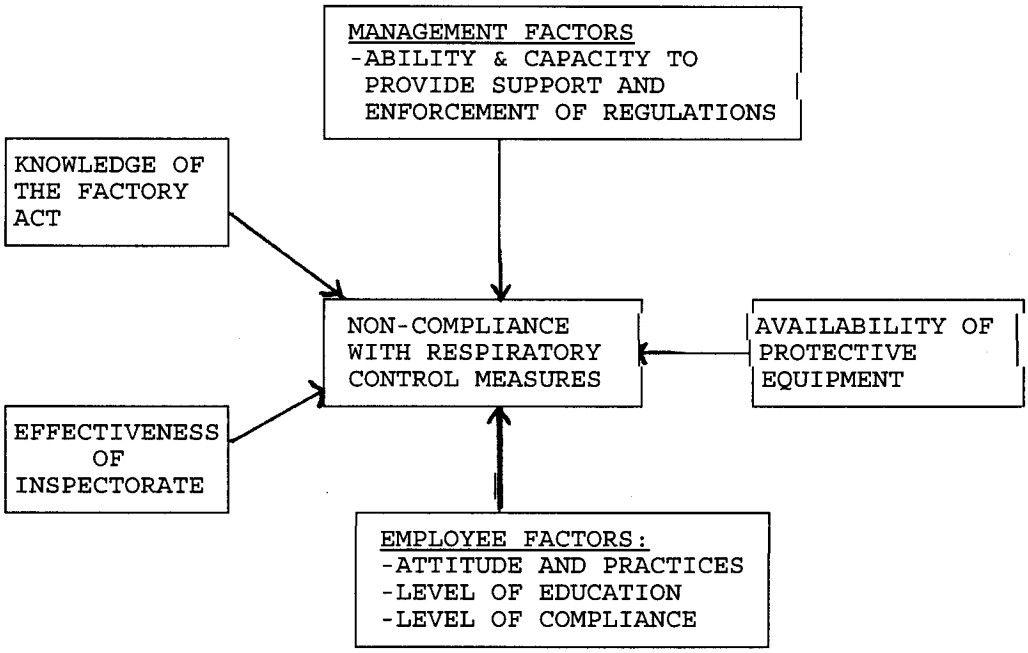
SOURCE: Cairo Road National Milling Company Clinic 1993 Health Statistics.

The above table shows attendances for respiratory problems on a monthly basis from a total workforce of two hundred and eighty seven (287). The table reveals that there were five hundred and twenty nine (529) total attendances for the whole year. These attendances were twice as much as the total workforce which implies that, respiratory problems were much more prevalent which could be attributed to ineffective or non use of protective equipment by the employees. It may also be due to inadequate education on the importance of their use, inability by management to provide adequately, ineffective factory inspectorate to enforce compliance and employees practices and attitude towards proper use of protective equipment.

Therefore, the purpose of this study was to determine factors contributing to non-compliance with the respiratory control measures among millers in Lusaka Urban. The study was designed to answer the research question:- What factors contribute to non-compliance with the respiratory control measures in the milling industry?

VARIABLES

The dependent variable for the study was "Non-compliance with the respiratory control measures". The independent variables are illustrated below:-



1.3 LITERATURE REVIEW

The literature that has been reviewed focusses on the following factors:-

(i) The Factory Act

(ii) The Respiratory Control Measures

(iii) The inspectorate

(iv) The enforcement of the Act

(v) The support by Management

(vi) The employees attitude and practices

1.3.1 THE FACTORY ACT

The early Factory Act legislation of various European nation's industries were induced to organize their working places so as to diminish accidents, improve lighting conditions, ventilation and protect the health of the employees in general (Ridley, J. 1990).

The Danish working Environmental Act of 1975 focus is designed to enable the companies to solve problems relating to the health and safety at work themselves and that management of individual companies is responsible for ensuring that the working environment fulfills the statutory requirements, as well as receive guidance and supervision from labour inspection (Danish Environmental Act of 1975 No.681).

The Swaziland Factory Act does oblige employers to enforce rules and regulations and the difference is the inspectorate aspect where it states that the "Factory inspector shall enter and inspect the factory at any time and without prior notice, but unless authorized by the complainant under this Act shall not divulge the source of any information or complaint regarding any alleged breach of this Act".

The British Act of 1961 is similar to the Zambian Factory Act of 1965 and recommends the same health, safety and welfare regulations in industries.

In order to enforce compliance with OSHA standards, the Factory Act provides for inspection of the premises and penalties of fines for non-compliance. The law also, authorizes inspectors from the Department of Labor to enter any establishment and inspect at any reasonable time and without delay and prior notice. The inspector has authority to inspect whatever, he wishes and may question any employer, owner or operator.

According to the OSHA Act, each industrial establishment is required to conduct periodic sampling and monitoring programs in several areas as an evaluation exercise.

In dusty occupations, the Factory Act states that once the hazard has been identified, dusts or vapors should be prevented from entering the breathing zone of the employee by some form of local exhaust ventilation, removal and dilution of dust by ventilation. The hazard can also be lessened by using wet methods such as water spraying. It further, recommends the use of personal protective clothing, although very often employees complain that protective clothing is uncomfortable to wear (Waldron, H.A. 1985).

1.3.2 THE RESPIRATORY CONTROL MEASURES

All dusts are more or less injurious to health at least when breathed in excess amounts (Danpenspeck, W.A. 1974). A number of control measures as stipulated by the Acts have been recommended in the industry which have been monitored and maintained. Some of these include:

A. **ENVIRONMENTAL METHODS OF CONTROL**

(i) Total closure of the process

(ii) Partial enclosure with exhaust ventilation at the site of emission of the dust or vapor or fumes

(iii) Good general ventilation for removing small quantities of dust

(iv) Wet methods such as water spraying to suppress dust

(v) Good general environmental conditions

(vi) Monitoring the environment to measure the effect that control procedures are achieving

B. **PERSONNEL CONTROL**

(i) Education to be offered to everybody including management

(ii) Adequate hygiene facilities should be provided for employees to wash exposed surfaces

(iii) Personal protection by provision of protective equipment

(iv) Periodic medical examination and screening (Danton, S. 1984)

In U.K., environmental monitoring which involves measurement of airborne contaminants in working environments is needed to the integrity and performance of hazard control systems or to assess the risk to the occupants of the work place. (Baker; L.E. 1990) Another U.K. study conducted in 1990, revealed that increased ventilation may be the only way in which dust levels can be kept below dangerous levels and that personal protection by use of

respirator or breathing apparatus can produce short term protection from times of maximal dustiness (Cotes, E.J. 1989).

In America, the adoption of administrative measures as a respiratory control measure was found helpful as it offered some protection when rotation of workers was introduced in industry so that each worker had less average exposure time than one worker performing a hazardous job for a longer time. (Levy, S.B. & Wegman, H.D. 1988)

A cross section survey in America on respiratory health in swine producers, showed that 30% of the three hundred and one (301) men examined, usually used a dust mask when working inside the barn. This study revealed that employees who wore dust masks for preventive purposes have better respiratory health than those who did not wear dust masks. (Zelda, J.E. & Hurst, T.S. 1993)

1.3.3 **THE INSPECTORATE**

The Factory Inspectors have the power to enter, inspect and examine every part of the factory by day or night (Factory Act CAP 514). In order to enforce compliance with the standards there is a provision by the OSHA Act for inspection and penalties of fines for non-compliance (Pettersen, D. 1989). The approach in OSHA is one of setting comprehensive and specific standards, governmental policing of company practices, work places and enforcement through citations, fines and other penalties (Flippo, B.E. 1980).

In U.K., Factory Inspectors were charged with the enforcement of factory laws and had in addition the duty of persuading the management and workers in factories to reduce hazards. They were also detailed to bring about further development of the new law (Cotes, J.E. & Steel, J. 1990).

However, in Latin American smaller factories, engineering control measures are almost unknown and few standards are applied to limit the work place exposures. These regulations are not enforced due primarily to political and economic reasons and lack of trained inspectors (Levy, S.B. & Wegmann, H.D. 1988).

1.3.4 ENFORCEMENT OF RULES AND REGULATIONS

The provision of protective clothing to employees and close supervision is needed in order to enforce compliance with proper work practices. For example, a worker who is issued and is wearing a respirator may feel adequately protected from all potential hazards in the work place and may therefore neglect the use of engineering controls or may violate control guidelines (La Dou, J. 1990). The enforcement agency is the Occupational Safety and Health Administration which applies to any company. A large part of the safety program should be devoted to the process of educating the employee to act, think and work safely. This can be done by:

(i) induction of new employees

(ii) emphasis of safety points during training sessions

(iii) establishment of employee safety committees

(iv) holding of special employee safety committees

(v) use of company periodicals, charts, posters and displays emphasizing the need to act safely (Flippo, B.E. 1980)

1.3.5 SUPPORT BY MANAGEMENT

Employees are liable financially for all accidents and the occupational diseases arising out of employment regardless of whether the employee was specifically at fault. management must provide a safety program for its workers rather than give lip service in promoting workers' safety at places of work (Flippo, B.E. 1980).

Training should be given to all those who use protective equipment, and management commitment is essential to the success of personal protection schemes. Management should warn employees whose work may expose them to harmful dust. The employees should be given instructions and training in methods of work which will minimize the risk of ill health. They also require supervision to ensure that these instructions are always carried out. In U.K., the Health and Safety At Work Act lays this obligation on the employer and imposes on the employees a duty to co-operate (Cotes, J.E. 1989).

A Netherlands study on respiratory health of the workers exposed to antigens concluded that where there is exposure to airborne antigens medical examination is desirable to look for pre-clinical lung function impairment (Pal, M.T. 1985).

1.3.6 EMPLOYEES ATTITUDE AND PRACTICES

In the work place employees attach more importance to safety and health if they see that management has shown some interest (Ridley, J. 1990).

Control of work practices over the behaviour of individual workers on the job include education and training on the desired practices (La Dou, J. 1990). For example, once protective equipment has been selected, a good fit of the equipment to the person is required, the period of use should be known so that maximum degree of protection will be achieved. The equipment must be voluntarily checked, cleaned and maintained by the user himself (Ridley, J. 1990).

A Swedish study on effectiveness of protective respiratory mask among factory employees revealed reduced exposures by 50 - 92% when protective equipment was used. At the same time the workers said that reasons for not wearing protective equipment were that it delayed and interfered with the work, it was too tight, it was rubbing the skin and that it made breathing difficult as it became too warm (Zelda, J.E. & Dosman, 1991). In the control of occupational hazards employees often do not use protective clothing which is provided for them, they complain that the protective clothing is uncomfortable to wear (Waldron, H.A. 1985).

In Ugandan small scale industries, the employees who worked in hot, stuffy crowded and poorly ventilated rooms with poor

personal hygiene, lack of water and poor house-keeping largely considered the thermal or respiratory discomfort as acceptable side-effects of work (Sekimpi, K.D. 1988).

1.3.7 CONCLUSION

The literature review has shown that, in the enforcement of compliance with the respiratory control measures, knowledge of the Factory Act by all employees and its rules and regulations is important. The adoption of engineering control and administrative measures by management and the control of employee work practices on desired practices should be encouraged through worker education and training. Regular inspections by factory inspectors will ensure acceptable standards of physical, chemical and biological factors arising in or from the work place which may affect the health of the people at work.

1.4.0 OPERATIONAL DEFINITIONS OF VARIABLES AND TERMS

1. ACT: A statute or written law passed by Parliament designed to deal with a service.
2. WORKER/EMPLOYEE: A non-skilled or semi-skilled person assigned to work in the factory plant and is involved in activities such as off loading of raw materials, the milling process, packaging and loading of the finished product etc.
3. MANAGEMENT: These are professional and technical staff who represent the top level and mid level management in the milling company.

4. PROTECTIVE EQUIPMENT: These include clothing and equipment to be worn by employees such as overalls, caps, masks, dust respirators etc.

5. ENGINEERING CONTROLS: These are different methods used to promote and control general ventilation or suppress dust in the factory plant; such as use of fans, ventilators, water sprays etc.

6. NON-COMPLIANCE: Implies employees not using protective equipment or the management not providing regular and adequate protective equipment to the employees.

7. MILLERS: All persons employed to work in the milling industry.

CHAPTER 2

2.0 OBJECTIVES OF THE STUDY

2.1 GENERAL OBJECTIVE

To establish the contributing factors to non-compliance with the respiratory control measures among Lusaka Urban Millers.

2.2 THE SPECIFIC OBJECTIVES

1. To determine management's attitude and practices towards occupational health and safety.

2. To determine management's ability and capacity to provide support for their employees.

3. To establish problems experienced by millers in dealing with occupational safety and health.

4. To establish the employees compliance with use of protective equipment.

5. To determine effectiveness of inspections by factory inspectors.

6. To make recommendations.

2.3 INDICATORS AND CUT-OFF POINTS

1.0 DEPENDENT VARIABLE			CUT-OFF POINTS
1.1 Compliance with respiratory control measures	3 points	=	If suitable protective equipment is supplied regularly
		=	If employees using suitable protective equipment
	2 points	=	If protective clothing is provided with improvised dust respirators (mutton cloth)
		=	If employees using the provided protective clothing
	1 point	=	If unsuitable protective equipment is provided and employees only using protective clothing

2.0 INDEPENDENT VARIABLES		
2.1 Support by management	3 points	• If able to provide suitable protective equipment regularly (masks, overall, etc)
		• Conduct induction courses and training regularly
		• Maintain general cleanliness, adequate ventilation and no overcrowding in work-rooms

				CUT-OFF POINTS
		2 points	•	If able to provide protective clothing
			•	Conduct induction course and training sometimes
			•	Conduct medical examinations for new employees
			•	Maintain some cleanliness and ensure ventilation
		1 point	•	If able to provide some protective clothing
			•	If able to maintain some cleanliness and ensures ventilation
2.2	Employees' practice or compliance	3 points	•	If uses suitable protective equipment all the time
		2 points	•	If uses only protective clothing (overall)
		1 point	•	If uses protective clothing sometimes
2.3	Effectiveness of Inspectorate	3 points	=	If inspections conducted regularly i.e. 6-12 months and rules and regulations complied with by Companies
		2 points	=	If inspections conducted at least yearly and some rules and regulations are complied with by companies

CUT-OFF POINTS

1 point	=	If inspections are rarely conducted such as after a lapse of a year and above or when called upon by Companies

CHAPTER 3

3.0 METHODOLOGY

3.1 RESEARCH DESIGN

The research was aimed at determining factors contributing to non-compliance with the respiratory control measures in milling companies in Lusaka Urban. This was a descriptive study with a qualitative component. Descriptive because it involved systematic collection of data to give a clear picture of the phenomena under study. The two components were used because some variables were measurable and some were not. The qualitative dimension was applied to those variables which were not measurable, such as employees attitude and employers attitude and enforcement of regulations. This dimension involved identifying and exploring variables that gave insight in the nature of factors that contribute to non-compliance with respiratory control measures.

3.2 RESEARCH SETTING

The study was conducted in three of the six registered milling companies which were randomly selected by lottery method. Names of all the six companies were each written on a piece of paper which were folded, put in a box which was thoroughly shaked and then one folded paper was picked one at a time until all the three names of the companies were selected. The following were selected, Robin Hood products, Ghiradi Milling and National Milling Cairo Road Plant.

The set up of all the milling companies include the administration block which houses the top management, mid level management and other supportive staff. Then there is the factory plant where production takes place. The administration block is headed by the General manager who oversees the whole management of the company. Below him is the Chief Accountant who is the Financial Controller of the Company, then there is the Technical Manager who supervises maintenance section and the Production Manager who is responsible for the operations in the factory plant.

In bigger companies, there is the Purchasing Officer, Sales Officer, Safety Manager etc., but in small companies the purchasing functions are done by the Accountant and the Production Manager supervises maintenance work. There is also a Human Resources Head. There are two major categories of staff, the management or non-represented staff, the unionised or represented junior staff. Below is a table showing the study population for the study and the names of the selected companies.

TABLE 2: THE NAME OF COMPANY AND NUMBER AND TYPES OF STAFF

NAME OF COMPANY	TOP MANAGE-MENT STAFF	OTHER SUPPORTIVE STAFF	PLANT FACTORY STAFF	TOTAL
NATIONAL MILLING	95	61	59	215
GHIRADI MILLING	23	28	46	97
ROBIN HOOD PRODUCTS	14	16	33	63
TOTAL	132	105	138	375

The plant factory workers operate a three-eight hours shift in twenty four hours or a two-twelve hour shift depending on the company policy.

The plant factory comprises the off loading bay for incoming raw materials, the processing section where screening, sieving, conditioning and milling processes are conducted, then the packaging and warehouse sections for storage of the finished products before dispatch to various destinations.

The operations process start with the off-loading of the raw materials i.e. either maize grain or wheat grain. This is uptaken through the elevators for screening where bigger impurities are removed, then they are taken to the storage bins. The grain is then taken up into the elevators to the separator or sieve where metallic pieces are removed by magnet and further impurities of grain are removed too. The grain is then taken to the conditioner before being grind, milled, sieved and packaged then stacked in the warehouse.

There is also a first and room or a company Clinic depending on the size of the company where patients are screened and treatment for minor injuries and other ailments are given.

Lusaka-based companies were chosen because of their proximity to the institution of learning. And secondly it was important because of the limited time in which the study had to be conducted and submitted to the department of Post-Basic Nursing.

3.3 SAMPLE SELECTION AND APPROACH

3.3.1 SAMPLE 1

The sample consisted of three management representatives, one from each of the three selected milling companies. Simple random sampling was used to pick the respondents for the study where more than one representative involved in safety management were found. An available sample was picked where only one management representative dealing in safety management was found. The purpose of this sample was to obtain data on management's attitude and commitment towards the safety and health of the employees as well as to determine the ability and capacity to provide support and enforcement of the regulations.

3.3.2 SAMPLE 2

The sample consisted of fifty (50) respondents from a target population of one hundred and thirty eight (138) from the three milling companies, and these were the plant factory employees. A proportionate stratified method was used to select the respondents. This method applies when a uniform sampling fraction is used to draw sampling units from the stratified sample. The method was chosen because already existing knowledge of the population was used to divide it into groups such that the respondents in each group were more alike than were the respondents in the whole population. Therefore, using the formular $F = \frac{n}{N}$, the following were the sample units selected from each milling company. $F = \frac{n}{N} = \frac{\text{size of the sample}}{\text{size of the population}} = \frac{50}{138} = 0.36$

$= \underline{0.36}$

1. National Milling: Population 59 x 0.36 = 21.24 = 21 respondents
2. Ghirardi Milling: Population 46 x 0.36 = 16.56 = 17 respondents
3. Robin Hood Milling: Population 33 x 0.36 = 11.88 = 12 respondents

TOTAL	50

After the sample size was determined, then a simple random sampling method using the lottery technique was used to select the sample units. Each employee was given a non-probability of being included in the study.

The employees who were found to be off duty were not included in the study, and other respondents were randomly selected until the required sample were selected for each company.

The purpose was to elicit data on the employees work attitude and practices toward the laid down rules and regulations and their level of compliance as well as determine factors contributing to non-compliance with the respiratory control measures.

3.3.3 FACTORY ACTIVITY OBSERVATION SCHEME

Three observations of employees activities in the factory plant during their routine operation hours were conducted.

The observations were also made on general cleanliness of the premises, ventilation system, use of protective equipment by the employees, display of the Factory Act within the premises, the wash rooms and any identified respiratory hazards in the industries.

Observations are a technique that involves systematically selecting objects or phenomena. Non-participant observation was conducted on the employees' working practices and recorded their behaviour. Also a general inspection of the factory by a walk through was conducted and observed phenomena were recorded. This was used to collect data on quality or standards of practice as performed by employees as well as determine other control measures used.

3.4 DATA COLLECTION TECHNIQUE

To facilitate data collection, a self-administered questionnaire was used to collect data from the management representatives. A structural interview schedule was used to collect data from the factory plant employees. The researcher also used a factory activity observation scheme in order to collect data which could not be collected by other techniques mentioned above.

3.4.1 SELF-ADMINISTERED QUESTIONNAIRE

The questionnaires were administered to one management representative of each of the three companies. The questionnaires consisted of both open-ended and close-ended

questions. The questions were designed to elicit data on management's attitude, and commitment towards laid down rules and regulations in order to ascertain some factors contributing to non-compliance with the respiratory control measures.

This method was used because respondents remained anonymous as their names were not included and this encouraged truthfulness. At the same time, following the distribution of the questionnaire, the researcher concentrated on other activities such as the observation of workers and conducted the inspection of the factory before conducting employee's individual interviews. In order to control for the limitations of the self-administered questionnaire such as low rate of response and misunderstanding of the questions, the researcher used more close-ended questions which offered options from which the respondents chose and thus allowed for any additionals.

3.4.2 A STRUCTURED INTERVIEW SCHEDULE

A structured interview schedule was administered to each of the fifty (50) factory plant employees from the three companies. It was designed to elicit data on the employees' attitude and practices about respiratory control measures in the milling industry as laid down by the Factory Act, as well as establish management's attitude and level of support for the employees' towards their health and safety.

A structured interview schedule was considered appropriate for this study because of a high response rate since the

researcher conducted the interview, filled in the responses and collected the questionnaires at the end of the interview. The method was found helpful because it also permitted for clarification of questions which were not clear to the respondents.

In order to control for the limitation of the structured interview schedule such as influence the response by the interviewer's presence, the researcher obtained consent and assured confidentiality of whatever responses as well as explained the purpose and importance of the study.

3.5 ETHICAL CONSIDERATION

The researcher obtained permission to conduct the interviews and distribute questionnaires as well as to conduct an inspection from the authorities of each of the three companies. Individual consents were obtained from the respondents and confidentiality was assured after a brief verbal explanation of the purpose of the study.

3.6 PRE-TEST OF DATA COLLECTION TOOLS

The pre-test was carried out at Kamwala Milling Branch which was not included in the study. Before the interviews the researcher explained the purpose of the interview to the respondents and verbal consent was sought. The questions were translated into the local language for those who were not fluent with English.

Following this exercise some responses to some close-ended questions were rephrased for easy understanding by the respondents and additional responses and wording were constructed.

There were no major changes made on the questionnaire for management representatives. There were also some Yes and No responses added to the factory observation scheme.

3.7 LIMITATIONS OF THE STUDY

The sample size was small because of the limited time in which data were to be collected and the study completed for submission to the Department of the Post Basic Nursing.

CHAPTER 4

4.0.0 DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1.0 DATA ANALYSIS

Data were sorted out according to the tools used. In order to control for quality, the questionnaires and interview schedules were checked for completeness and any mistakes were corrected before leaving the company premises. Responses to close-ended questions were entered on a data master sheet while responses from open-ended questions were first categorized, coded and then entered on the data master sheet. The data were analyzed manually with the aid of a pocket calculator. It was then summarized in the form of tables. Cross tabulations were done for some variables and then frequency counts and percentages were done. This made interpretation of findings easier and allowed presentation of data in a meaningful way.

4.2.0 PRESENTATION OF FINDINGS FOR MANAGEMENT

Three questionnaires were distributed to three company representatives. All the questionnaires were answered and collected. The data were analyzed and presented in non-table form to facilitate interpretation of findings.

4.2.1 DEMOGRAPHIC CHARACTERISTICS

Out of the three respondents, there were two males who were all married and one female who was single. The age range of the respondents was between twenty-five and forty (25 - 40 years). They had all attained higher level of education, two have

University Degrees and one has a College Diploma Certificate. From the two graduates one is a General Manager and another is a Quality Assurance Manager whilst the Diploma holder is a Head of Human Resources. All the three companies have been in existence for more than eleven years (11 years). And the two male respondents have worked for their respective companies for less than five years while the female respondent has worked for the company for more than six (6) years. One company has a total number of workers exceeding one hundred and fifty (150 +) and two of the companies had between fifty one and one hundred (51 - 100) workers.

4.2.3 MANAGEMENT OF MAJOR OCCUPATIONAL AND SAFETY PROBLEMS

All the three companies experienced some problems. The company that experienced problems with inadequate trained human resources to conduct training for the employees provided the following:-

(i) Provision of safety program for employees.

(ii) Gave instructions and training of employees in methods of work to minimize risk to ill-health.

(iii) Closely supervised employees to ensure that the instructions were followed.

Another company that experienced problems with inadequate funds to conduct training regularly did the following:-

(i) Provision of a safety program for employees.

(ii) Gave instructions and training of employees in methods of work to minimize risk to ill-health.

(iii) Closely supervised the employees to ensure that the instructions were followed.

The other company had problems of inadequate funds to conduct training and periodic medical examinations for employees and only managed to do periodic medical examinations and screening of new employees.

4.2.4 MANAGEMENT OF IDENTIFIED RESPIRATORY HEALTH HAZARDS

Out of the three companies, one identified inadequate waste disposal and managed by ensuring that general cleanliness of the premises was maintained. One company identified overcrowding in the workrooms and managed to ease the problem by ensuring adequate ventilation. The other company identified non-availability of 'gas masks' in the country and thus provided the workers in most dusty areas with a pint (500 mls) of milk daily.

In order to minimize exposure of the employees to risk health hazards such as operating in maximal dusty areas, two of the companies recommended an eight (8) hour shift per day per worker. One company recommended eleven (11) hours per shift three times per week per employee.

4.2.5 LACK OF PROVISION OF A CLINIC

Two of the companies did not provide Clinics for their employees and only had first aid rooms. Reasons given were that one company could not provide a Clinic because of the small workforce and instead provided a medical insurance scheme for the

4.3.0 **FINDINGS FROM EMPLOYEES**

The fifty (50) respondents in the study that were interviewed were all male employees working in the factory plants of the three companies.

TABLE 3: DEMOGRAPHIC CHARACTER STICS OF RESPONDENTS

CHARACTERISTICS OF RESPONDENTS		NUMBER OF RESPONDENTS	TOTAL %
SEX	MALE	50	50 (100)
	FEMALE	00	00 (00)
MARITAL STATUS	SINGLE	03	03 (06)
	MARRIED	47	47 (94)
AGE RANGE	21-30 YEARS	25	25 (50)
	31-40 YEARS	16	16 (32)
	41 +	09	09 (18)
EDUCATIONAL LEVEL	NIL	06	06 (12)
	PRIMARY	32	32 (64)
	SECONDARY	08	08 (16)
	COLLEGE	04	04 (08)
YEARS OF SERVICE	01-05 YEARS	21	21 (42)
	06-10 YEARS	15	15 (30)
	11 +	14	14 (28)

Majority of respondents (94%) were married and (50%) were young men aged between 21-30 years (50%). Most of them had attained primary level of education (64%). (42%) had only worked for a minimum period of between 01-05 years.

TABLE 4: EDUCATIONAL LEVEL IN RELATION TO YEARS OF SERVICE IN THE COMPANY

EDUCATIONAL LEVEL				YEAR OF SERVICE			TOTAL %
NIL	PRIMARY	SECONDARY	COLLEGE	01 - 05	06 - 10	11+	
00	32	00	00	14	09	09	32 (64)
00	00	08	00	03	04	01	08 (16)
00	00	00	04	04	00	00	04 (08)
06	00	00	00	00	02	04	06 (12)
06	32	08	04	21	15	14	50 (100)

The majority (64%) of respondents who had attained primary level of education had also worked for a minimum number of years (01-05 years).

TABLE 5: YEARS OF SERVICE IN RELATION TO AGE DISTRIBUTION OF RESPONDENTS

YEARS OF SERVICE	AGE RANGE			TOTAL %
	21 - 30	31 - 40	41+	
01 - 05 Years	19	02	00	21 (42)
06 - 10 Years	06	05	04	15 (30)
11+	00	08	06	14 (28)
TOTAL	25	15	10	50 (100)

The majority of respondents (42%) had worked for a minimum number of years of whom (38%) were young men aged between 21-30 years.

TABLE 6: OCCUPATIONAL SAFETY SERVICES PROVIDED BY COMPANIES

SAFETY SERVICES PROVIDED	NAME OF COMPANY			TOTAL
	R.G.M. (n=12)	G.M. (n=17)	N.M. (n=21)	
Induction Course For New Employees	01	04	06	11
Periodic Medical Examn & Screaning	02	04	02	08
Provide Protective Equipment	12	17	21	50
Conduct Med/Exams for New Employees	01	02	05	08
Provision of a Safety Program	00	01	00	01

All 50 respondents were provided with protective equipment. Only one company had provision for a safety program.

TABLE 7: TYPE OF PROTECTIVE EQUIPMENT PROVIDED & FREQUENCIES n=50

TYEPE OF PROTECTIVE EQUIPMENT	FREQUENCY	TOTAL
Protective Clothing (Overall, Caps)	A Pair Once a Year	50
Mutton Cloth	Whenever Necessary	10
Masks	Whenever Necessary	01
Dust Respirators	Whenever Necessary	01

All 50 respondents were provided with protective clothing. Mutton cloth and dust respirators and masks were provided to very few respondents.

TABLE 8: EDUCATIONAL LEVEL IN RELATION TO REASONS GIVEN FOR USE OF PROTECTIVE EQUIPMENT

EDUCATIONAL LEVEL	REASONS GIVEN FOR USE OF P/EQUIPMENT			TOTAL (%)
	PROTECT AGAINST DUST	COMPANY POLICY	CANNOT USE OWN CLOTHES	
NIL	03	02	01	06 (12)
PRIMARY	03	08	02	32 (64)
SECONDARY	05	02	01	08 (16)
COLLEGE	02	01	01	04 (08)
TOTAL	32	13	05	50 (100)

The majority of respondents (64%) regardless of their educational

level considered protection against dust as the main reason for use of protective equipment.

TABLE 9: EDUCATIONAL LEVEL AND REASONS GIVEN ON WHETHER OR NOT PROTECTIVE EQUIPMENT IS SUITABLE FOR THE TYPE OF WORK

EDUCATIONAL LEVEL	REASONS GIVEN WHETHER OR NOT PROTECTIVE EQUIPMENT SUITABLE					SUITABLE	
	Protect Against Dust	Wears Off Fast	Are Strong	Do Not Know	Incomplete No Mask	YES	NO
Nil	04	02	00	00	00	04	02
Primary	26	03	00	01	02	26	06
Secondary	04	01	01	01	01	05	03
College	03	00	01	00	00	04	00
Total	37	06	02	02	03	39	11

The majority of respondents (74%) regardless of the educational level considered protective equipment suitable because it protected them against dust. The less educated respondents regarded protective equipment as not being strong.

TABLE 10: SUGGESTED SOLUTIONS FOR PROVISION OF PROTECTIVE EQUIPMENT

R E C O M M E N D A T I O N S	NUMBER OF RESPONDENTS	TOTAL
PROVIDE 3-4 PAIRS PROTECTIVE CLOTHING	50	50
PROVIDE MASKS	04	04
PROVIDE MILK DAILY	02	02

All the respondents recommended an increase of 3-4 pairs of protective clothing.

TABLE 11: YEARS OF SERVICE IN RELATION TO REASONS GIVEN FOR LACK OF CLINIC (n=29)

REASONS FOR LACK OF CLINIC	YEAR OF SERVICE			TOTAL %
	01 - 05	06 - 10	11+	
Does Not Know What Management Thinks	06	05	00	11 (37.03)
No Opinion Expressed	03	04	02	09 (31.03)
Lack of Funds	03	01	00	04 (13.79)
Management Does Not Care	01	01	00	02 (06.80)
Management is Selfish	01	01	00	02 (06.80)
Expensive To Run Clinic	01	00	00	01 (03.40)
Total	15	12	02	29 (100)

The majority of respondents (37.03%) who had worked for less than 11 years did not know why management was unable to provide a Clinic. Two of the respondents who had served for more than 11 years did not express any opinion. 21 (42%) of the employees were provided with a Clinic in one Company.

TABLE 12: RESPONDENTS' EDUCATIONAL LEVEL AND REASONS GIVEN IN RELATION TO COMPANIES INADEQUATE PROVISION FOR OCCUPATIONAL HEALTH AND SAFETY

RESPONDENTS REASONS	EDUCATIONAL LEVEL				TOTAL %
	NIL	PRIMARY	SECONDARY	COLLEGE	
Inadequate Trained Personnel	03	06	01	01	11 (22)
Do Not Know	02	15	02	00	19 (38)
Management Does Not Care	00	17	02	01	10 (20)
Lack of Funds	00	02	02	01	05 (10)
Selfish Management	00	02	01	01	04 (08)
Weak Union	01	00	00	00	01 (02)
TOTAL	06	32	08	04	50 (100)

The majority of respondents (38%) most of whom had attained primary level of education did not know why management was unable

to deal with occupational health and safety.

EMPLOYEES HOURS OF WORK

The majority of the employees worked for 8 hours per day (64%), (26%) worked for 12 hours per day while only (10%) worked for more than 12 hours per day.

4.4.0 FACTORY ACTIVITY OBSERVATION SCHEME

Observations of the employees activities in the factory plants were done from 6th June to 8th June, 1994. Three observations were done, one per day for each of the three companies. The researcher obtained the required data with the help of a self-designed factory activity observation scheme guide. The results obtained were as follows:-

4.4.1 DISPLAY OF THE ACT

Only one company out of the three companies visited had the abstract of the Factory Act displayed.

4.4.2 GENERAL CLEANLINESS OF FACTORY PLANTS

Two of the three companies visited maintained a generally clean environment. The premises were swept clean, there were no collection of any maize or wheat grain waste around and there was minimal collection of dust powder in the workrooms. The other company had an excess of dust powder in the workroom and the premises were littered with assorted waste such as maize grain waste; rugs, etc.

4.4.3 VENTILATION IN THE FACTORY

Of the three companies visited, only two of them had adequate ventilation i.e. all the ventilators were working as compared to one of the companies which had inadequate ventilation as most of the ventilators were non-operational and this contributed to the excess dust powder collection in the workroom.

4.4.4 USE OF PROTECTIVE CLOTHING

Almost all the employees in the factory plants had their protective clothing on i.e. overalls, caps, but they had no masks or dust respirators to protect them against inhalation of excess dust. Even those employees in most dusty areas had no masks except a few who had mutton cloth used as substitute for the masks.

In one company some employees did not have safety shoes and were operating in their own shoes, others were barefooted. In the same company the part-time employees were not even provided with protective clothing but were instead using their own clothes.

4.4.5 IDENTIFIED RESPIRATORY HAZARDS

Out of the three companies observed, only one company was found with generally dirt premises, there was an accumulation of excess meal dust all over the plant, poor waste disposal and poor ventilation system as compared to the other two companies which maintained generally clean and safe standards.

4.4.6 GENERAL COMMENTS

Generally, there was no overcrowding in all the factory workrooms and they all had wash and change rooms for employees to wash after work and change into clean clothes.

5.0 CHAPTER 5

5.1 DISCUSSION OF FINDINGS

The aim of undertaking the study was to determine the ontributing factors to non-compliance with the respiratory control measures among Lusaka Urban Millers.

Three types of instruments were developed and administ red. A questionnaire for sample one for the management represent tives, a structured interview schedule for sample two for the plant factory employees and a factory observation scheme guide.

The factors that the study looked at included:-

(i) Management's attitude toward occupation health and safety.

(ii) Management's ability and capacity to provide support for their employees.

(iii) Problems experienced by millers in dealing with Occupational health and safety.

(iv) Employees' compliance with the use of protective equipment.

(v) Effectiveness of inspections.

5.1.1 MANAGEMENT'S ATTITUDE AND PRACTICE TOWARD OCCUPATIONAL HEALTH AND SAFETY

In this study all the managers had attained higher education. They were therefore expected to be more knowledgeable about the Factory Act rules and regulations concerning occupational health and safety than the employees. This would assist them to adopt a positive attitude toward the safety of the employees.

The findings showed a negative attitude in one company. This was demonstrated by poor house-keeping practices as revealed by excessive accumulation of dust powder in the workrooms and the generally appalling state that the whole factory surrounding was in. This was not expected because general cleaning could have been done by workers without use of complicated equipment or spending a lot of money. The results also reveal that management was less concerned about the state of the factory premises and the effect that this would have on the workers, who were constantly exposed to such an unhygienic environment.

In accordance with the practice of occupational health and safety, the employer should maintain the general cleanliness of the factory. This should be achieved if management is showing interest in the workers by conducting factory inspections so that they themselves identify abnormal conditions, assess the conditions by comparing them with relevant recommended standards. When the conditions are found not to be satisfactory improvement should be made to them so that they subsequently comply with the standards.

The findings in the other companies revealed a positive attitude by the management which was demonstrated by the well maintained standards of the whole factory premises.

Franklyn, G; (1990) states that the real risk today for the safety of employees consists of enlisting management support, motivating supervisors and educating workers; without this there will be lack of understanding by employees about the nature or severity of the hazards surrounding them resulting in non-compliance.

Lack of worker education by management was indicated by the employees when only 22% acknowledged having undergone induction course on recruitment (Table 6). If training is not possible due to financial constraints, induction course on recruitment should be done for all the employees so that the right knowledge on occupational health and safety is acquired by each worker before he/she is exposed to malpractices in the work place.

The negative attitude on the other hand was not due to lack of means to provide support but could probably be lack of adequate knowledge by management on the need to maintain recommended standards of hygiene. This therefore implies that management should undergo induction course or short training in occupational health and safety. This will enable managers to take appropriate action to promote workers health and safety.

Findings in this study were similar to what was observed by

Sekimpi, K.D. (1988) who found that in Ugandan Small Scale Industries where employees who worked in hot, stuffy crowded and poorly ventilated rooms with poor personal hygiene, largely considered these as acceptable side effects of work.

In developing countries, Zambia included, where there is high unemployment rate and massive work redundancies, workers would not be expected to express their dissatisfaction about the unsafe working conditions for fear of victimization and subsequent loss of the job. Besides the results of the study revealed that majority of workers (64%) had low level of education (table 3) and had less skilled jobs which makes their job prospects quite difficult.

There is however, one major factor that may to a large extent influence the negative attitude. The lack of adequate funds in general explains why it was observed in one company where part-time workers were not provided with protective clothing like their fellow full-time employees. Yet they were all doing the same type of work and were exposed to the same hazardous working conditions.

The lack of concern on the part-time employees was a very unfortunate situation because their health was at risk. Such findings were unexpected as they are a clear indication of negativism on the part of management. It is important that personal protective equipment is used effectively against risk, especially where the working conditions are a risk factor.

Therefore all workers, irrespective of whether they are part-time or full-time employees exposed to risks should be provided protective clothing. This is supported by La Dou, J. (1990) who states that there is a need to provide protective clothing to employees and close supervision done so as to enforce compliance with proper work practices.

5.1.2 MANAGEMENT ABILITY AND CAPACITY TO PROVIDE OCCUPATIONAL HEALTH SUPPORT FOR EMPLOYEES

Findings on management's ability and capacity to provide support for the employees were found to be favourable in two companies and less favourable in one. This was because despite all the companies having ability to provide and put in place the engineering control measures, such as ventilation system which extract or dilute air borne contaminants (dust powder) in order to reduce its concentration and protect the workers, these were not operational in one company except for the two companies. This explains why there was excessive dust powder accumulation in the work rooms. These unsatisfactory working conditions were not expected and can lead to a worker being under undue stress and perform below par, thus allowing normal vigilance lapse.

However, education and training of workers and management on the hazards of the work and the use of the best procedures to minimise the risk could improve the situation.

In order to reduce worker exposure to the harmful dust, all the companies adopted standard administrative measures by

rotation of workers and reduced working hours. This was shown by the majority of employees (64%) who worked for eight (8) hours per day as compared to other employees (26%) who worked for twelve (12) hours per day. This was an expected phenomena because in order to promote total health i.e. physical and mental health, the workers need to take adequate rest off work in order for them to perform better the following day.

Despite financial problems that all the companies were experiencing, they were able to provide at least a pair of protective clothing per year to all the employees (100%). But they could not provide adequate suitable respiratory equipment (dust respirators) and instead improvised mutton cloth to some employees (20%). There were only a negligible number of employees (4%) that were provided dust masks (Table 7), this was not expected because masks are an important device in the milling industry since there is given off a lot of dust inside the plant.

Regardless of the financial problems, all the companies were able to provide their workers with either a clinic or first aid room. The study revealed that twenty one (42%) of workers had access to a Clinic, while twenty nine (58%) had access to a first aid room (Table 11). This was an expected phenomena and shows that management were aware about potential health problems that might affect the workers in their work place and would thus require medical attention. This is also important because the health professionals in the Clinic or first aid room will be able to provide guidance for identifying work place hazards, advice

workers and management appropriately on matters related to occupational health.

5.1.3 PROBLEMS EXPERIENCED BY MILLERS IN DEALING WITH OCCUPATIONAL HEALTH AND SAFETY

The problems experienced by the millers in dealing with occupational health and safety were largely due to financial constraints as earlier stated. This was revealed by management when they all expressed lack of funds as the main problem affecting their ability to deal adequately with occupational safety services, such as inability to conduct induction course and training for workers (Table 6). This indicates that workers may lack adequate knowledge on any general or specific matters affecting their health and safety at work. In view of this, it is important that management should find means of providing information to all employees about matters affecting their safety at work.

Management were also not able to conduct medical examinations for the workers (Table 6), thus the workers could not be screened for any health problems arising from work. Therefore management should consider group surveillance for all workers at special risk in order to detect early any occupational diseases.

The formation of safety committees where there are non-existent, and reviving them where they are already in existence, will help enhance and present the employees in consultation with management on health and safety matters.

The other factor affecting worker education was the lack of trained occupational safety personnel (Table 12) who would be able to conduct training for workers. In Zambia the field of occupational health and safety has been a neglected area therefore, it was expected that properly trained occupational safety personnel would not be found in these companies. This implies that if there are not enough trained personnel to conduct training for workers, then there should be close supervision of workers in their work areas so that instructions on safe work practices are followed.

Supervision and training will also minimise health risks to the workers, as was stated by La Dou, J. (1990) that control of work practices over behaviour of individual workers on the job include education and training on the desired safe practices.

5.1.4 EMPLOYEES COMPLIANCE WITH THE USE OF PROTECTIVE EQUIPMENT

According to the study findings all employees (100%) were provided protective clothing, out of whom only a few (20% and 4%) were provided mutton cloth and dust respirators respectively (Table 7). Out of all the employees provided with protective clothing, the majority (64%) of them acknowledged using them. This was regardless of their educational level and reasons given for the use of protective clothing were as follows:

(i) Protected them against dust (74%).

(ii) It was company policy (26%).

(iii) Could not use own clothes (10%), (Table 8, 9).

This means that the workers did not need to be given instructions on the importance of use of protective clothing because they were all aware of the reasons why they should use protective clothing while on duty. It was expected that workers would comply to the use of protective clothing since they feared to stain their out door clothes. These findings also revealed that there was no relationship between compliance to use of protective clothing and employees' level of education.

However, it was also observed that not all of the employees (20%) that were supplied with mutton cloth were seen using them; while none of the employees that were supplied with dust respirators (4%) were seen using them. Failure to use respiratory equipment by employees was expected because most workers rarely like using safety equipment that is uncomfortable to wear especially in stuffy conditions.

Findings in this study were similar to what was observed by Zelda and Dosman (1991), who found out that factory employees could not use protective equipment (dust respirators in particular) as it delayed and interfered with their work.

This situation requires reinforcement of positive behaviour among employees. They ought to be closely supervised and encouraged to use masks in order to reduce the risk of dust inhalations. Companies should try by all means to get some supplies of respiratory equipment from somewhere or find alternatives for their workers. This should be followed by an

induction course, if not a practical demonstration on how to use the equipment in the actual work situation should be done as well as put up penalties for non-compliance.

5.1.5 EFFECTIVENESS OF INSPECTIONS

The Factory inspectors have the power to enter and examine every part of the factory by day or night (Factory Act Cap 514 of the Laws of Zambia). The inspectors visit factories and work places to ensure that the Legislative Act is effective.

The researcher had expected to find that all companies were visited at least once a year. The study findings revealed that two companies were regularly visited by the inspectors, the last visits having being made in January, 1994. It was reported that the other company was only visited when it renewed its manufacturing licence.

The results showed that the company that was never visited routinely maintained a highest level of hygiene. This may explain the reason why the inspectors never visited them routinely which implies that inspectors would like to visit companies that might have occupational hazards to inspect and report on. This is so because of lack of time and the many companies that they ought to visit.

Of the two companies that were regularly visited one company did not maintain the required hygienic standards in the work rooms and the general environment. These falling standards were

not expected and seem to suggest that if the inspectors had inspected the factory and only advised corrective measures,then management did not take corrective measures. This may give an impression that inspections were less effective,when in actual fact this was not true.

It is therefore, important that inspectors follow what was observed by Petersen, D, (1990) that in order to enforce compliance with the standards there is a provision by the OSHA Act for inspections and penalties of fines for non compliance. General surprise inspections or follow-up inspections ought to be conducted to check on corrections. This was also supported by Cotes, J.E. (1989) who explains that any unsatisfactory aspects noted during inspections should be re-examined to check on corrections in light of retrospective and prospective environment measures.

5.2 SUMMARY OF FINDINGS

The main aim of this Study was to determine factors contributing to non-compliance with the respiratory control measures among Lusaka Urban Millers.

A review of the factory inspectors' reports in the Ministry of Labour revealed that companies did not comply with the laid down Factory Act regulations on respiratory control.

It was hoped that the findings of the study would help improve the situation through the recommendations that would be made.

The literature review was based on issues such as the Factory Act and its regulations on respiratory control measures, the employees' attitude and practices and the support rendered by management.

The study was descriptive in nature and was conducted in three of the six registered milling companies which were randomly selected.

A self-administered questionnaire was used on sample one of the three management representatives.

A structures interview schedule was used on sample two of fifty (50) employees working in the factory plants.

A factory activity observation scheme was used by the researcher as a non-participant observer.

Data were collected between 6th and 19th June, 1994 and were analyzed manually with the aid of a pocket calculator.

The findings of the study revealed the following, as problems which affected the non-compliance with respiratory control measures:-

(i) Lack of adequate funds.

(ii) Inadequate trained personnel to deal with occupational safety.

(iii) Lack of workers education and training in occupational safety.

(iv) Inadequate supply of suitable protective equipment for employees.

(v) Ineffective communication between the inspectorate and companies.

5.3 THE IMPLICATIONS OF THE FINDINGS FOR THE HEALTH SYSTEM

The findings of the study showed that the employers in all the three companies were unable to provide suitable protective respirators to the employees and as such employees were exposed to inhalation of excessive dust.

The findings also revealed that all the three companies were unable to monitor the health of the employees in that routine medical examinations and screening of workers were not conducted. This implies that the employers were less concerned about the health and safety of the employees.

The study also revealed that there was minimal worker education. There is need for management to embark on worker education so as to promote safe work standards and thus promote workers' health.

The inspectorate should also realise that in order to promote safe work standards and enhance the workers health and safety, they should work hand in hand with the employers through Safety Health Committees, as well as visit companies at least two times a year.

CHAPTER 6

6.0 CONCLUSION AND RECOMMENDATION

6.1 CONCLUSION

The study findings revealed that the supply of protective clothing is complied with by all employers of the three companies as all employees acknowledged being provided and using protective clothing.

The results at the same time indicated that suitable respirators are not being provided to the employees except for a negligible number. This could be attributed to non-availability of the equipment in the country as reported by one company.

Despite the ability by companies to provide protective clothing to the employees, the major problem that all the companies were experiencing was the financial problem that was adversely affecting other occupational safety services.

6.2 RECOMMENDATIONS

6.2.1 In order to increase the employees' and employers' knowledge and improve understanding on occupational health and safety, Employee Safety Committees should be re-activated where they are already existing. These may be formed to fulfil various occupational needs within the organisation.

Members to include management representative, employee union representative, occupational health workers, factory inspectors, members from other agencies such as the Zambia Federation of Employers etc. The committee should work hand in hand with management of the various companies, and put the following in place.

A. SHORT TERM STRATEGY

(i) Management should produce easy to read safety manuals for various levels of employees such as charts, posters etc. In case of posters they should be frequently changed to stimulate safety awareness.

(ii) Management should organise seminars for millers to sensitize and create awareness among members.

B. LONG TERM STRATEGY

(i) Management should incorporate worker education and training on occupational safety and health on the work plan calendar in order to provide knowledge and promote employees safety.

(ii) Management to initiate employee health monitoring service by conducting medical examinations and screening; as follows:-

(a) Pre-placement examinations should be done,

- to assess fitness for the job and make base line information on fitness.
- to detect ill-health which may be remedied to allow applicant to do specified job or job adjusted to allow performance by the applicant in current state of health.

(b) Periodic examination should be done on employees who are in specific hazardous areas to detect early any ill-health arising from the work-place and thus prevent disease progression.

6.2.2 All the companies should ensure that suitable respiratory equipment is ordered and made available for the employees. Alternatively simple disposable dust masks if locally and readily available should be provided for them.

6.2.3 All the companies should increase the supply of protective clothing from the present one pair to three or four pairs per year because the current supply wear off fast due to its constant use.

RESEARCH INSTRUMENTS & APPENDICES

APPENDICES I

DETAILED SUMMARY OF FACTORY ACT RULES AND REGULATIONS

1. Maintain general cleanliness of the factory by removing any accumulation of dirt and refuse from floors and other surfaces at least weekly.

2. Avoid overcrowding in the factory workrooms by maintaining 12 mm^3 of space for every individual and a height of not less than 3M.

3. Provide adequate ventilation of workrooms by ensuring circulation of fresh air to protect workers from inhalation of dust fumes or other impurities that may be injurious to them.

4. Provide local exhaust ventilation where practicable.

5. Provide protective clothing that is suitable for all workers involved in excessive exposure to the offensive substance.

6. Educate the workers on the importance of continued proper use of protective clothing.

7. Provide adequate and suitable accommodation for change rooms.

8. Display the Abstract of the Factory Act within the premises for the workers to read.

9. Provision for medical examination wherever indicated for occupational reasons.

APPENDICES II

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QUESTIONNAIRE FOR MANAGEMENT REPRESENTATIVE ON FACTORS CONTRIBUTING TO NON-COMPLIANCE WITH RESPIRATORY CONTROL MEASURES AMONG MILLERS IN LUSAKA URBAN

INSTRUCTIONS

1. Your participation in answering this Questionnaire will be highly appreciated.
2. Do not write your name on the Questionnaire.
3. Answer all questions by ticking (√) in the box provided or by filling the spaces provided.
4. All answers will be treated in strict confidence.

SECTION 1: DEMOGRAPHIC DATA

OFFICIAL USE

Q1. What is the name of your company?

a) Robin Hood products ☐

b) Ghiardi Milling Company ☐ ☐

c) National Milling Cairo Road ☐

Q2. Age

a) 25 - 30 ☐

b) 31 - 35 ☐

c) 36 - 40 ☐ ☐

d) 41 and above ☐

Q3. Sex

a) Female ☐ ☐

b) Male ☐

Q4. Marital Status

a) Single ☐ ☐

b) Married ☐

c) Others (specify).....

OFFICIAL USE

Q5. Educational level

a) Primary ☐

b) Secondary ☐ ☐

c) College ☐

d) University ☐

e) Others (specify).....

Q6. What is your job title?

a) General Manager ☐

b) Mills Manager ☐ ☐

c) Production Manager ☐

d) Safety Manager ☐

e) Others (specify).....

Q7. How long has your company been in existence?

a) Less than 5 years ☐

b) 6-10 years ☐ ☐

c) 11 years and above ☐

Q8. How long have you worked for the company?

a) Less than 5 years ☐

b) 6-10 years ☐ ☐

c) 11 years and above ☐

Q9. How many workers do you have?

a) Less than 50 ☐

b) 51 - 100 ☐ ☐

c) 151 and above ☐

SECTION 2: EMPLOYER FACTORS

Q10. How does your company deal with occupational safety?

a) Conduct periodic medical examination and screening for employees. ☐ ☐

b) Provision of safety program for employees. ☐ ☐

c) Instruction and training of employees in methods of work which will minimise risk of ill-health. ☐ ☐

d) Supervision to ensure instructions are always followed. ☐ ☐

e) Others (specify).....

Q11. What major problems do you experience in dealing with occupational safety?

a) Inadequate funds to conduct training and periodic medical examinations. ☐ ☐

b) Inadequate trained human resources to conduct training. ☐ ☐

c) Others (specify).....

Q12. What major respiratory health hazards have you observed from your industry?

a) Overcrowding in the workrooms. ☐ ☐

b) Excess dust within the factory. ☐ ☐

c) Inadequate ventilation system. ☐ ☐

d) Inadequate waste disposal. ☐ ☐

e) others (specify).....

Q13. How have you been able to deal with each one of them?

a) Minimise congestion in the workrooms. ☐ ☐

b) Ensure general cleanliness of the premises. ☐ ☐

c) Ensure adequate ventilation system. ☐ ☐

d) Provision for adequate waste disposal. ☐ ☐

e) Others (specify).....

Q14. In your opinion what are your recommendations for suggested improvement?

a) Monitoring the environment by measurement of airborne contaminants. ☐ ☐

b) Train own industrial hygienist. ☐ ☐

c) Establishment of employee safety committees. ☐ ☐

d) Others (specify).....

OFFICIAL USE

SECTION 3: PROVISION FOR EMPLOYEES

Q15. Does your company have a Clinic or first aid room?

a) Yes ☐ ☐

b) No ☐

Q16. Give reasons for your answer.

.....
.....
.....

Q17. What are the recommended operation hours per shift for the employees?

a) 08 hours ☐ ☐

b) 12 hours ☐ ☐

c) Others (specify).....

Q18. Give reasons for your answer.

a) To minimise exposure time to the environmental hazards. ☐ ☐

b) Others (specify).....

Q19. What protective equipment are employees provided with?

(a) protective clothing ☐ ☐

b) masks ☐ ☐

c) dust respirators ☐ ☐

d) Others (specify).....

Q20. How often are employees provided with protective clothing?

a) Two times a year ☐ ☐

b) Once a year ☐ ☐

c) others (specify).....

SECTION 4: EMPLOYEE COMPLIANCE

Q21. Do the employees use the protective equipment?

a) Yes ☐ ☐

b) No ☐ ☐

OFFICIAL USE

Q22. Give reasons for your answer.

.....
.....
.....

Q23. How do you ensure that employees comply with the rules and regulations as stipulated by the Factory Act?

a) Provide written policy statement with respect to health and safety at work. ☐ ☐

b) Provision and posting of the Factory Act within the premises. ☐ ☐

c) Conduct induction course for new employees. ☐ ☐

d) Others (specify).....

Q24. Are you visited by factory inspectors?

a) Yes ☐ ☐

b) No ☐

Q25. Indicate how often if answer is Yes.

a) Every 3 months ☐ ☐

b) Every 6 months ☐ ☐

c) Once every year ☐ ☐

d) Others (specify).....

Q26. When was the last inspection conducted?

a) 3 months ago ☐ ☐

b) 6 months ago ☐ ☐

c) 12 months ago ☐ ☐

d) Others (specify).....

Q27. Give reasons if the answer is No to question 24.

.....
.....
.....
.....

THANK YOU VERY MUCH FOR ANSWERING THE QUESTIONNAIRE

A STRUCTURED INTERVIEW SCHEDULE FOR EMPLOYEES ON FACTORS CONTRIBUTING TO NON-COMPLIANCE WITH RESPIRATORY CONTROL MEASURES AMONG MILLERS IN LUSAKA URBAN

INSTRUCTIONS TO THE INTERVIEWER

1. Introduce yourself to the respondent.
2. Ensure confidentiality of the information to be collected.
3. Explain the purpose of the interview.
4. Encourage the respondent to feel free during the discussion.
5. Please ensure that all the questions are answered and indicate the correct answer(s) by either a tick (√) or filling in the space provided.

SECTION I: DEMOGRAPHIC DATA

OFFICIAL USE

1. Sex
   - a) Female ☐
   - b) Male ☐

2. Age
   - a) Below 20 years ☐
   - b) 21 - 30 years ☐
   - c) 31 - 40 years ☐
   - d) 41 years and above ☐

3. Marital Status
   - a) Single ☐
   - b) Married ☐
   - c) Separated ☐
   - d) Divorced ☐
   - e) Widowed

4. Educational level
   - a) Primary ☐
   - b) Secondary ☐
   - c) College ☐
   - d) University ☐
   - e) Others (specify)..... ☐

OFFICIAL USE

5. How long have you worked for the company?

a) Less than 5 years ☐

b) 6-10 years ☐ ☐

c) 11 years and above ☐

SECTION 2: EMPLOYEES ASSESSMENT OF EMPLOYER FACTORS

6. How does your company deal with occupational health and safety?

a) Conduct induction course for new employees. ☐ ☐

b) Conduct periodic medical examinations and screening of employees. ☐ ☐

c) Provide protective equipment/ clothing. ☐ ☐

d) Provision of safety program. ☐ ☐

e) Conduct medical examinations for new employees only.

7. In your opinion what do you think could be the major problems that the company experiences in dealing with occupational health and safety?

a) Inadequate funds to conduct training periodic medical examinations and purchase protective equipment/clothing. ☐ ☐

b) Inadequate trained personnel to conduct training. ☐ ☐

c) Others (specify).....

8. Does your company provide protective equipment and clothing.

a) Yes ☐ ☐

b) No ☐

9. If the answer is Yes, how often is protective equipment/clothing provided?

a) Once a year ☐ ☐

b) Whenever they wear off ☐

c) Provide own clothes ☐

d) Others (specify).....

OFFICIAL USE

10. What protective equipment are you provided with?

    a) Masks ☐ ☐

    b) Dust respirators ☐ ☐

    c) Protective clothing ☐ ☐

    d) Others (specify).....

11. Does your company have a Clinic? ☐ ☐

    a) Yes

    b) No ☐

12. Give reasons if your answer to question 11 is No.

    .....
    .....

13. What is your working time table like?

    a) Work 8 hours per day ☐

    b) Work 12 hours per day ☐ ☐

    c) Work more than 12 hours per day ☐

    d) Others (specify).....

SECTION 3: EMPLOYEE ATTITUDE AND PRACTICES

14. Do you use protective equipment/clothing when on duty?

    a) Yes ☐ ☐

    b) No ☐

15. Give reasons for your answer to question 14.
    .....
    .....

16. If the answer is Yes to question 14, do you use them always?

    a) All the time when on duty ☐ ☐

    b) Sometimes ☐

    c) Others (specify).....

17. Are the protective equipment/clothing suitable for your type of work?

    a) Yes ☐ ☐

    b) No ☐

OFFICIAL USE

18. Give reasons for your answer.

.....
.....

19. What in your opinion would be the best suggestions for improvement concerning the provision of protective equipment/ clothing and general safety?

a) Provide adequate protective equipment/clothing. ☐ ☐

b) Others (specify).....

END OF INTERVIEW, THANK YOU.

A FACTORY ACTIVITY OBSERVATION SCHEME ON FACTORS CONTRIBUTING TO NON-COMPLIANCE WITH RESPIRATORY CONTROL MEASURES AMONG MILLERS IN LUSAKA URBAN.

TIME STARTED:..... NAME OF COMPANY:.....

TIME ENDED:.....

DISPLAY OF ACT	GENERAL CLEANLINESS OF PREMISES	VENTILATION SYSTEM	USE OF PROTECTIVE CLOTHING	IDENTIFIED RESPIRATORY HAZARDS	GENERAL COMMENTS
Yes ... No ...	Clean .... Dirt	Adequate if Working Well .... Inadequate if Not Working Well	Overall... Caps .... Masks .... Others....	1. Dirty Premises Yes .... No .... 2. Poor Ventila-tion System Yes .... No .... 3. Over-crowding in Work Rooms Yes .... No .... 4. No Wash or Change Rooms Yes .... No .... 5. Poor Waste Disposal Yes .... No	

OBSERVED BY:.....

National Milling Company Limited

Telephone: 241076/241331/241143/241266
P.O. Box 30025 LUSAKA
Telex: ZA 43721
Fax: 247428

Telegrams: ATLAS
ZAMBIA.

Please reply to:

NMC/PD/2.9

17th June 1994

Laura M Mafuta
University of Zambia
School of Medicine
P O Box 50110
LUSAKA

Dear Sir

RE: RESEARCH STUDY

Reference is made to your letter of 30th May addressed to the General Manager concerning the above subject.

We wish to inform you that we have no objection. You can call at our Cairo Raod Branch offices in room 11 and see the undersigned.

Yours faithfully
NATIONAL MILLING COMPANY LIMITED

M S D SIMBWALANGA
MANAGER HUMAN RESOURCES

SCHOOL OF MEDICINE
UNIVERSITY OF ZAMBIA

P.O.BOX 50110, LUSAKA, ZAMBIA

Telephones:
252641 (Dean's Office)
211440 (University Teaching Hospital)
216767 (Pre-Clinical)
Telegrams: Unza. Lusaka.

DEPARTMENT OF POST BASIC NURSING

30th May, 1994.

The General Manager,
Robinhood Products,
LUSAKA

U.F.S. The Head,
Department of Post Basic Nursing,
LUSAKA.

Dear Sir,

Re: **RESEARCH STUDY**

I am a final year student at the School of Medicine, Post Basic Nursing Department, University of Zambia. I am required to submit a research study in the area of my interest as part of the course requirements.

My research topic is: A study of factors contributing to non-compliance with respiratory control measures among millers in Lusaka Urban.

I would be very grateful if you could kindly grant me permission to administer questionnaires and conduct interviews in your company. This will enable me to collect data required for the study. Collection of data will be conducted between 6th June and 20th June, 1994.

Your favourable response will be greatly appreciated.

Yours faithfully,

Laura M. Mafuta
STUDENT

Robinhood Products
P.O. Box 354
Lusaka

06/06/94

SCHOOL OF MEDICINE
UNIVERSITY OF ZAMBIA

P.O.BOX 50110, LUSAKA, ZAMBIA

Telephones:
252641 (Dean's Office)
211440 (University Teaching Hospital)
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Telegrams: Unza. Lusaka.

DEPARTMENT OF POST BASIC NURSING

30th May, 1994.

The General Manager,
Ghirardi Milling Company Ltd.,
P/B W55
LUSAKA.

U.F.S. The Head,
Department of Post Basic Nursing,
LUSAKA.

Dear Sir,

Re: **RESEARCH STUDY**

I am a final year student at the School of Medicine, Post Basic Nursing Department, University of Zambia. I am required to submit a research study in the area of my interest as part of the course requirements.

My research topic is: A study of factors contributing to non-compliance with respiratory control measures among millers in Lusaka Urban.

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Your favourable response will be greatly appreciated.

Yours faithfully,

Laura M. Mafuta
STUDENT

GHIRARDI MILLING CO. LTD.
P/BAG W. 55
LUSAKA

MWENTA Wicknes
7/6/94
Visited plant at ... and went ... mills.