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The effect of lifestyle on employee absentee rates

Coppens, Jennifer Marie.

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thirty days of sick days from the workplace over a three year cycle pro rata for the first year of employment.

The second category is absent without permission. An employee stays away from work without an acceptable reason or without making prior arrangements.

Many employees, if absent without permission, often return to work and complete an annual leave form. Since the absence from work is unscheduled, this falls into the category of absenteeism.

2. Reduced productivity due to the absence of the worker. Production may not be able to be run through a machine if the operator is off work and there are no other skilled operators available to work the machine. The more skilled the employee, the more impact on productivity an employee has if he/she is absent without prior notice. Production time is lost in the re-allocation of staff. Replacement staff are not as productive in the workplace as the scheduled employee. Mistakes are often made and the relief employee usually works a great deal slower. The accident rate

CHAPTER 1 INTRODUCTION

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In the management of labour costs, the cost to the company of employees who are absent is often closely monitored, and when this cost is above 4% of the payroll, or perceived by management to be high, action is normally taken to reduce this cost.

Absenteeism is defined as non-attendance when an employee is scheduled to work. The United States Department of Labour, as quoted in Van der Merwe and Miller (1988, p3) defined absenteeism in 1962 as:

> "the failure of workers to report for work when they are scheduled to do so"

The cost to the company is twofold:

1. Paid time for no return in labour productivity. All employees qualify for a certain number of days sick leave per annum. This depends on the sick leave policy of the company. The minimum sick leave to be paid in South Africa is stipulated in the Basic Conditions of Employment Act (1983) and is

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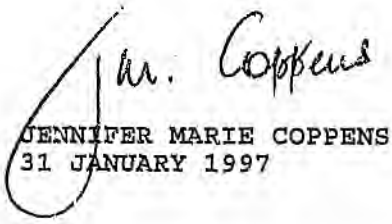
DECLARATION

I declare that this research project report is my own unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Management in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.



JENNIFER MARIE COPPENS
31 JANUARY 1997

ABSTRACT

Research in America shows that the traditional lifestyles (poor diet, lack of exercise, chronic illness, poor stress management and substance abuse) play a large role in causing the major dreaded diseases like cancer, coronary heart disease and strokes, and impact negatively on absenteeism. Traditional lifestyles and absenteeism (absent without permission and sick leave) of 126 employees were measured in a manufacturing plant, and the results correlated by using the Spearman's Rank Order Correlation Co-efficient and co-efficient of determination.

It was established that the traditional lifestyle behaviours do impact on absenteeism i.e. the more severe the lifestyle and the unhealthier lifestyle practised, the higher the individual absenteeism is likely to be. There was no correlation between age and absenteeism and job grade and absenteeism.

Before applying the traditional absentee reducing interventions, an organisation should measure lifestyles of their employees and if unhealthy, lifestyle change interventions should be introduced before or concurrently with traditional absentee reducing interventions if days absent are mainly due to sick leave.

THE EFFECT OF LIFESTYLE ON EMPLOYEE ABSENTEE RATES

JENNIFER MARIE COPPENS

A research report submitted to

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University of the Witwatersrand

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for the degree of

Master of Management

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status, income education, personal attendance history, values and non work activities.

2. Organisational factors include:

- Size of the organisation, size of work group, shift work, ove time, absence control systems, incentive schemes, structure of organisation and type of work.

3. Attitudinal factors:

- Include attitude to the job. In their book 'Measuring Absence and Labour Turnover', Van der Merwe and Miller (1986) conclude that there is a great deal of contradiction in the research on absence from the work place. However, the greatest correlation can be found between job satisfaction and absenteeism. This is supported by Umstot (1984) who states that the degree of self control and employee job satisfaction are the key factors in determining absence from the work place. However, Veigh (1986) and Steers and Rhodes (1994) do not support

that reflect unpredictable individual behaviour are:

1. Paid leave where permission is granted after the fact.

2. Unpaid leave where permission is granted after the fact.

3. Sick leave excluding injury or illness contracted in the workplace.

4. Absent without permission.

Absence and turnover are often linked together. However, turnover is not considered within the scope of this research project, although research does show that absence influences turnover and high turnover can have large financial implications on the company.

Causes of absentee behaviour

Van der Merwe and Miller (1986) group the causes of absence from the workplace under three areas:

1. Personal factors:
   - age, sex, length of service, marital

have been followed, the strike is legal, and the company is aware that the employees will be absent. In this case the company has had reasonable time to stop the strike and/or to make plans to protect the business. Although very costly and unpredictable in the long term, legal strikes do not fall into the absentee calculation.

Many companies however do not include any strike activity in the absentee figures. The main reason given here is that the mechanisms that result in such absence are very different from the behaviour that causes the traditional absence. Strike action reflects collective conflict rather than individual reasons for absence, and therefore should not be confused or lumped together with other absence figures. The traditional interventions used to control absenteeism do not apply to illegal strike action.

Absentee figures are generic in description and consist of several categories. Absentee figures do not necessarily mean absence without permission. Care must be taken to read the words in context, in order to understand the literature on absenteeism.

To summarise, absence from the work place, can be recorded in several categories and the categories

reasons which include death or critical illness in the family. Although unpredictable in nature, it is not usually included in the absence figures. This type of leave is infrequent and the reason is usually beyond the control of the employee and employer. Compassionate leave is also very tightly controlled by human resource policy and/or substantive wage agreements. This is also the case of study leave, paternity and maternity leave. Although an accident at work is unpredictable and costly to the company, legislation, systems and insurance (Workmens Compensation Act) are in place to control this type of leave and reduce the cost to the company. This is not usually considered to be part of sick leave.

Strike action is unpredictable. Illegal strike action is often considered by many companies to be absent without permission. The rationale behind this is that all illegal strikes by definition are strikes that take place without the necessary dispute procedures having been followed. The time frame usually does not allow for the company to prepare or prevent the strike. The dispute procedures are those defined in the current Labour Relations Act and/or the Recognition Agreement that is in place. Where the current Labour Relations Act and the Recognition Agreement that is in place

form completed beforehand (in the case of cold surgery) the leave is not predicted. In many companies, especially at wage earner level, sick leave is defined by the submission of a sick note and this, in most cases, is done after the fact. Once the allocated sick leave is taken up, the record still reflects sick leave and this then becomes unpaid sick leave or annual leave, but is still considered as absenteeism because of the unplanned nature of the leave. Other companies may only require a sick note from the second or third day of absence from the workplace due to illness. However, a leave form indicating the reason for the absence (sick, compassionate, annual, etc) is always submitted where sick leave is taken. The correct recording of absence is required by the Basic Conditions of Employment Act (1983). Absence without permission is normally leave taken from the workplace without a duly completed leave form. In this case, the employee is off work without permission or with a valid reason which he has discussed with his supervisor. This type of leave does not require a leave form. The fact that there is no leave form usually defines the leave as absent without permission.

Another leave type that is taken is compassionate leave. This leave is granted for compassionate

CHAPTER 2 LITERATURE REVIEW

1. ABSENTEE FIGURES IN AN ORGANISATION

Definition and categorisation of absentee behaviour

In the South African literature, the definition of absenteeism given on p10 is the definition that is commonly used, i.e. the definition quoted earlier by the United States Department of Labour. The criterion is unplanned absence from work. For paid and unpaid leave this is defined in practical terms, as all leave that is taken, where the leave form is authorised after the date indicating the actual absence from work (Van der Merwe and Miller, 1986). The assumption made here is that if the leave is planned the leave form would be completed before the leave is actually taken, and therefore management can prepare for the absence and reduce the cost of the absence. The costliest absenteeism is unscheduled absence that is paid for. This is unscheduled absence that is subtracted from the annual leave allocation or the sick leave allocation. Unscheduled absence that is taken as unpaid leave is understandably not as expensive.

Sick leave by its nature is unpredictable. Even though this sick leave may be planned and the leave

2. Lifestyle profile.

3. Correlations.

In Chapter 5, the findings will be evaluated. These will be related back to the literature review in order to establish whether this research is consistent with current research findings.

In the final chapter, Chapter 6, a conclusion will be drawn from the findings in this research project. This will cover the depth to which the research objective has been met, what the implications of this research are, and the recommendations for management. Areas for further research that become apparent from the conclusion will end off the research project.

absenteeism.

5. The relationship between age and absenteeism and grade and absenteeism.

This is done in order to establish a solid theoretical base for the research design and thereby make it more meaningful.

Having established the theoretical base for the project, the research approach will be discussed in detail and what has been done to make the design as reliable and as valid as possible. Here problems that are expected to be encountered and how they will be dealt with will be briefly discussed. This chapter will also cover the data collection and analysis of the data.

Chapter 4 will deal with the findings of the research. The data collected will be represented in table form, and summarised into something meaningful by using the applicable correlation statistic. The following will make up the findings of the research project:

1. Respondents compared to population, grade and age.

introduced for the reduction of absenteeism, and the traditional absentee reducing interventions should be concentrated upon. This research project therefore tries to answer the question:

> 'Should lifestyle changing interventions be introduced in order to reduce absenteeism in an organisation?'

4. OUTLINE OF THE REPORT

Chapter 2 of this report will first examine the current research on:

1. Absentee figures in an organisation.

   1.1 Definition and categorisation of absentee behaviour,

   1.2 Causes of absentee behaviour.

2. Definition of lifestyle behaviours.

3. The relationship between lifestyle and illness.

4. The relationship between lifestyle and

days not worked. This excludes acting allowances paid to relief staff and the cost of productivity lost due to worker absence.

However, since lifestyle behaviour impacts on illness and illness impacts on absence from work, through sick leave, change in lifestyles may reduce absenteeism.

This research looks at lifestyle changes as one of the interventions to be introduced in reducing absenteeism.

3. RESEARCH OBJECTIVE

The research objective is to establish whether there is a correlation between unhealthy lifestyle behaviour and absenteeism. Such information becomes necessary in a work situation where the absentee rate is high or above 4% and management wishes to reduce the absentee costs. If there is a high correlation between unhealthy behaviour and absenteeism, the lifestyle changing intervention should be introduced simultaneously or before the traditional absentee reducing interventions, in order to have effective, efficient and long term absentee reduction. If there is no correlation, then lifestyle changing interventions should not be

Illness has been closely associated in the western world to lifestyle practices. Hicks (1990) proposes that major illnesses like coronary heart disease (heart attack), cerebral vascular accidents (strokes) and cancer, including some chronic conditions like diabetes and high blood pressure, can be prevented, even though there is a genetic component, by practising a healthy lifestyle, i.e. healthy diet, exercise, good stress management and being free from substance abuse. This is supported by the Heart Foundation of South Africa and the Cancer Association of South Africa. It therefore follows that there should be a relationship between absence, especially sick leave, and employee lifestyle. If this relationship is direct, then changing employee lifestyles may be a way to reduce absence and the costs associated with it. This research project investigates this relationship.

Absenteeism is costly and there is a great deal of research that deals with ways to control/reduce absenteeism in the workplace.

In 1996, at a packaging manufacturing plant in Gauteng, sick leave cost R193 434,64 in paid

may also rise when relief staff are used.

Absence from the workplace is costly, and, if significant, can impact on the bottom line.

There is a great deal of research investigating the general causes of absenteeism, details of which will be discussed in the literature review. According to Van Der Merwe and Miller (1986), the best way to control absenteeism is to set group norms that are acceptable to both worker and management.

However, looking at the problem of absence from the employee's health point of view, research in the United States indicates that lifestyle has an impact on absenteeism. Substance abusers have absenteeism rates sixteen times greater than normal groups (Masi, 1994).

It follows that if employees are ill more often, they will be absent from work more often. If employees are well, there will be a lower absentee rate (especially sick leave) in the organisation, than in companies which have a high ill-health profile.

only to tobacco. 35% of all cancer deaths are attributable to dietary risk factors. This body summarises the above data by stating that improving the diet of the average American could extend the productive lifespan and reduce the occurrence of chronic diseases including cardiovascular disease, cancer and diabetes mellitus.

The above research is supported by the various medical research institutes in South Africa, collated and communicated by the South African Heart Foundation, the South African Cancer Association and the Diabetic Society of South Africa. In one of their brochures, put out by the South African Heart Foundation, it states that for every cigarette smoked by an individual he/she shortens his/her lifespan by 5,5 minutes! Most medical textbooks describe the physiology or the process that links poor lifestyle to serious vascular diseases and cancer. For example, smoking results in the inhalation of nicotine. Nicotine has a vasoconstrictive effect on all vessels in the body through the autonomic nervous system. This results in a marked increase in hypertension, as the heart has to pump much harder to get the blood carrying the oxygen through a constricted vessel to the cells. This increase in pressure can cause the capillaries in the brain to rupture therefore

In 1993, as published by the Centre of Disease Control, the leading causes of death in the United States of America were:

- Heart disease (about 35%),
- Cancer (about 25%),
- Stroke (about 7,5%),
- Bronchitis and emphysema (4%),
- Injuries, pneumonia, diabetes, AIDS, suicide, homicide (being less than 4% each).

From the data quoted by the Centre for Disease Control, it can be seen that the major killers of the American population are heart disease and cancer, and that this is largely due to the use of tobacco, poor diet and lack of exercise. Actual research quoted by the above body states that sedentary persons have twice the risk of coronary heart disease as do physically active persons. Physical activity prevents coronary heart disease and appears to provide protection against adult onset diabetes, hypertension, certain cancers, osteoporosis and depression. The above body further states that 30-40% of coronary heart deaths are attributed to obesity and high blood cholesterol. Poor diet and low physical activity is associated to 300,000 deaths each year, second

Stated of America today. They are:

- Coronary Heart Disease,
- Cerebrovascular Disease,
- Lung Cancer,
- Chronic Obstructive Airway Disease (COAD),
- Colorectal Cancer,
- Breast Cancer,
- Diabetes,
- Cirrhosis of the Liver,
- Cervical Cancer,
- Chronic Musculoskeletal Disease (including lower back pain, arthritis and osteoporosis).

In 1990 the actual causes of death, as quoted by the Centre of Disease Control, in the United States were as follows:

- Tobacco (just under 20%),
- Poor diet / lack of exercise (just under 15%),
- Alcohol abuse (4,5%),
- Infectious agents, pollutants, firearms, sexual behaviour, motor vehicle accidents and illicit drug use (all under 4% each).

but if combined with unhealthy lifestyle behaviour, the risk of serious vascular disease is of course so much greater. The presence of arteriosclerosis and/or high blood pressure appear to be the first warning signs that the individual is now a high risk for the development of coronary heart disease or cerebral vascular disease. Research has shown that a change to healthy lifestyle behaviours i.e. a low fat diet, regular exercise, no substance abuse, especially nicotine, and good stress management will reduce the risk of serious vascular disease developing, and may even reduce the arteriosclerosis process and reduce the blood pressure to within normal limits.

- Cancer:

The above is well documented and supported by the Centre for Disease Control in the United States of America (the equivalent body in South Africa is the Department of Health).

The Centre of Disease Control (CDC) in the USA states that the priority of the centre is to reduce the incidence of the ten most serious chronic diseases prevalent in the United

disease, arrhythmias, the diagram in Appendix 1 has been developed by the writer to summarise the relationship between poor lifestyle behaviours and serious vascular diseases. This diagram has been assessed by an Occupational Medical Officer, Dr E Gray, and a cardiac specialist, Prof Sereli, and found to be an accurate summary of current research. The diagram shows how poor lifestyle impacts on serious vascular illness. Poor lifestyle behaviours impact on arterio-sclerosis and high blood pressure, thereby setting up a vicious cycle, each impacting negatively on each other. The unhealthy lifestyle behaviour can impact directly on this vicious cycle or can do so through the development of obesity and diabetes. Research shows that diabetes and obesity compound the negative effects of high blood pressure and arterio-sclerosis. Arteriosclerosis and high blood pressure usually result in coronary disease or cerebral vascular accidents directly or through the development of cardiac arrhythmias and cardiamegaly (heart enlargement). It must be noted that not all cardiac arrhythmias are caused in the manner described above. Any genetic or congenital heart abnormality can have the same effect,

Western world, i.e. coronary and other heart diseases, cancer, strokes and emphysema (lung pathology where the lung no longer is able to transfer oxygen through membranes to the red blood corpuscles in the blood by a process of osmosis). These diseases are known as the dreaded diseases as they are life threatening and very debilitating. Since they are severe they will result in absence from the workplace and therefore impact on absenteeism. The significance to the South African population will be discussed later.

Hicks (1990) proposes that major illnesses, as described above, can be prevented even though there is a genetic component, through healthy lifestyle behaviours i.e. healthy diet, exercise, good stress management and no substance abuse. This is well supported by research as will be shown below:

- Vascular disease:

  This includes the following diseases:

  * Coronary heart disease (heart attacks, myocardial infarction);
  * Cerebral vascular accidents (strokes);
  * Arrhythmias.

  Combining the research done in the causes of cerebral vascular accidents, coronary heart

- Impulse control,
- Understanding and dealing with other people's feelings (Murray & Huelskotter, 1987),

* social and interpersonal skills,

* stress management,

All these aspects of mental wellness are interrelated. Recent research seems to suggest that these psychiatric/psychological mental behaviours do impact on an individual's physical wellbeing (Murray & Huelskotter 1987).

The mental wellness category of lifestyle behaviours in general is very difficult to define and measure in a research project of this nature, and therefore beyond the scope of this research project. This research project will focus on the traditional lifestyle behaviours i.e. diet, substance abuse (alcohol, dagga tobacco and snuff), exercise and stress management.

3. THE RELATIONSHIP BETWEEN LIFESTYLE AND ILLNESS

Illness in terms of this research project are the diseases that are the major cause of illness in the

- diet
- exercise
- emotional wellness
  * compulsive addictive behaviours

    These behaviours include addiction to substances or behaviours and the resultant abuse thereof. Abuse of a substance or behaviour in this context is the misuse of the substance or behaviour resulting in physical or mental harm and the degree to which the misuse is not controllable. This includes cigarette smoking, dagga, other drug abuse and alcohol abuse. Medical conditions like compulsive eating, bulimia, anorexia nervosa and compulsively working long hours fall into this category.

  * emotional intelligence

    This is currently the 'in' topic amongst occupational social workers. Very briefly and in layman's terms, this can be summarised as emotional maturity. Emotional intelligence deals with:

    - Self awareness,
    - Self motivation,
    - Mood management,

context as to how they impact on an individual's health. Therefore, they tend to be defined in the context of causes of specific health problems, i.e. smoking causes lung cancer, diet impacts on obesity which results in diabetes, high blood pressure and high cholesterolaemia, which in turn causes heart pathology. The traditional lifestyle behaviours therefore are those that have been identified to impact on the serious dreaded illnesses i.e. heart and lung pathology and cancer. They are:

- diet
- exercise
- stress management
- substance abuse (in American literature this concentrates mainly on cigarette smoking and alcohol)

The above tend to be lifestyles most medical practitioners talk about.

More recently, these behaviours are classified more holistically as research has shown how mental wellness impacts on physical illness (Murray & Huelskotter, 1987).

The definition of lifestyle behaviours now tends to encompass the following categories:

Nurse, are usually monitored in the following manner:

a. Signs symptoms and treatment reported by the employee compared to the diagnosis of the sick note.

b. Diagnosis and treatment correlates with the normal time booked off, ie. vomiting and diarrhoea normally results in two days off work unless the patient is hospitalised, a sprained ankle one to three days off. False sick notes are usually picked up in this manner, when the diagnosis does not correlate with the number of days off.

c. Pattern of sick leave (day before or after a day off).

Sick notes therefore, in a well managed occupational health environment, tend to accurately reflect illness.

2. DEFINITION OF LIFESTYLE BEHAVIOURS

Lifestyle behaviours, as the name implies, includes all lifestyle behaviours. These lifestyle behaviours are generally categorised in this

abuse as just mentioned can be picked up and dealt with, thereby keeping the sick notes as a valid determinant of sick leave.

It can also be argued that an employee who resorts to pressurising the doctor into issuing a sick note without an apparent 'acceptable' illness is in fact mentally unhealthy. This behaviour will be interpreted by a clinical psychologist and/or psychiatrist as mentally unhealthy behaviour or practice, usually an avoidance behaviour, in a reaction to stress (Murray & Huelskotter, 1987).

The conclusion that can be drawn from the traditional research on the causes of absence in the workplace is that there is no conclusive evidence indicating the major causes of absenteeism in the work place. The individual, company and environment all play a role. Behrend (1959) states that in times of high unemployment, absence from the work place drops. Where absence from the workplace is high, due to excessive of sick leave, the cause is likely to be due to the high illness profile of the employees and therefore implementation of a preventive health care intervention should seriously be considered.

Sick notes, investigated by the Occupational Health

this finding.

Leigh (1986) states that there will always be an absentee rate of between 3 and 4 percent and that it is very difficult to reduce this further, no matter what interventions are used.

Research from the preventive health care camp states that preventive health care interventions reduce absence rates especially sick leave and therefore have a positive impact on the financial aspect of the business (Masi, 1994 and Hicks, 1990). It follows that if employees are physically and mentally healthy they will not report sick because they will probably not get sick. If preventive health care interventions are implemented in a company with a high sick employee profile, then the expectation would be that absence from the work place would be reduced, as a result of this intervention.

There is also some discussion in the literature as to whether sick notes are a valid measure of illness as some doctors issue sick notes on request rather than illness. The counter argument includes the following:

- If the sick notes are monitored carefully,

Occupational Health Nurse is competent to complete the questionnaire on behalf of the employees as it is part of the annual medical. The health education aspect of her job depends on this information. She is motivated to complete the questionnaire as accurately as possible as it will make her own job easier. The Occupational Health Nurse at this specific plant is competent in the interviewing role and is accepted and respected by the employees. Therefore, the employee is comfortable in giving more honest answers. The Occupational Health Nurse is conversant in many black languages. Since she is Zulu speaking, she understands the 'black culture' and therefore will interpret answers in a more meaningful and accurate way. She will also be able to ask questions in such a manner as to get accurate data and therefore reduce the limitations of the questionnaire. This will ensure validity of the questionnaire i.e. it measures what it was designed to measure.

3. The person collecting and analysing the data is on site and therefore can collect absentee and sick leave data herself and manage or facilitate the questionnaire process directly. The data on absentee and sick leave are valid

The wage earner population extends in skill from the cleaner to production superintendent. By definition, it includes all hourly paid employees. There is data for the last three years on absenteeism and sick leave for those employees who have more than three years service. All employees who have been employed before or from 1 January 1994 to 31 December 1996 have been included in the research data. The more employees included, the more reliable the correlation is going to be. Employees who left during this period, or who joined during this period have not been included. This is to ensure that the absentee and sick leave figures cover the same period for all employees to ensure further consistency and reliability. Absentee figures and lifestyle behaviours have been collected on the same employees.

This population was chosen because:

1. Absentee and sick leave data were readily available,

2. The facilities were in place to complete the questionnaire in a consistent and reliable manner.

   Although discussed again later, the

CHAPTER 3 RESEARCH DESIGN

In this research project, lifestyle behaviour and the absentee rates of wage earners at a manufacturing plant in Gauteng are measured and correlated in order to establish whether this relationship is greater than that of age or job grade and absenteeism rates.

From the research in the literature review, there is a strong direct relationship between lifestyle behaviour and illness, and between illness and sick absence, which is a category of absenteeism. When one correlates the absentee rates and lifestyle behaviour of respective employees, one would expect there to be a positive relationship.

1. POPULATION

The initial population is all wage earner employees at a paper packaging plant in Alrode Gauteng. Salaried staff have not been included because:

- There are only 40 salaried staff.
- There are no accurate records of sick leave for salaried staff,
- Salaried staff have an extremely low absent without permission rate.

There is no literature on job grade and absenteeism per se other than salaried staff (or white collar workers) and management in higher grades that have a very low absent without permission rate (Van der Merwe and Miller, 1986).

There is no difference on sick leave rates from the norm against this group (Van der Merwe and Miller, 1986).

4. The correlation between lifestyle behaviour and absenteeism,

in order to establish the effect of lifestyle behaviours on absentee rates.

5. THE RELATIONSHIP BETWEEN AGE AND ABSENTEEISM & GRADE AND ABSENTEEISM

All medical aids report that the older a person is the more often he/she will become ill and therefore the higher the medical costs incurred by that person (Michele Meewes, Health Care Consultant from Sonnenberg Edwards (Pty) Limited, and Cathy Kendall from NMA Medical Fund Managers).

Accident rates (all types) are higher amongst younger adults than older adults. According to life insurance statistics (Liberty Life and Southern Life), age and illness and age and death statistics show:

- High accident disability rate amongst under 30 years,

- High illness/disability rate increasing steadily from forty years,

established that it is reducible i.e. above 4%, is to establish sick leave rates and lifestyle behaviours. If sick leave is minimal and lifestyle behaviours are healthy, then the intro-duction of the traditional absentee reduction interventions, through the change management process, can be introduced.

If sick leave is high and lifestyle behaviours are healthy, then sick leave is being abused and the intervention that will have the greatest impact will be the management of the abuse of sick leave.

If sick leave is high and lifestyle behaviours are unhealthy, then the intervention that improves lifestyle behaviours should be introduced first before any other interventions are introduced.

This research project in fact suggests the following steps in a corrugated packaging plant:

1. Measurement of absenteeism and estimation of cost,

2. Measurement of sick leave,

3. Measurement of lifestyle behaviours,

written about absentee reduction. However, the traditional interventions involve company culture change, change in supervisory behaviour and change in management styles. Change, by its nature, is difficult, requires commitment and buy-in from all stakeholders, the correct application of rewards. This can be a lengthy process (Armstrong 1994).

Since workers who are ill do not report for duty, and lifestyle behaviour, as proved above, impacts on illness, it would therefore be sensible to establish:

- Sick leave rates and lifestyle behaviours

of employees, firstly to establish whether illness is a probable cause of absenteeism. If illness is a cause of absenteeism, all the other traditional change interventions will have little impact on reducing absenteeism, and will only result in an increased frustration of management and stress of all parties. This is likely to result in greater absenteeism, plus other negative costly effects.

The model proposed in this research project is as follows:

The first step in reducing absenteeism, once having

- Rural clinics and hospitals do not keep accurate statistics.
- Illnesses such as Tuberculosis, AIDS, Hepatitis B and Malaria cause severe life threatening conditions in the rural areas before poor lifestyles can have an impact.

It can therefore be concluded that since the chronic diseases like hypertension and diabetes are prevalent in urban South Africa, the American literature is applicable to the South African situation for the urban population.

Since most working populations are urban-based, the literature can be applied to the urban worker.

The research project looks at absentee behaviour and lifestyle behaviour in a factory situated in Gauteng, which draws labour from the urban areas of Thokoza, Katlehong, Natalspruit, Vosloorus and Tsakane. From the literature review, one would expect to find a positive correlation between lifestyle behaviour and absentee rates.

Absentee rates above 4% are expensive and can be reduced. It is therefore beneficial to measure absenteeism and introduce interventions to reduce absenteeism if above 4%. A great deal has been

- individual genetic make-up,
- the severity and combination of poor life styles,
- sex (females tend to develop coronary heart disease only after menopause).

Once a chronic illness has manifested itself, it can be reversed by correcting or changing the chronic lifestyle to a healthy lifestyle.

Lifestyles in South Africa have not been measured but chronic illness and severe life threatening disease patterns have. Hypertension and diabetes are very prevalent in the 40+ age group of urban population across all race groups. This information was quoted by the SA Heart Foundation, H Seftel, Professor of Medicine, University of the Witwatersrand, H Seedat, Professor of Medicine, University of Natal. The Diabetic Association of South Africa states that 25% of all Asians will develop diabetes mellitus (early or late onset) and at least 10% of the other race groups. It is difficult to discuss the rural population because:

- The rural populations do not report to clinics and hospitals on a regular basis. There are no clinics or populated hospitals in many rural areas.

remarkably (Hicks 1990). Lifestyle behaviour therefore impacts on absenteeism.

With an employee's health deterioration, it follows that an employee will be off work more often especially due to illness. It has been proved, in Section 2 of this chapter, that unhealthy lifestyle behaviours lead to chronic and severe illness. It follows then that severe illness increases the absence from work due to illness. This is supported by Hicks (1990) and Masi (1994). Research on costs on poor lifestyle usually quote total cost to the organisation, including absenteeism.

This appears to be the case in the USA. How applicable are these research findings in South Africa?

Since it has been established that poor lifestyle impacts negatively on chronic illness and on absenteeism, one would assume that there is a direct relationship between chronic illness and absenteeism. Poor lifestyle will lead to chronic illness which in turn will lead to a dreaded disease if the lifestyle is not changed. The period of time depends on factors like:

in this loss of productivity is absenteeism (sick and absent without permission). One third of hospital beds are occupied by medically insured working people who have alcohol, mental health and emotional problems (Masi 1994). Alcohol and drug abuse (including cigarette smoking) represent the greater financial cost to businesses than all other illnesses combined. Substance abusers have an absenteeism rate 16 times greater than non substance abusers (Masi 1994).

The Centre of Disease Control (CDC) can be quoted as stating 350 000 (20%) of all deaths in America are due to cigarette smoking. CDC also reports that alcohol, directly and indirectly, accounts for 200 000 (10,5%) deaths of the American population per year and diet 145,000. In each instance, before death occurs, there is a long period of illness which is often costly (Hicks 1990).

The research does not state how absenteeism is affected as the poor lifestyles develop or become established, therefore it is not known at what stage of poor lifestyle practice absentee behaviours manifest.

A change to good lifestyles, even when chronic illness is present, can reduce absenteeism

causing cerebral vascular accidents, or deposits in the arteries (as a result of the arteriosclerotic process) to dislodge causing a cerebral vascular accident, or coronary heart disease. The actual chemical and detailed physiological process is well documented for coronary heart disease, arteriosclerosis and vascular accidents. The details of this physiology are in fact beyond the scope of this literature review. Smoking also accelerates the arteriosclerotic process (Guyton, 1993).

The evidence is clear that there is a strong link between poor lifestyle behaviours namely diet, exercise, stress management and chronic substance abuse and serious vascular illness and cancer. The debate now is, although there is a direct relationship between lifestyle and vascular diseases and cancer, how long it takes for these diseases to develop if poor lifestyles are practised and what role genetics play.

4. THE RELATIONSHIP BETWEEN LIFESTYLE AND ABSENTEEISM

It is naive to believe that employees do not bring their problems to work. Masi (1994) states that alcohol, drugs and mental health problems cost companies in the United States about $3000,00 per employee per year in lost productivity. Included

abuse is generally denied, blatant alcohol abuse will already be reflected in the medical record. Where an employee is absent or sick or suspected of being under the influence, is absent on a Friday or Monday, and is an erratic performer, he/she will be referred to the Occupational Health Nurse who is trained to establish the degree of substance abuse through questioning and certain blood and urine tests, in which chronic liver damage and serum alcohol level can be established If an employee has a suspected substance abuse problem, or a productivity problem, he/she is likely to be referred to the Occupational Health Nurse.

Alcohol abuse is not seen at this plant as dismissable. It is seen as a treatable illness and therefore an employee is more likely to answer fairly accurately to indirect questions such as 'What do you like drinking' 'How often a week' 'For how many years' and 'What is the most you have consumed in one day'.

The use of snuff, tobacco chewing and

* Exercise,
* Diet,
* Presence of chronic disease,
* Obesity,
* Stress management.

b. Other lifestyle behaviours that impact on illness are:

* Sexual behaviour,
* Presence of other comr· ·'ve behaviours other than substance abuse,
* Engaging in satisfying/ successful social behaviour.

The traditional lifestyle behaviours were chosen because they are easy to measure and, where the employee is required to respond verbally, he/she is likely to respond honestly, because they tend to be neutral subjects and do not result in negative value judgements being made.

c. Substance/alcohol abuse:

The employee's response will be compared to his medical record. Although alcohol

2.3 RECORDING

The data are recorded on the data collection table against the employee number [see Table 3.1]. Once all data had been collected, the individual data items were numbered and clock number and identity number were removed in order to ensure confidentiality.

3. MEASUREMENT OF LIFESTYLE

Measurement of lifestyle was done through a questionnaire completed through a personal interviewing process. [See Appendix 2 for the questionnaire used].

3.1 Questionnaire (Appendix 2)

As stated earlier, the Occupational Health Nurse will complete the questionnaire during a one-on-one interview. [See Chapter 3, Population].

As described in the literature review, there are several lifestyle behaviours.

a. The traditional lifestyle behaviours are:

the sick leave data more credibility as sick leave may be taken due to actual illness and not just as extra leave.

The absentee records were checked against payroll absentee records and, where they differed, the clock cards were checked again. In the same way, the sick leave record was checked against the payroll. Where there was a difference, the actual sick leave record was checked against the sick notes in the personal file. The sick leave and absent without permission, if done by two different people, are likely to be the same. These data therefore have a high degree of reliability. "Reliability of measuring is the degree of self consistency amongst scores earned by that individual i.e. the degree to which the same score is obtained when measured a number of times" as defined by Ghiselli et al (1981, p3).

Validity is the degree to which the tools used to measure what they set out to measure. In the above case, the method used to measure absenteeism in fact measured absenteeism.

2.2.1 Only 15 days sick days are paid each January to December period. Sick notes submitted exceeding 15 days were counted in the data. (Even though an employee has taken all the sick leave due to him, he will still submit a sick leave form and doctor's note to avoid his absence being treated as absent without permission, as this will result in discipline and loss of his/her attendance bonus. See 2.1.1).

2.2.2 Homeopaths sometimes gave sick notes for more than 1 day. Only 1 day is paid for. However, the employee may be absent for the period stated in the sick note.

The actual period of absence from work was taken into account and not just what was paid for.

Although only fifteen days sick leave is paid for, many employees took more than fifteen days. It can therefore be assumed that the policy of 15 days paid sick leave has little effect on actual sick leave taken. This gives

every day absent, 1 day of the bonus is lost to a maximum of 5 days. Absent with permission is unpaid.

2.1.2 Sick leave is paid and no discipline takes place. Sick leave is paid for up to 15 days per year, as per company policy. To claim sick leave, a doctor's note is required. One day sick leave may be claimed on a registered homeopath's note. No discipline is taken if a sick note is submitted.

For the purposes of this research project, the absentee record will be the sum of days absent without permission and sick leave days.

2.2 Sick leave

Information regarding sick leave was taken off actual sick leave forms completed and submitted through the Occupational Health Department. Sick leave as per the payroll, although easier to obtain, is not accurate, as not all sick notes submitted are paid. Sick notes were not paid for the following reasons:

approved after the fact, has not been included. This type of absence accounted for a total of 10 days absence during 1996 amongst the total working population. The impact of these data on the absentee rate is insignificant and therefore does not warrant the time and effort to establish the actual data.

2.1 Absent without permission

These data were collected through manual records done directly off clock cards in the Human Resources Department, and not taken directly off payroll records. Although time consuming, it is more accurate. The payroll records are easier to access. Overtime worked is paid as normal time for hours not worked due to absent without permission, and therefore the absence without permission is masked, since most workers work a great deal of overtime.

2.1.1

Absent without permission results in disciplinary action and, if it regularly occurs, can result in dismissal. Dismissed employees are not part of the data base. A bonus is paid at the end of the year. For

give reasons for poor lifestyle behaviour and what form of change lifestyle behaviour intervention should take.

The relationship between education, cultural background, union membership, nature of work, social demographics and lifestyle behaviour and absenteeism is beyond the scope of this research project.

The difference in population should not alter the relationship per se, but alter the degree of poor lifestyle behaviour present. The gradient of the graph may vary from population to population, but the relationship would be the same.

2. MEASUREMENT OF ABSENTEEISM

Absenteeism by definition is unpredicted absence from work and, for the purpose of this research, covers two types of absence:

- Absent without permission,
- Sick leave.

The absence that is unpredicted, but results in annual leave or unpaid leave being applied for and

Phola Park, Thokoza, Vosloorus and Tsakane which are largely squatter camps where violence etc. is still very prevalent. The recent Zulu march (Dec 1996) and shootings (Aug 1996) in Alrode, and the resultant casualties at the Natalspruit Hospital bear testimony to this fact.

Housing loans are difficult to get in these areas because of the violence and the culture of non-payment for services. Most of the urban employees live in informal housing with water supply being from a tap in the road, and electricity through illegal cabling, or shared supply to several informal houses. Many of the employees who consider themselves as rural, live in various hostels. These facts were recently established in a housing survey. These living conditions do not support healthy lifestyle behaviours.

The above description of the research population will impact on lifestyle behaviour especially on stress management, chronic illness and substance abuse. The above may

union is controversial and still revolutionary in its approach. This is seen by the distributive approach to annual negotiations on substantive issues resulting in a legal strike of three weeks in June 1996 (when PPWAWU settled on the same wage rate in two meetings in March 1996), and resorting to work stoppages for every manifestation of conflict before entering into consultations to deal with the conflict. MWASA has only been in place since December 1995 and is largely made up of the rural, illiterate workforce who were PPWAWU members.

- The nature of work:
  The operation would be described as labour intensive and low technology. The machines in use are the board unit, flexographic printers (by their nature old technology) and stitching, glueing or waxing machines; all based on technology that is at least 10-15 years old.

- Social demographics:
  The workers are drawn from Natalspruit,

- Union membership : 44% belong to the Printing Paper Wood and Allied Workers Union (PPWAWU) and have done so since 1988. This is a Cosatu based union and, due to the relatively high level of education and skills of the union officials, tends to be less confrontational and follow the problem solving approach. This union is more mature than the other union, probably because it has established its legitimacy in the eyes of its membership. This is so because its membership is urban based, is better educated and less marginalised. The other reason is that Cosatu is affiliated to the ANC which is the dominant party in government. It therefore is more secure. The revolution is over since 1994 and it tends to be post revolutionary it its approach. This is seen on the shop floor by their integrative approach to annual negotiations on substantive issues, and problem solving approach to issues on the shop floor.

55% of the workforce are members of the Media Workers Association of South Africa (MWASA), a NACTU affiliated union. This

as they measure actual absence without permission and sick leave data from the original record. The person collecting and analysing the data is also on hand to deal with any questions or concerns, and to ensure that the questionnaire is completed to give the most accurate data.

Whether this information can be used to predict absenteeism in other populations will be based on how similar this population is to other populations and will depend on the following, as these criteria will impact on lifestyle behaviour:

- Education and cultural background. This population is broken down into two main groups, viz 45% urban (home in the Gauteng area) and 55% rural ('real' home is in KwaZulu Natal, Transkei or Moçambique). The latter group, while at work, live in hostels or temporary homes in the local squatter camps. The population tends to be illiterate to semiliterate. The workforce appears to be stable in that over 50% have more than 10 years service with the company.

b. Substance abuse

- No substance abuse = 0 points.

- Abused one or two substances moderately less than 12 units of alcohol per week, less than 10 cigarettes per day = 1 point.

- More than the above = 2 points.

c. Chronic disease

Weight, hypertension, diabetes, coronary or vascular disease, renal pathology and asthma are the serious chronic diseases as they have the most impact on serious life threatening diseases.

Respondents with the above history were scored 2 points, history of other chronic diseases scored 1 point and no chronic diseases scored 0 points.

(Weight, according to the mental wellness definition of lifestyle behaviours, can fall into substance abuse, compulsive addictive behaviours, chronic disease or diet).

a. Diet

All respondents seemed to have adequate bran, brown bread and cereals, protein and milk in their diet. They all ate 'junk food' on a daily basis. The difference between respondents was in the amount of fresh fruit and vegetables in their diets. Since this is a major determinant of a healthy eating habit it was decided to base the scoring on diet on the following:

- Fresh fruit and vegetables less than 3 times a week = 2 points.

- Fresh fruit and vegetables between three and five times a week = 1 point.

- Fresh fruit and vegetables six to seven times a week = 0 points.

3.3 SCORING

Scoring was based on the following principles:

* The healthier the behaviour in each category, the lower the sore. The unhealthier the behaviour in each category, the higher the score.

* The scoring method for each category ranked the respondents into three categories:
  - Healthy : 0 (lowest)
  - Moderately unhealthy : 1
  - Very unhealthy : 2 (highest)

  Before scoring was finalised, all responses in the category were looked at to establish if there were three clear categories and scoring was then done accordingly.

* Weight is classified as having the same effect that hypertension and diabetes have on serious vascular diseases, and therefore has been placed in this category rather than in a category on its own - see Appendix 1.

c. It is difficult to find a convenient time. Since it is part of the Occupational Health Nurse's job and this is also the perception of the employee, time does not become an issue. Management accept that annual medicals have to be done as part of the Occupational Health and Safety Act (1992) and therefore this time has been budgeted for in the production process.

d. Respondents do not have time to consider replies or look up information. The Occupational Health Nurse has a good background knowledge therefore is unlikely to have the need to look up information. She is also trained in interviewing and questioning skills so will be competent to consider responses in time.

The use of the Occupational Health Nurse as the interviewer on lifestyle behaviour ensures that the data collected is reliable compared to data collection using the questionnaire technique. The interviewer in this case is able to compensate for any shortcoming in the questionnaire.

interviewer to evaluate non verbal responses and question further if there are contradictory verbal responses.

The disadvantages listed do not apply in this situation, viz.

a. Cost : this method is usually expensive as interviewers have to be trained and paid. The Occupational Health Nurse is already employed and it is part of her job to interview the entire workforce as it forms an integral part of the annual medicals and preventive health care process.

b. The interviewer may influence the respondents' answers. The interviewer is trained in accurate lifestyle assessment. It is important to her that accurate information is gathered so that her effectiveness in her job is maximised. When considering the above two points, influence is minimised although cannot be eliminated. She also has a good medical background and therefore a general understanding of the topics.

- She has the background knowledge and the questioning and counselling skills.

- She is respected by the workforce who perceive this line of questioning as part of her normal duties.

- This data collection is one of her key performance areas.

- Most of the employees are illiterate and unable to complete questionnaires.

- Most of the employees, if they could read and write, would not make the effort to complete the questionnaire.

- She is able to verify information with her medical records and eliminate all discrepancies therefore ensuring that responses are more accurate.

- Spontaneous answers are given and therefore more accurate. There is no possibility of collective manipulation of answers.

- Face to face contact allows the

sexual behaviour. Questions on sexual behaviour are very sensitive and may easily result in the questionnaire per se being rejected on a collective basis.

To establish the other lifestyles that impact on emotional wellness require a detailed questionnaire drawn up by psychologists and psychiatrists requiring same to measure and therefore impossible for the occupational Health Nurse to administer.

The questionnaire was drawn up in such a manner that a qualified Occupational Health Nurse could get information on lifestyles that could be reflected accurately in order to rank respondents on healthy/unhealthy lifestyle behaviours, and therefore ensure that the interview questionnaire technique was a valid and reliable instrument.

3.2 COLLECTION OF DATA

The data were collected by the Occupational Health Nurse because:

- She is able to collect this data.

h. Stress

This requires an employee response, but the nurse who is the interviewer is competent to establish if the employee feels his lifestyle to be stressful and if he does anything about it.

It is also a topic that the workers talk about easily, and part of the annual medical examination.

Topics like sexual behaviour cause anxiety due to value judgements and will result in questions being asked like 'Why does the sister want to know?'. In our culture in all racial groups, sex is not easily talked about and regarded as a very private topic. It was felt that getting information on sexual behaviour would cause too many problems and increase resistance to the questionnaire as a whole and the Occupational Health Nurse in particular. Therefore it was regarded to be beyond the scope of this research project. It was felt that accurate information on the traditional lifestyle behaviours was most important and not to risk the collection of this information by introducing questions on

patterns.

f. Chronic illness

This will be taken off the medica record and annual medical. Most employees receive their chronic medication through the Occupational Health Nurse. Many chronic illnesses a e first diagnosed through the company clinic as the employee reports there first if he is not well, or it is picked up through the annual medical or the company medical surveillance i.e. chest x-rays, hearing tests, lung function tests, etc.

Employees will freely report to the Sister on any illness that they may have.

g. Obesity

This is measured by taking the employees' weight in overalls and barefoot. The Occupational Health Nurse has tables to assess if an employee is within, below or above the correct weight.

On reflection, it may have been better to put the above in the questionnaire. However, from the information in the table as it stands, a fairly accurate reflection on exercise can be obtained. This will also be reflected in the annual medical and compared to heart rate. The heart rate is an accurate reflection on fitness. The lower the heart rate, the fitter the person. The Occupational Health Nurse will compare the employees' response against his/her medical record and discuss the discrepancy with the employee (Guyton 1988).

Since exercise is not an emotive subject, the responses are likely to reflect actual levels of exercise.

c. Diet

The table reflects aspects of healthy diet if included in the diet on a weekly basis and therefore give an accurate picture of an employee's diet. Excess will be determined by the weight. Since diet is also not emotive, the responses are likely to reflect actual eating

the real purpose of the questionnaire was to establish dagga abuse in order to constructively dismiss certain employees and not to establish lifestyle behaviour for research purposes. It was done this way to ensure acceptance of the questionnaire and reduce conflict. If it is inaccurately reported, it does not affect other parts of the questionnaire. There is also very little research on the effect of dagga on absenteeism. It is far better to get accurate records on alcohol abuse and nicotine consumption, and inaccurate use of dagga than no information at all.

d. Exercise

The Occupational Health Nurse was counselled to establish:

- Sport related exercise,
- Work related exercise (nature of job),
- Home related exercise (e.g. walking to work),

hand made cigarettes are very common practices amongst urban blacks and replace bought cigarette smoking because it is cheaper and more comfortable to use. Leon Wade, a research psychologist at Johnson and Johnson, advises that if snuff, tobacco chewing and hand made cigarettes are not included, much of the substance abuse data will not be reflected in the data as these are common practices amongst urban blacks which impact on employee health. They are not seen as negative unaccept-able behaviours by respondents and will be easily reported on if asked about.

Workers believe that management regard cannabis use far more unacceptable than alcohol and therefore will not report accurately on, and become very negative when asked. Chronic dagga usage will also be reflected on the medical record as it is easily diagnosed on a medical examination and behaviour observation. The Occupational Health Nurse was counselled to establish its use in an indirect way. To have it on the form may lead to worker suspicion. They may feel

could be ascertained by asking the respondent how many times per week. An illiterate or uneducated wage earner is unlikely to know what a balanced diet is, let alone how much protein he has per serving or how many grams of bran he consumes per week. The questionnaire could have asked for more detail, however, this detail was unlikely to be forthcoming from this group of employees. Even though there was an excellent method in data collection, (a trained Occupational Health Nurse who speaks all the black languages in the plant, including English, who has good interviewing skills, an established data base to correlate her information against, and a detailed knowledge on the topic of the questions), would not have revealed any further information. The questionnaire, simple and open, handled by the interviewer, was the best route to go. It may have limited the information and reduced the information to a three point rating scale, but this information is more valid and reliable than it could otherwise have been.

Lifestyle behaviours that cover the spectrum of mental wellness other than stress, substance abuse and interpersonal relationships (marriage, children, social, etc), mental health and other addictive compulsive behaviours were not covered. It was felt that this was beyond the scope of this research project as the questionnaire to be developed would border on sophisticated psychometric testing and beyond the ethical and practical capabilities of the Occupational Health Nurse to administer, let alone the costs involved in developing such a questionnaire. The questionnaire focused on getting information from respondents that impacted on traditional severe dreaded diseases. Although mental illness does also impact on these diseases, the mental aspects such as alcohol and cigarette smoking and stress management impacts the most and this is what has been measured.

The questionnaire looked at all aspects of diet and asked for information. The questionnaire was not specific on amounts. However, accurate information

4.2.4 The lifestyle questionnaire was designed to be a data summary sheet for a trained experienced interviewer. The Occupational Health Nurse has a thorough background on preventive health care. Preventive health care is based on changing lifestyles to prevent future illness. The five lifestyles were chosen because, in the literature, they affect or impact on the traditional dreaded diseases, viz coronary heart disease, cardiovascular diseases and cancer.

Other lifestyle behaviours that also impact on the other dreaded diseases were not covered because of the sensitive nature of the information, fear of losing one's job if the information leaked to management, not accurate information would not be given, and it may cause general resistance to the questionnaire per se and therefore prevent any information being collected. It must be noted that this plant is very volatile on the industrial relations scene and any issue can be made a major issue in order to express the inherent conflict that is present.

had five days recorded absence. This may in fact be more if overtime is worked. The payroll will replace days absent with normal time, and since the employees work on an average of 15 hours of overtime per week, these days absent on the lost clock cards may be masked. Looking at the data base there were 17 respondents with five days absent in 1994. Clock cards for four months were missing. No disciplinary action for being absent without per-mission was on their personal files. Therefore it is unlikely that there would be more than 10 days absent without permission days not recorded for the group of 17. A total of 543 absent without permission days was recorded over 3 years. 10 days is 1,84% and therefore is negligible. This is even less as a percentage of total days absent. Absent without permission and sick leave data is therefore 99% accurate. Grade, age and absence data can be considered accurate data and valid as the data reflects accurately what is being measured and is reliable. If measured again, this is likely to reflect the same figures.

identification documents, but most respondents have sorted this out with the authorities and have been issued with new identification documents, except for one employee who, on her ID record is 69, and according to her birth certificate is 65. For the purpose of this exercise she is 65 years old. Five employees who are respondents still have old identity documents. In each case, there is proof of their correct age. Age therefore can be taken as 99% accurate.

4.2.3 Absentee data has been taken off actual clock cards and sick note leave forms submitted. This has been checked by two persons. Absent without permission is absence reflected on the clock card, and no leave form submitted. Absence without permission up to a maximum of five days means a loss of one day's annual bonus for each day absent without permission. Since all clock cards were available for 1995 and 1996, the absence without permission during this period is accurate. However, not all clock cards were available for 1994 and there may be some error here in those respondents who

4.2 COLLECTION OF DATA

4.2.1 Individual job grades were taken directly off the human resources data base. Pay is linked to grade. In order to receive the correct pay, the correct grade must be in the data base. Pay rate per grade is a union negotiated substantive issue and therefore rate per grade is publicised. Employees can therefore check their rate of pay against their grade and will complain if their grade is incorrect. Therefore these are correctly entered into the system and are accurate. It must be noted that the highest numerical grade is in fact the lowest actual grade and the correlation calculation has been done to accommodate this.

4.2.2 Age is taken off the human resources data base and checked against the identification number. Where this is different, this has been checked against an identification document. The age as per the identification number is correct unless proved otherwise. There seems to be several mistakes made on the

CHAPTER 4 RESEARCH FINDINGS

4,1 RESPONDENTS

Since the absentee and sick leave data were taken over the last three years, all possible respondents who joined the company during the past three years were taken off the list. This means that there were 126 respondents out of 187 respondents. 55 employees joined the company in the last three years.

126 (67,37%) of the possible respondents were interviewed in respect of the lifestyle questionnaire. The Occupational Health Nurse was unable to complete all 187 because there was unprocedural mass action for two days in early December 1996, and due to an extremely high work load and pressure in getting orders out, it was difficult to get staff released for an hour to complete their annual medical and the questionnaire. Work only resumed again on 13 January 1997 and the cut off date for the question-naire was 20 January 1997. 126 is a reasonable number from which to get meaningful data and trends.

See Appendix 4.2 for the calculation of r and r^2 (Spearman's Rank Order Correlation Co-efficient and co-efficient of determination).

The co-efficient of determination was also calculated to establish the degree to which days absent can be explained by lifestyle, age or grade, depending on the correlation.

The relationships of age, grade and total lifestyle is represented by a histogram in Appendix 5.

The graphs are the average and mean age, grade or total lifestyle per days absent.

Since days absent is ratio data, the mean and average for days absent can be calculated.

Histograms were used as grade, and unhealthy lifestyle behaviours are ordinal levels of data.

The Spearman's Rank Order Correlation Co-efficient is the correct correlation co-efficient to use because one set of data is ordinal level. The ideal correlation co-efficient to use is the simple correlation co-efficient because this correlation loses less information and therefore provides a more reliable result. However, the lifestyle data is not ratio data form but ordinal data and therefore the simple correlation cannot be used.

From data in Appendix 3 the Spearman's Rank Order Correlation Co-efficient was calculated for:

- Total lifestyle score and total days absent,
- Diet and total days absent,
- Substance abuse and total days absent,
- Chronic disease and total days absent,
- Exercise and total days absent,
- Stress and total days absent,
- Age and total days absent,
- Grade and total days absent.

See Appendix 4.1 for the ranking process of each x and y used in the correlation.

degree of strength by which one variable is linearly related to another".

This research project examines the effects of lifestyle behaviour on employee absentee rates. By label of the research project it is the effect of x on y.

$Y = A + BX$

Where Y = absentee rates and X = lifestyle behaviours or job grade or age, depending on the correlation.

Therefore lifestyle behaviours and absentee rates are compared to assess if there is a negative or positive correlation or the degree to which they are directly or indirectly proportional.

The data on absentee rates are on the ratio scale of measurement because between each figure there are equal intervals and there is a meaningful zero point. Lifestyle data are on the ordinal scale of measurement as the lifestyle behaviour is ranked in order of healthy to unhealthy and the degree or distance between each rank is unknown (Neale and Liebert, 1980).

other method used.

The above scoring is based on the theory below:

Stress level is the level as perceived by the respondent (Umstot 1994). A situation is only stressful if perceived to be so. However, if it is healthily handled, the effects of stress are reduced (Umstot 1984).

3.4 Recording

The questionnaires were labelled by employee clock number. The scores were entered on the data table against clock number or identification number. See Appendix 3, Table 3.1.

Once all data were entered, a number was assigned and clock number or identification number was deleted to ensure confidentiality.

3.5 CORRELATION OF LIFESTYLE MEASUREMENT

According to Willemse (1994) p188, "The correlation analysis is used to describe the

d. Exercise

No exercise = 2 points. Social weekend exercise and/or moderate exertion in job = 1 point.
Training on a regular basis two to three times a week or regular exercise to and from work and during work = 0 points.

e. Stress

Low stress 0 points
Moderate stress 1 point
High stress 2 points

Points for work and home life are added together and then divided by two.

A respondent's score was reduced by 1 point for every healthy stress reducing method used on a regular b sis ie. exercise, meditation, actively changing stressful factors and engaging in a hobby.

No points were deducted for every

..4 TABLE 3

SUMMARY OF DATA COLLECTED FROM THE LIFESTYLE QUESTIONNAIRE

QUESTION	HEALTHY BEHAVIOUR		MODERATELY UNHEALTHY BEHAVIOUR		VERY UNHEALTHY BEHAVIOUR		TOTAL No. OF RESPONDENTS
	No. of Respondents	% of Total	No. of Respondents	% of Total	No. of Respondents	% of Total	
1	71	56,35%	39	30,95%	16	12,69%	126
2	54	42,86%	36	28,57%	36	28,57%	126
3	76	60,32%	25	19,84%	25	19,84%	126
4	14	11,11%	23	18,25%	89	70,63%	126
5	33	26,19%	50	39,68%	43	34,13%	126
AVERAGE	50	40%	35	27,78%	42	33,72%	

Question 5 STRESS

	HEALTHY	MODERATELY HEALTHY	VERY UNHEALTHY
SCALE	0	1	2
No. OF RESP.	33	50	43

33 perceived that home and work stress was low.

50 perceived that home and work stress was moderate but did not do anything healthy about it.

43 perceived that home and work stress was high and did not do anything healthy about it.

Those respondents who exercised, meditated, engaged in a hobby and actively changed stressful factors all fell into the low stress perceived group.

Question 4 EXERCISE

	HEALTHY	MODERATELY HEALTHY	VERY UNHEALTHY
SCALE	0	1	2
No. OF RESP.	14	23	89

89 were engaged in no exercise at all.

23 engaged in two or less than two hours per week, usually playing soccer.

14 engaged in a regular exercise program of three or more hours per week. This included running and/or walking more than 10km to work and home again.

Question 3 CHRONIC DISEASE

	HEALTHY	MODERATELY HEALTHY	VERY UNHEALTHY
SCALE	0	1	2
No. OF RESP.	76	25	25

76 had no history of chronic disease.

25 had a history of headaches, chronic diarrhoea and constipation, hormonal problems, ulcers and depression.

25 were on treatment for hypertension, diabetes mellitus, had asthma, coronary or vascular heart disease, renal pathology, or were overweight.

All diabetics (six) also suffered from hypertension.

Question 2 SUBSTANCE ABUSE

	HEALTHY	MODERATELY HEALTHY	VERY UNHEALTHY
SCALE	0	1	2
No. OF RESP.	54	36	36

54 respondents did not smoke cigarettes, drink alcohol, take snuff, chew tobacco or smoke their own cigarettes or abuse any other substances.

36 smoked less than 20 cigarettes per day and/or drank less than five units of alcohol per week. Of these 28 smoked and drank alcohol.

36 smoked more than 20 cigarettes per day and drank more than five units of alcohol per week.

31 smoked cigarettes and drank alcohol.

5 smoked and drank alcohol and smoked at least one 'zol' of dagga per day.
No one chewed tobacco, took snuff or only smoked their own rolled cigarettes.

4.3 LIFESTYLE

Question 1 DIET

	HEALTHY	MODERATELY HEALTHY	VERY UNHEALTHY
SCALE	0	1	2
No. OF RESP.	71	39	16

71 respondents ate fresh vegetables and fruit more than five times a week.

39 respondents ate fresh vegetables and fruit between three and five times a week.

16 respondents ate fresh fruit and vegetables less than twice a week.

All respondents ate adequate protein and starch including complex carbohydrates and fats, although most carbohydrates consumed were refined in the form of mealie meal.

4.4.3 Days absent (3 year cycle)

Total days : respondents minimum 0, maximum 128, median 19,5 days. Unable to measure population as 55 of the remainder of staff have not been in the company for 3 years.

Sick days : respondents minimum 0, maximum 122, median 13 days. Only one respondent had a serious medical event and was booked off work for 17 days. The average period of sick leave is two to three days. Very few are longer than five days. 86% of the diagnosis falls into three groups:

- Respiratory chest infections,
- Gastritis,
- Urinary tract infections,

4.4.2 Age

TABLE 2 Number of respondents per age category and number of population per age category.

RESPONDENTS MINIMUM 22 YEARS MAXIMUM 65 POPULATION MINIMUM 22 YEARS MAXIMUM 65

POPULATION AS A GROUP	NUMBER OF RESPONDENTS	PERCENTAGE OF RESPONDENTS	NUMBER POPULATION	PERCENTAGE OF POPULATION
< THAN 29 YEARS	22	17,4	59	24,5
30 - 39 YEARS	37	29,36	97	40,23
40 - 49 YEARS	35	27,77	46	19,09
50 - 59 YEARS	24	19,0	29	12,0
60 - 65 years	8	6,35	10	4,15
TOTAL	126	100%	241	100%

4.4.1 continued

GRADE	13	12	11	10	9	8	TOTAL
RESPONDENTS	6	1	5	3	4	0	126
% OF TOTAL	4,76	0,79	3,96	2,38	3,17	0	100%
POPULATION	9	5	5	3	5	1	241
% OF TOTAL	3,73	2,07	2,07	1,25	2,07	0,41	100%

4.4.1 Grade : Number of respondents per grade. Number of population per grade. Grade 19 is the lowest grade, Grade 9 is the highest grade (Peromnes grading system).

TABLE 1 Note: There were 126 respondents. There are 241 wage earners employed

GRADE	19	18	17	16	15	14
RESPONDENTS	30	21	18	21	11	6
% OF TOTAL		7	14,28	16,67	8,7	4,76
POPULATION	76	47	24	39	17	10
% OF POP.	31,54	19,5	9,96	16,18	7,05	4,15

the amount of information gained may have an impact on the actual correlation, but this will be discussed later. This data was treated as ordinal level data due to the nature of the questionnaire (the distance between each group 0/1/2 cannot be measured).

4.3 There were 126 respondents out of a possible 187 employees who had been with the company for 3 years (absentee data was taken from 1994, 1995 and 1996). Total number of wage earners was 241.

4.4 The respondents have been compared to the total population with respect to grade, age and days absent.

4.4.1 Grade (note Grade 19 is the lowest grade and Grade 9 is the highest grade on the Peromnes grading system).

See p86/87 for tables.

4.4.2 Age (respondents minimum years 22, maximum 65).

See Page 88 for table.

The information on alcohol and cigarette usage may not reflect accurate usage, as no one gives accurate data on this. Most people underestimate how much they smoke and even more how much they drink. However, by introducing questions like 'how much per week', 'what is smoked, eaten or drunk' and 'what is the maximum amount in one week', gets around these problems. The Occupational Health Nurse is able to place the respondent in one of three categories with reasonable accuracy. More categories may be more difficult.

Chronic diseases, diet and stress management can be accurately assessed by skilled questioning. In a relaxed atmosphere, as they are not sensitive questions, the respondents are likely to talk as interest is shown in them individually.

It can therefore be assumed that reasonably accurate information was gained, and this placed in a three point rating scale made this information more valid and reliable. Although reduced,

In this group of people one would expect a high substance abuse/days absent and poor stress management/days absent correlation when one sees the stressful lifestyles and poor living conditions the respondents live in. As discussed earlier, in Chapter 3, this group of employees is marginalised. Life is very insecure and home comforts like running water, electricity, privacy and safe homes are rare. The information gathered from the housing survey therefore supports these correlations.

Diet, is this case the amount of vegetables and fruit (see Chapter 3), chronic diseases and exercise have the lowest impact on days absent with this group of people. This is interesting as the most common unhealthy behaviour is exercise. Only 11% of the incumbents engaged in regular aerobic exercise. This could be due to the nature of the respondents' work.

Although the respondents do not engage in intensive physical exercise during their normal working day, they are by no means sedentary and this moderate level of activity may in fact be enough not to impact on days absent. The measurement of exercise in this research project is too vague and does not take into account work related exercise. These

taking into account the range. The shape of the graphs are similar and support the correlation of 0,53. The answer to the research question therefore is that lifestyle behaviours do impact on absenteeism.

The next question that arises is what impact do the individual lifestyle behaviours have on absenteeism. From Table 4 the lifestyle behaviours that have the greatest individual impact are substance abuse with a correlation of 0,55 and a co-efficient of determination of 0,30, and stress management with a correlation of 0,48 and a co-efficient of determination of 0,23. This means that 30% of the days absent can be attributed to substance abuse and 23% of days absent can be attributed to poor stress management. Substance abuse is one of the signs and symptoms of poor stress management and these are closely linked in the mental wellness paradigm. Therefore one would expect poor stress management and substance abuse to have a correlation score close together. The scores are only applicable to the population at this manufacturing plant in Gauteng. Each manufacturing plant is likely to have its own unique pattern of lifestyle/days absent correlation as each population is unique in its pattern of unhealthy lifestyles.

and absenteeism is 0,52, a co-efficient of determination of 27%. This means that as lifestyle behaviours become more unhealthy, there is a strong tendency for days absent to increase. 27% of days absent can be attributed to unhealthy lifestyle behaviours. This is what one would expect. As a heavy drinker drinks more, or goes on a binge, the typical pattern is to be unable to report for duty the next day. The more frequently this happens, the more days absent he is likely to be. Heavy drinking patterns of behaviour by nature are progressive over time unless interventions are introduced to stop and change behaviours. Since none of the respondents had developed a dreaded disease and there is a positive correlation of 0,53, unhealthy behaviours impact on absenteeism even before the dreaded diseases manifest. Looking at the graph in Appendix 5, table and graphs 5.3.1 and 5.3.2, the average days absent per lifestyle score and median days absent per lifestyle, the correlation can clearly be seen. The average takes into account the minimum and the maximum days absent per lifestyle score. The median is the middle term in the range. The two histograms indicate a similar fairly strong positive relationship i.e. as the lifestyle behaviour becomes more unhealthy so the days absent will increase. The differences are due to the average

thereby causing damage, and damage in the pancreas results in reduced insulin production which is the basis of diabetes mellitus (Guyton (1973). This is supported by the high correlation between substance abuse and absenteeism where 30% of substance abuse impacts on absenteeism directly (Table 4). See 5.3 of this chapter for a detailed interpretation of the correlations.

The high incidence of respiratory tract infections, urinary tract infections and gastritis may be reported by doctors as a result of reporting a safe diagnosis, i.e. gives a valid reason to book an employee off for a few days with signs and symptoms that are general and well known and cannot be checked up on by the average supervisor and therefore not arouse suspicion. Very few sick notes of the respondents' were for more than five days. However, as discussed in the Literature Review, the sick leave is managed well by the Occupational Health Nurse and therefore the probability of non legitimate sick notes is low to unlikely.

5.3 THE CORRELATION BETWEEN UNHEALTHY LIFESTYLE BEHAVIOUR AND ABSENTEEISM [See Table 4]

The correlation between total lifestyle behaviour

infection (which is normally not classified as a sexually transmitted disease) in men is extremely low (Guyton (1973). Since the second highest reason for sick days is urinary tract infection, the probability is high that these days off are mainly due to sexually transmitted diseases. It must be noted that 125 of the respondents are male. Sexual behaviour was not measured in the lifestyle questionnaire. From the assumed incidence of sexually transmitted diseases it should have been included. If it had been included, it may have increased the correlation between unhealthy lifestyle behaviours and absenteeism substantially. The reasons why it was not included have been discussed in Chapter 3 in detail.

The incidence of gastritis is substantial and is due to unhealthy preparation of food and alcohol abuse (Guyton (1993). When an employee abuses alcohol and if he/she reports to the doctor as not being well, it is usually with the symptoms of gastritis. The high incidence of gastritis may be linked to those who scored very unhealthy on substance abuse. The high number of diabetics at this manufacturing plant has been related to high alcohol abuse by the Occupational Health doctor, Dr Gray. (Alcohol abuse causes great strain on the gastrointestinal tract and metabolic processes

substance abuse, it is impossible to say what percentage is made up of smokers. From the results it is unable to establish how many respondents smoked or drank alcohol. However, 31 respondents smoked cigarettes and drank alcohol and five of these respondents smoked dagga. This supports the theory that dagga is very seldom taken on its own, but present with another substance abuse behaviour.

Tuberculosis, although very high in the homelands, only resulted in ten days absent. The incidence of pulmonary tuberculosis at this manufacturing plant is very low. This is accurate as employees are medically surveyed for tuberculosis on an annual basis.

It is impossible to draw any correlation between smokers and the incidence of respiratory tract infection. From the lifestyle survey most of the substance abuse however was smoking and/or alcohol abuse. None of the respondents chewed tobacco or used snuff. In the Literature Review this was reported to be quite common substance abuse by Leon Wade amongst low income South Africans, but it does not seem to be the case with the respondents.

25% of all sick days taken were due to urinary tract infections. The incidence of a urinary tract

source of labour (i.e. Daveyton) to see if living conditions do have an impact on absentee rates.

Since the instrument used to measure lifestyle behaviour has only been used on this group of employees, the results are specific to these employees and cannot be compared to other lifestyle profiles. Therefore, it is difficult to assess whether these respondents actually have an unhealthy lifestyle profile. Having said that, chronic diseases like hypertension and diabetes mellitus can be compared. Chronic diseases can be easily defined and measured in a standard manner by the occupational health profes ional as accurate records are kept. 20% of respondents manifested a serious chronic disease (diabetes mellitus, hypertension, obesity, etc. see Table 5). This is high when compared to the normal working population as reported by the occupational health professional. Therefore, on this basis, the health profile of the respondents is towards the unhealthy side.

From Table 6, 46% of all sick days were due to respiratory tract infections. Smoking increases the incidence of respiratory tract infections. 56% of all respondents do not smoke (manifest no substance abuse) and of the remaining 44% of

employees has to be fully investigated.

5.2 EMPLOYEE UNHEALTHY LIFESTYLE PROFILE

It is difficult to assess whether this manufacturing plant has a healthy or unhealthy health profile. From the percentage of days absent being sick leave, it appears that this manufacturing plant has a very unhealthy health profile. The number of days absent in this group of respondents is only 2,74% of the total possible days worked over the last three years. This indicates that the problem is not as severe as it first appears to be.

In Chapter 3 the respondent population was described to be marginalised and very stressed in terms of living patterns (violence, squatter camps and low standards of living), and therefore one would expect the days absent to be made up largely of sick leave. The absentee rate or sick leave rate does not appear to be excessive although moving towards the high side when compared to other companies generally (van der Merwe & Miller (1986).

It would be interesting to compare absentee rates of large employers in the Alrode area and other companies who draw labour from a less marginalised

CHAPTER 5 INTERPRETATION OF RESULTS

5.1 ASSESSMENT OF ABSENTEEISM

From the model discussed at the end of the Literature Review [p41], step number one is to assess absentee level in the organisation in order to assess if absentee reducing interventions should be introduced.

From the respondents in the research project, the absentee rate is 3,34%. However, the absentee rate for 1996 for the wage population group is more in the region of 6%. Since it is above 4% it can be reduced to below 4%, see p24 in Section 1 in the Literature Review.

It is interesting to note that the non respondents of wage earners at the manufacturing plant examined. 115 in number (61 with more than 3 years service, 54 with less than 3 years service), have a much higher absentee rate, to bring the overall absentee rate to the region of 6%. In this light, one asks the question if 126 of the employees who had the most days absent had in fact completed the questionnaire, how this would have affected the correlations. Since days absent make up 81,62 of the total days absent, the health profile of

4.7 TABLE 6

TYPES OF ILLNESS

When collecting the data on sick leave, a clear pattern on reasons for sick leave on doctors' certificates was noticed. This is represented in the table below.

	No. OF DAYS	% OF TOTAL DAYS
RTI *1	1118	45,99
UTI *2	602	24,76
GASTRITIS	370	15,22
OTHER *3	341	14,03
TOTAL DAYS	2431	100

*1 RTI Respiratory tract infections, including influenza, sinusitis, tonsillitis, sore throat, pharyngitis, bronchitis, pneumonia and tuberculosis

*2 UTI Urinary tract infections

*3 OTHER Osteo-arthritis, backache, injuries, etc.

4.6 TABLE 5

TOTAL DAYS ABSENT PER YEAR AS A PERCENTAGE OF TOTAL POSSIBLE DAYS WORKED

	1994		1995		1996		TOTAL %	
	No. of DAYS	%	No. of DAYS	%	No. of DAYS	%	No. of DAYS	%
SICK	688	2,32	715	2,41	1028	3,47	2431	2,74
AWOL *	172	0,58	233	0,79	138	0,47	543	0,61
TDS *	29610	2,9	29610	3,2	29610	3,9	88830	3,34

* AWOL ABSENT WITHOUT LEAVE

* TDS TOTAL ACTUAL DAYS WORKED NORMAL TIME

4.5 TABLE 4

SPEARMAN'S RANK ORDER CORRELATION CO-EFFICIENT (r)

AND CO-EFFICIENT OF DETERMINATION (r^2)

	r	r^2
Total lifestyle absenteeism	0,53	0,28
Grade and absenteeism	0,006	0,0001
Total Lifestyle and absenteeism	-0,1	0,1
Diet and absenteeism	0,27	0,073
Substance abuse and absenteeism	0,55	0,30
Chronic diseases and absenteeism	0,20	0,04
Exercise and absenteeism	0,34	0,12
Stress and absenteeism	0,48	0,23

absenteeism is made up of sick leave. Since no major illness or accident has been diagnosed or reported on the sick notes, no employee has yet manifested a dreaded serious disease. Twenty percent of the respondents have chronic illnesses which will lead to a dreaded disease in the future, see Chapter 2, Literature Review. This means that twenty percent of the employees, if they do not change their lifestyles, will become severely ill in the future. Lifestyle change interventions should be introduced and targeted as a matter of urgency to these employees to avoid an increase of absenteeism and related costs in the future. The lifestyle change interventions should concentrate on substance abuse and stress management.

Since 60% of all days off ill are due to urinary tract infections, sexually transmitted diseases are very prevalent and this may be a forerunner of an AIDS epidemic. Sex and AIDS education should be a priority in the next two years.

Poor traditional lifestyles are prevalent at the manufacturing plant where the research project took place. Sick leave makes up the majority of the unscheduled absence from the workplace. The Occupational Health Nurse and the Human Resources Practitioner must intervene by implementing life-

treatment.

The incidents of urinary tract infections, amongst male patients, is very low, other than sexually transmitted diseases. Therefore the high incidence of urinary tract infections amongst the male employees can be attributed to sexually transmitted diseases.

6.2 HOW THE RESEARCH OBJECTIVE WAS MET

The research objective was to establish if there was a relationship between unhealthy lifestyles and absenteeism. Since a direct positive relationship of 0,53 was established using the Spearman's Rank Order Correlation Co-efficient, with a co-efficient of determination of 0,28, the research objective was met. There is a relationship between traditional lifestyles and absenteeism. Twenty eight percent of the days absent can be attributed to poor lifestyle behaviours. The research project establishes where there is a relationship and how strong that relationship is.

6.3 RECOMMENDATION FOR MANAGEMENT

Employee lifestyles do impact on absenteeism before the dreaded diseases manifest. The major part of

more stress than management is aware of and this should be looked into.

The biggest insight to come from this research is that employee health in the short and long term can have an impact on short and long term cost containment. Lifestyle behaviours should be measured on an ongoing basis with the introduction of low cost lifestyle improvement interventions for the employees who have poor lifestyle behaviours. It is interesting to note that the data collection designed to measure days absent and lifestyle behaviour also revealed more information. The sick leave was generally taken in periods of under a week (5 days). There were three major reasons for sick leave, viz:

- Respiratory tract infections,
- Gastritis,
- Urinary tract infections.

Smoking which is very prevalent amongst the respondents increases the incidence of bronchitis nd pneumonia.

Drug and alcohol abuse causes gastritis. After a drinking 'binge', an employee is likely to experience gastritis and consult a doctor for

did not examine mental wellness which covers sexual behaviour and impacts on the progression of AIDS.

From this high incidence of sick notes for urinary tract infections, which in males indicates sexually transmitted diseases, the mental wellness lifestyles should be measured as this may have a greater impact on costs in the future, especially with the AIDS epidemic on our doorstep so to speak.

The results of this research project may in fact be a warning sign well worth noting and acting upon. The results of this research project indicate that sick leave is by far the major cause of absenteeism. Since a set number of sick days are paid each year, management believed that sick absenteeism was contained. Absentee management was concentrated in the area of absent without permission. However, this research project has shown that this is not the case (or management of absent without permission was the greater, but due to the management thereof, is now reduced), and that it is now time to manage the sick leave in order to reduce absenteeism.

The high evidence of poor lifestyle behaviours amongst the supervisors (Grade 12 and above) indicate that this level of management may be under

preventive health care objectives of the company and is now more likely to get management support. Money would be more easily allocated to the preventive health care interventions as well as co-operation from line supervision to release staff for training. Assessment would therefore be a little easier to obtain.

The process of this research project was therefore in itself beneficial.

The research project indicates that employee health not often considered before does have an impact on the bottom line and it is important for the present and future costs of the company to improve or maintain employee health where this is a problem i.e. sick leave above 4%. The attitude that prevails in most South African companies is that empl ee health is the domain and responsibility of the individual and he/she must not bring his/her health problems to work. This project indicates that, although employee health may be the domain and responsibility of the individual, by introducing interventions to improve employee health, i.e. improving lifestyles, present costs may be reduced and future costs can be contained. This opens up an area of cost management that few companies are aware of. Note this research project

CHAPTER 6 CONCLUSION

6.1 HIGHLIGHTS OF RESEARCH

The research project gave the Occupational Health Nurse an opportunity to get a good feel for the current health status of the employees at the manufacturing plant where the lifestyle questionnaire was carried out. She is now able to establish relevant priorities and make a better contribution to the improvement of the employees' health. Often the occupational health professional is left unmanaged by his or her line manager due to the manager's lack of expertise in this field. The health professional is often left implementing her/her generic general function as he/she does not have the information base to prioritise in order to make maximum contribution to employee health, and therefore, add maximum value to the organisation. The health professional felt that this exercise helped her to be perceived in a more positive light and increased her credibility. She feels that staff are more likely to be motivated to change their behaviours when she educates and counsels individual employees in better health care practices.

The insight gained lends more credibility to the

direct positive relationship between traditional lifestyle behaviours and days absent. Since 80% of the days absent are sick leave and the absentee rate of the population is 6%, a further indepth unhealthy lifestyle investigation will reveal information that can lead to a meaningful reduction in absenteeism.

Overtime should not be overlooked, and its effect on days absent and unhealthy lifestyle behaviours should also be considered seriously.

research project, the unhealthy lifestyle behaviours that have the greatest impact on absenteeism are substance abuse and stress management. Therefore, interventions introduced should concentrate on the reduction of substance abuse and enable employees to manage their stress better. There are indications in this data that other unhealthy lifestyles not measured may also have a marked impact on absenteeism that fall into the mental wellness category. At this stage it may be worthwhile to assess all employees on the mental wellness of unhealthy lifestyles to get a holistic picture. Mentally well staff are also far more productive than mentally unhealthy staff and therefore the benefits will be greater to the organisation i.e. increased productivity than just reduced absenteeism.

Since sick leave is the greater cause of absenteeism amongst this group of employees, and absenteeism is above 6% for the population, it is well worthwhile for the Occupational Health Nurse to measure unhealthy lifestyles in the broader sense. The categories under lifestyles should be across a scale of five points and not three in order to give more meaningful correlations.

This study therefore indicates that there is a

for a very long period of time, and have been promoted due to technical skills rather than supervisory skills. This could mean that the stress level is extremely high as they are trying to manage a very marginalised unskilled group of workers, in one of the most demanding departments of the factory as far as quality is concerned. Management is always demanding high quality work, in this department. Customer rejections are usually due to printing errors. Errors made on the board unit are very few and far between. Since the numbers are very small in this department, the evaluation discussed above is circumspect and needs to be looked into in greater depth before any action plans are drawn up or conclusions are made.

5.6 CONCLUSION

There is a meaningful direct positive correlation between traditional unhealthy lifestyle behaviours and absenteeism where 28% of the days absent can be attributed to unhealthy lifestyle behaviours. This means that in an organisation where sick leave is above 4% it is certainly worthwhile to assess unhealthy lifestyle behaviours in order to introduce appropriate interventions to reduce unhealthy lifestyle behaviours in order to reduce absenteeism. From the data presented in this

In the histogram 5.1.1 and 5.1.2 there is no indication of direct or indirect relationship. The difference between mean and median can be seen in these graphs. The greatest difference here is in the grade 9 employees. The mean is seven but the average is twenty seven. This means that there was a very wide range between minimum and maximum. However the middle term was seven. In this case there were very few respondents with a wide range in their scores. The number of respondents in grade reduce drastically from grades 14 to 9, largely due to the actual number in the population in these grades being very low. For grades 11 and 10, the entire population in these grades were five in grade 11 and three in grade 10. For grade 9 the population was five and the number of respondents was four. For four employees to achieve an average score of twenty seven days absent means that the lifestyle behaviours in this group vary a great deal to give an average of 0,27 and a mean of 7. This is the highest supervisory group to be measured. There were four respondents. The two respondents above the median must have had a large number of days absent to bring the average up to 27. It also means that the senior supervisors are off a great deal of the time compared to other grade groups. All these supervisors are white printing artisans, who have been with the company

older groups. Illness and age figures reported by medical aids [see Literature Review]. In this study the 50-59 age group have the lowest days absent per age. Although the 60-69 category has the highest days absent as one may expect, ages 30-39 and 40-49 have far higher days absent that one would expect according to the Literature Review. One would expect days absent taken by the youngest age group to be a great deal lower than it is, in fact it should be the lowest, as the ageing process certainly has not begun let alone impacted on health, but this is not the case. There is now obvious reason why this relationship is as it is and further investigation needs to be done, like individual lifestyle behaviour and age. The particular respondents in this study may have a unique pattern of unhealthy lifestyle behaviours where the healthy lifestyle behaviours tend to be practised by the 50-59 age group!

5.5 CORRELATION BETWEEN GRADE AND ABSENTEEISM

The correlation between grade and absenteeism is 0,1% with a co-efficient determination of 0,0001. This means that grade has no impact on days absent and that as the grade increases, days absent does not necessarily change or changes in a haphazard manner.

unhealthy lifestyle correlations are based on a score range of three, 0, 1 and 2, and therefore may not reflect correlations as accurately as scales of five or more.

Overtime was not measured. Staff at this plant work on an average of more than fifteen hours per week. Overtime may impact negatively on stress management or substance abuse and may in fact have a high correlation with days absent.

Before making any further conclusions in this study, overtime should be measured and correlated with days absent. It is understandable that overtime makes employees tired and tired employees become stressed out. Maybe this has already been covered under stress management.

5.4 THE CORRELATION BETWEEN AGE AND ABSENTEEISM

This correlation is 0,01, with a co-efficient of determination of 0. This means that age has no impact on days absent. On examination of the histograms 5.2.1 and 5.2.2 it can be seen that there is no correlation between age and days absent. One would expect the younger the respondent, the less he/she will be ill and therefore the lower the days absent compared to

3. CHRONIC ILLNESS

Has the employee ever been diagnosed to have the following chronic illness?

	YEAR DIAGNOSED	HOW IS THIS CONDITION MANAGED	HOW WELL MANAGED
Hypertension			
Diabetes mellitus			
Hormonal problems			
Asthma			
Headaches			
Chronic diarrhoea / constipation			
Ulcers: Stomach			
Duodenal			
Leg			
Depression			
Coronary or vascular heart disease			
Renal pathology			
COMMENTS:			SCORE

2. **SUBSTANCE ABUSE**

Complete the box below in respect of incumbent.

SUBSTANCE	WHAT TYPE	HOW MUCH PER WEEK	HOW MANY YEARS	MAXIMUM AMOUNT ON ANY ONE DAY
Alcohol				
Snuff				
Cigarettes				
Chew tobacco				
Hand made cigarettes				
Other				
COMMENTS:				SCORE

LIFESTYLE QUESTIONNAIRE

ID NUMBER _____ Number _____

[For summary of data sheet]

1. DIET

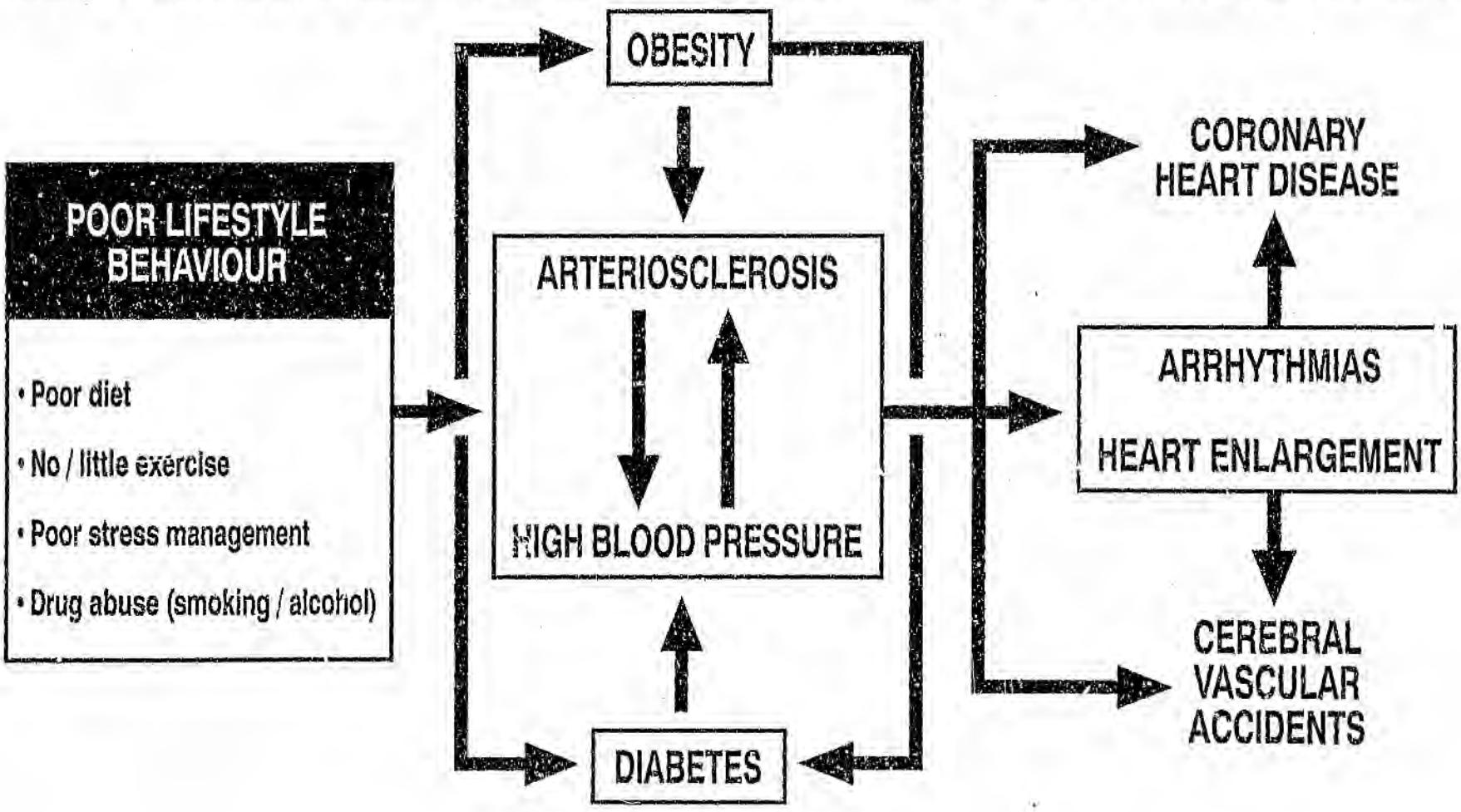
How many times a week does the incumbent eat?

a.	Brown bread, bran enriched foods, cereals	
b.	Fresh fruit	
c.	Fresh vegetables and/or salads	
d.	Fish, meat, chicken, legumes, beans	
e.	Mealie meal, chips, crisps, biscuits, white bread, chocolates and sweets	
f.	Milk products, cheese, sour milk, yoghurt	
COMMENTS:		SCORE

APPENDIX 1

DIAGRAM INDICATING HOW POOR LIFESTYLES IMPACT ON SERIOUS VASCULAR DISEASES

SUMMARY OF LITERATURE ON THE RELATIONSHIP BETWEEN TRADITIONAL LIFESTYLE BEHAVIOURS AND THEIR IMPACT ON TWO DREADED DISEASES



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The data that were collected should be collected at other manufacturing plants in other industries with a different level of technology and drawing their labour from different areas (eg Daveyton) to see if:

- Absenteeism is above 4%.
- The make up of the absentee days (sick or absent without permission).
- The prevalence of unhealthy lifestyle behaviours.
- The correlations established in this research project are the same.

The correlations established in this research project may be because of the marginalised workforce and may not be applicable to other work groups. There may be a greater correlation between the degree of marginalisation and absenteeism than lifestyle and absenteeism. Lifestyle behaviours and degree of marginalisation could be highly correlated.

Overtime should be measured to assess the impact of overtime on days absent of the impact on unhealthy lifestyle behaviours.

sick leave and 0,61% is absent without permission).

Since sick leave makes up 81,62% of the days absent over the last three years, sick leave is high and by far the major cause of days absent. According to the model on p41 lifestyle behaviours should be measured in this organisation in order to assess the unhealthy lifestyle profile of this company. Interventions that improve unhealthy lifestyle behaviours should be considered with the implementation of other absentee reducing interventions.

6.4 AREAS FOR FURTHER RESEARCH

As mentioned above, the area of future research is mental wellness lifestyles in the same plant for the reasons already discussed.

The research project was carried out at a manufacturing plant in Gauteng with the following characteristics:

- Absenteeism is largely made up of sick leave,
- The workforce is marginalised as described in Chapter 3, (low education, low skills, live in mainly squatter camps with poor facilities where violence is still prevalent).

Work related stress can often be reduced by improving supervisory skills and poor lifestyle skills can be improved by intensive life skills training.

Poor lifestyle behaviours are prominent at the manufacturing plant where the data were collected. The company should seriously consider recruiting new staff who have healthy lifestyle behaviours where possible to try and change the culture of poor lifestyle behaviours and reduce sick leave and reduce the implementation of lifestyle changing interventions in the future and thereby help contain company costs. Since the percentage days absent per year appears to be steadily increasing on an annual basis (Table 5 TDS), this trend should be closely monitored for all staff and action taken to reduce it where necessary.

Having established that the manufacturing plant has an absentee rate that is reducible, and one assumes, at 6%, it is impacting to some degree of the bottom line, the next step as per the model proposed on p40 would be to establish how this sick leave is made up.

From the staff who were respondents in the research project, this is made up as per Table 5 (2,71% is

style improvement interventions with the other absentee control interventions if sick leave is to reduce in the long and short term. However, there are indications that other unhealthy lifestyle behaviours are present. The high incidence of substance abuse, chronic illness and poor stress management, plus the high incidence of sexually transmitted diseases all suggest that the greatest problem may be due to the practice of lifestyles not measured in this study. Before embarking on intensive lifestyle changing interventions it may be worthwhile to measure all the lifestyle behaviours that fall in the ball park of mental wellness in order to change the lifestyles that are really impacting on absenteeism now and will impact in the future. In light of the information above, the company should embark upon this holistic approach rather than just focus on the traditional lifestyles.

There is a high incidence of poor lifestyle behaviours amongst the Grade 9 employees. Since Peromnes Grade 9 are supervisors, care must be taken to assess the causes of poor lifestyle behaviours amongst this group due to, amongst other reasons, work related stress or poor life skills. Since supervisors, due to their position, have a great impact on productivity, this is a priority.

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
	X3 GRR		GR	X2 AR	AGE	S	R	94	95	96	T	94	95	96	T	1	2	3	4	5	X1 LSR	LS	Y AR	TA
1	15.5		19	3.5	23 0	M	B	2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0		18	22.0	29 0	M	B	1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	15.5		19	7.0	24 0	M	B	2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0		15	41.0	34 0	M	B	1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5	41.0		18	13.0	26 1	M	B	3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6	41.0		18	101.5	51 0	M	B	2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7	104.5		14	99.0	50 0	M	B	0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5		19	120.0	60 1	M	B	1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5		13	105.0	53 0	M	B	1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5		19	21.0	29 0	M	B	0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0		16	101.5	51 0	M	B	3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
108	15.5		19	30.0	31 0	M	B	0	0	0	0	0	0	3	3	0	0	1	1	1	28.0	3	18.00	3
109	15.5		19	73.0	43 0	M	B	0	0	0	0	0	0	0	0	0	0	1	2	0	28.0	3	5.00	0
110	15.5		19	1.0	21 1	M	B	0	0	0	0	0	0	0	0	1	0	0	1	2	50.5	4	5.00	0
111	117.0		11	101.5	51 0	M	D	0	0	0	0	0	0	0	0	0	2	0	0	1	28.0	3	5.00	0
112	15.5		19	43.5	35 0	M	B	0	0	0	0	0	0	1	1	0	1	0	2	0	28.0	3	11.50	1
113	41.0		18	75.0	44 0	M	C	0	0	0	0	0	0	0	0	0	0	2	2	1	86.0	5	5.00	0
114	80.0		16	71.0	42 0	M	C	1	1	1	3	4	6	2	12	0	2	1	2	1	93.5	6	55.50	15
115	15.5		19	117.0	58 0	M	C	0	0	0	0	0	3	20	23	0	1	0	1	1	28.0	3	76.00	23
116	117.0		11	106.0	53 0	M	A	2	0	0	2	7	1	2	10	0	0	2	2	1	86.0	5	46.00	12
117	104.5		14	97.0	50 0	M	C	4	2	1	7	5	4	7	16	0	1	0	1	2	50.5	4	76.00	23
118	96.0		15	34.0	32 0	M	C	0	0	0	0	8	6	3	17	0	0	1	1	1	28.0	3	60.00	17
119	60.5		17	23.0	30 0	M	B	3	0	0	3	0	5	0	5	0	0	1	2	2	86.0	5	28.50	8
120	80.0		16	49.0	36 0	M	C	3	1	0	4	13	12	8	33	0	1	2	2	2	107.5	7	99.50	37
121	124.5		9	114.0	55 0	M	D	0	0	0	0	15	6	6	27	0	2	0	2	2	93.6	6	83.50	27
122	121.0		10	93.0	49 0	M	D	0	5	0	5	6	16	15	37	0	1	2	2	2	107.5	7	103.00	42
123	117.0		11	115.0	56 0	M	D	0	0	0	0	0	0	0	0	0	0	2	0	1	28.0	3	5.00	0
124	124.5		9	116.0	56 0	M	D	0	0	0	0	0	9	4	13	0	0	0	2	2	50.5	4	51.00	13
125	124.5		9	65.0	40 0	M	D	0	2	0	2	7	9	9	25	0	2	2	2	2	117.0	8	83.50	27
126	117.0		11	70.0	41 0	M	D	1	0	0	1	10	13	10	33	0	2	2	2	2	117.0	8	94.50	34
TO	8001	2050		7990	0	0	0	172	233	138	543	688	715	1028	2431	71	108	75	201	136	8301	591	8064	2974

COLUMN NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
	X3 GRR	GR	X2 AR	AGE	S	R		94	95	96	T	94	95	96	T	1	2	3	4	5	X1 LSR	LS	Y AR	TA
1	15.5	19	3.5	23	0	M	B	2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0	18	22.0	29	0	M	B	1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	15.5	19	7.0	24	0	M	B	2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0	15	41.0	34	0	M	B	1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5	41.0	18	13.0	26	1	M	B	3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6	41.0	18	101.5	51	0	M	B	2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7	104.5	14	99.0	50	0	M	B	0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5	19	120.0	60	1	M	B	1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5	13	105.0	53	0	M	B	1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5	19	21.0	29	0	M	B	0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0	16	101.5	51	0	M	B	3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
87	96.0	15	76.0	44	0	M	B	5	5	4	14	11	1	9	21	0	2	0	2	2	93.5	6	96.00	35
88	80.0	16	33.0	32	0	M	B	0	0	0	0	6	7	2	15	0	0	1	2	1	50.5	4	55.50	15
89	80.0	16	58.0	39	0	M	B	0	1	0	1	9	2	9	20	0	0	2	2	1	86.0	5	70.00	21
90	80.0	16	15.0	28	0	M	B	1	3	0	4	0	15	3	18	0	2	0	1	1	50.5	4	73.00	22
91	80.0	16	111.0	54	0	M	B	5	5	3	13	13	26	16	55	0	2	1	0	2	86.0	5	123.00	68
92	15.5	19	12.0	26	0	M	B	0	1	0	1	8	9	3	20	0	1	0	0	2	28.0	3	70.00	21
93	104.5	14	79.0	44	1	M	B	0	0	0	0	17	5	2	24	0	2	0	2	1	86.0	5	76.00	24
94	60.5	17	25.0	30	1	M	B	1	5	0	6	8	1	5	14	0	2	0	2	2	93.5	6	78.60	20
95	80.0	16	47.0	36	0	M	B	1	5	0	6	15	10	23	48	0	1	0	1	1	28.0	3	116.00	54
96	104.5	14	67.0	41	0	M	B	0	1	1	2	7	9	18	34	2	1	2	2	2	122.5	9	97.50	36
97	110.5	13	35.5	32	1	M	B	0	1	0	1	3	7	11	21	0	0	0	2	0	12.0	2	73.00	22
98	41.0	18	9.0	26	0	M	B	5	4	4	13	10	21	9	40	2	2	0	1	1	93.5	6	115.00	53
99	15.5	19	8.0	24	0	M	B	1	5	0	6	47	39	36	122	2	2	1	2	2	122.5	9	126.00	128
100	15.5	19	20.0	29	0	M	B	5	5	0	10	3	16	18	37	2	2	2	2	2	125.5	10	109.50	47
101	60.5	17	31.0	31	1	M	B	5	5	3	13	22	0	15	37	2	2	2	2	2	125.5	10	111.50	50
102	15.5	19	126.0	64	0	M	B	1	0	0	1	0	11	0	11	0	1	1	2	1	86.0	5	46.00	12
103	124.5	9	37.0	32	1	M	B	0	5	13	18	10	14	9	33	1	2	0	2	2	107.5	7	113.50	51
104	110.5	13	54.0	40	0	M	B	1	0	2	3	11	9	10	30	1	2	0	2	2	107.5	7	93.00	33
105	80.0	16	63.0	40	0	M	B	3	5	0	8	14	11	17	42	0	2	1	2	2	107.5	7	111.50	50
106	15.5	19	121.0	61	0	M	B	4	1	5	10	0	18	17	35	0	2	0	2	2	93.5	6	106.50	45
107	15.5	19	54.0	37	0	M	B	0	0	0	0	18	5	14	37	0	0	2	2	1	86.0	5	99.50	37

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
	X3 GRR	GR	X2 AR	AGE	S	R		94	95	96	T	94	95	96	T	1	2	3	4	5	X1 LSR	LS	Y AR	TA
1	15.5	19	3.5	23 0	M	B		2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0	18	22.0	29 0	M	B		1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	15.5	19	7.0	24 0	M	B		2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0	15	41.0	34 0	M	B		1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5	41.0	18	13.0	26 1	M	B		3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6	41.0	18	101.5	51 0	M	B		2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7	104.5	14	99.0	50 0	M	B		0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5	19	120.0	60 1	M	B		1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5	13	105.0	53 0	M	B		1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5	19	21.0	29 0	M	B		0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0	16	101.5	51 0	M	B		3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
66	96.0	15	112.0	54 0	M	B		1	0	0	1	5	0	5	10	0	0	0	0	2	12.0	2	39.50	11
67	80.0	16	66.0	41 0	M	B		2	5	5	12	9	5	13	27	1	0	0	2	1	50.5	4	101.00	39
68	15.5	19	94.0	49 0	M	B		0	5	1	6	3	0	5	8	1	0	1	2	0	50.5	4	53.50	14
69	41.0	18	43.5	35 0	M	B		5	5	12	22	15	9	33	57	0	2	0	0	2	50.4	4	125.00	79
70	15.5	19	74.0	44 0	M	B		5	5	1	11	0	6	9	15	1	0	0	0	1	12.0	2	82.00	26
71	60.5	17	47.0	36 0	M	B		0	0	0	0	2	0	4	6	1	1	0	2	1	86.0	5	24.50	6
72	80.0	16	24.0	30 0	M	B		1	5	8	14	9	28	10	47	0	2	0	2	1	86.0	5	119.00	61
73	41.0	18	92.0	49 0	M	B		2	1	0	3	18	10	0	28	1	2	0	2	1	93.5	6	90.50	31
74	41.0	18	81.0	46 0	M	B		2	0	0	2	0	3	0	3	0	0	0	2	1	28.0	3	23.00	5
75	41.0	18	78.0	44 1	M	B		1	5	0	6	4	5	4	13	1	1	0	2	1	86.0	5	62.00	19
76	15.5	19	51.0	37 0	M	B		0	5	0	5	8	0	7	15	0	0	0	2	0	12.0	2	78.60	20
77	41.0	18	27.0	31 0	M	B		1	2	0	3	4	8	7	19	0	1	0	2	1	50.5	4	73.00	22
78	41.0	18	58.0	40 0	M	B		0	1	0	1	0	11	0	11	0	0	0	1	1	12.0	2	46.00	12
79	96.0	15	87.0	47 0	M	B		0	0	0	0	2	0	10	12	1	1	1	2	1	93.5	6	46.00	12
80	41.0	18	35.5	32 1	M	B		5	1	0	6	23	18	6	45	1	0	1	2	1	86.0	5	113.50	51
81	41.0	18	119.0	60 0	M	B		5	3	3	11	17	14	22	53	2	2	2	2	0	117.0	8	121.50	64
82	96.	15	19.0	28 1	M	B		0	0	0	0	0	5	1	6	1	0	0	2	1	50.5	4	24.50	6
83	15.5	19	98.0	50 0	M	B		4	1	2	7	8	4	10	22	1	0	0	2	2	86.0	5	87.50	29
84	80.0	16	26.0	31 0	M	B		5	2	0	7	24	19	14	57	1	2	0	2	2	107.5	7	121.50	64
85	41.0	18	90.0	48 1	M	B		5	5	9	19	11	14	29	54	1	2	0	2	2	107.5	7	124.00	73
86	60.5	17	84.0	47 0	M	B		4	5	1	10	12	6	6	24	1	1	1	2	1	93.5	6	94.50	34

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE				TOTAL			TOTAL	
	X3			X2																X1			Y	
	GRR		GR	AR		AGE	S	R	94	95	96	T	94	95	96	T	1	2	3	4	5	LSR	LS	AR	TA
1	15.5		19	3.5	23	0	M	B	2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0		18	22.0	29	0	M	B	1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	15.5		19	7.0	24	0	M	B	2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0		15	41.0	34	0	M	B	1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5	41.0		18	13.0	26	1	M	B	3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6	41.0		18	101.5	51	0	M	B	2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7	104.5		14	99.0	50	0	M	B	0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5		19	120.0	60	1	M	B	1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5		13	105.0	53	0	M	B	1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5		19	21.0	29	0	M	B	0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0		16	101.5	51	0	M	B	3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
66	96.0		15	112.0	54	0	M	B	1	0	0	1	5	0	5	10	0	0	0	0	2	12.0	2	39.50	11
67	80.0		16	66.0	41	0	M	B	2	5	5	12	9	5	13	27	1	0	0	2	1	50.5	4	101.00	39
68	15.5		19	94.0	49	0	M	B	0	5	1	6	3	0	5	8	1	0	1	2	0	50.5	4	53.50	14
69	41.0		18	43.5	35	0	M	B	5	5	12	22	15	9	33	57	0	2	0	0	2	50.4	4	125.00	79
70	15.5		19	74.0	44	0	M	B	5	5	1	11	0	6	9	15	1	0	0	0	1	12.0	2	82.00	26
71	60.5		17	47.0	36	0	M	B	0	0	0	0	2	0	4	6	1	1	0	2	1	86.0	5	24.50	6
72	80.0		16	24.0	30	0	M	B	1	5	8	14	9	28	10	47	0	2	0	2	1	86.0	5	119.00	61
73	41.0		18	92.0	49	0	M	B	2	1	0	3	18	10	0	28	1	2	0	2	1	93.5	6	90.50	31
74	41.0		18	81.0	46	0	M	B	2	0	0	2	0	3	0	3	0	0	0	2	1	28.0	3	23.00	5
75	41.0		18	78.0	44	1	M	B	1	5	0	6	4	5	4	13	1	1	0	2	1	86.0	5	62.00	19
76	15.5		19	51.0	37	0	M	B	0	5	0	5	6	0	7	15	0	0	0	2	0	12.0	2	78.60	20
77	41.0		18	27.0	31	0	M	B	1	2	0	3	4	8	7	19	0	1	0	2	1	50.5	4	73.00	22
78	41.0		18	58.0	40	0	M	B	0	1	0	1	0	11	0	11	0	0	0	1	1	12.0	2	46.00	12
79	96.0		15	87.0	47	0	M	B	0	0	0	0	2	0	10	12	1	1	1	2	1	93.5	6	46.00	12
80	41.0		18	35.5	32	1	M	B	5	1	0	6	23	16	6	45	1	0	1	2	1	86.0	5	113.50	51
81	41.0		18	119.0	60	0	M	B	5	3	3	11	17	14	22	53	2	2	2	2	0	117.0	8	121.50	64
82	96.0		15	19.0	28	1	M	B	0	0	0	0	0	5	1	6	1	0	0	2	1	50.5	4	24.50	6
83	15.5		19	96.0	50	0	M	B	4	1	2	7	8	4	10	22	1	0	0	2	2	86.0	5	87.50	29
84	80.0		16	26.0	31	0	M	B	5	2	0	7	24	19	14	57	1	2	0	2	2	107.5	7	121.50	64
85	41.0		18	90.0	46	1	M	B	5	5	9	19	11	14	29	54	1	2	0	2	2	107.5	7	124.00	73
86	30.5		17	84.0	47	0	M	B	4	5	1	10	12	6	6	24	1	1	1	2	1	93.5	6	94.50	34

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
		X3		X2																	X1		Y	
		GRR	GR	AR	AGE	S	R	94	95	96	T	94	95	96	T	1	2	3	4	5	LSR	LS	AR	TA
1		15.5	19	3.5	23 0	M	B	2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2		41.0	18	22.0	29 0	M	B	1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3		15.5	19	7.0	24 0	M	B	2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4		96.0	15	41.0	34 0	M	B	1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5		41.0	18	13.0	26 1	M	B	3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6		41.0	18	101.5	51 0	M	B	2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7		104.5	14	99.0	50 0	M	B	0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8		15.5	19	120.0	60 1	M	B	1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9		110.5	13	105.0	53 0	M	B	1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10		15.5	19	21.0	29 0	M	B	0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11		80.0	16	101.5	51 0	M	B	3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
45		80.0	16	103.0	52 0	M	B	3	0	0	3	8	3	9	20	1	0	1	2	1	86.0	5	76.00	23
46		96.0	15	53.0	37 0	M	B	0	2	0	2	4	8	6	18	0	1	0	2	0	28.0	3	78.60	20
47		41.0	18	109.0	54 0	M	B	0	0	0	0	0	6	5	11	0	1	2	2	1	93.5	6	39.50	11
48		60.5	17	42.0	34 1	M	B	5	4	0	9	9,5	8	18	35,5	0	1	0	2	2	86.0	5	106.50	45
49		80.0	16	86.0	47 0	M	B	2	0	0	2	3	8	12	23	1	2	0	2	1	93.5	6	80.00	25
50		110.5	13	56.0	38 0	M	B	0	0	0	0	11	0	5	16	2	1	1	1	2	107.5	7	58.00	16
51		60.5	17	29.0	31 0	M	B	0	0	0	0	11	3	15	29	1	0	2	2	0	86.0	5	87.50	29
52		60.5	17	33.0	33 0	M	B	0	0	0	0	4	3	4	11	1	0	0	2	1	50.4	4	39.50	11
53		60.5	17	28.0	31 0	M	B	5	3	10	18	22	4	17	43	1	2	0	2	1	93.5	6	119.00	61
54		80.0	16	40.0	33 1	M	B	0	0	0	0	0	4	5	9	1	1	0	2	0	50.4	4	32.00	9
55		121.0	10	108.0	53 0	M	B	1	5	0	6	0	0	5	5	0	1	0	2	1	50.4	4	39.50	11
56		80.0	16	52.5	37 0	M	B	0	0	0	0	0	1	1	2	0	0	0	2	1	28.0	3	15.00	2
57		80.0	16	123.0	62 1	M	B	5	5	3	13	1	16	10	27	0	1	0	2	2	86.0	5	102.00	40
58		41.0	18	82.0	46 1	M	B	1	5	0	6	6	10	9	25	0	0	1	2	1	50.5	4	90.50	31
59		96.0	15	57.0	39 0	M	B	2	3	0	5	2	5	0	7	0	1	2	2	2	107.5	7	46.00	12
60		80.0	16	89.0	48 0	M	B	0	0	0	0	4	[illegible]	5	9	1	1	1	0	0	28.0	3	32.00	9
61		60.5	17	95.0	50 0	M	B	0	1	0	1	0	0	0	0	1	1	1	2	1	93.5	6	11.50	1
62		60.5	17	62.0	40 0	M	B	0	1	0	1	17	12	17	46	2	2	0	2	2	117.0	8	109.50	47
63		15.5	19	88.0	48 0	M	B	3	5	3	11	2	5	10	17	1	1	1	2	1	93.5	6	85.50	28
64		80.0	16	72.0	42 0	M	B	4	0	0	4	6	2	4	12	0	1	0	1	1	28.0	3	58.00	16
65		114.0	12	61.0	40 0	M	B	0	2	0	2	5	0	3	8	0	0	0	2	1	28.0	3	35.00	10

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
	X3 GRR		GR	X2 AR	AGE	S	R	94	95	96	T	94	95	96	T	1	2	3	4	5	X1 LSR	LS	Y AR	TA
1	15.5		19	3.5	23 0	M	B	2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0		18	22.0	29 0	M	B	1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	13.5		19	7.0	21 0	M	B	2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0		15	41.0	34 0	M	B	1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	28.50	8
5	41.0		18	13.0	26 1	M	B	3	1	0	4	2	0	6		1	0	0	1	0	12.0	2	46.00	12
6	41.0		18	101.5	51 0	M	B	2	0	0	2	7	0	3		1	1	0	2	1	86.0	5	46.00	12
7	104.5		14	99.0	50 0	M	B	0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5		19	120.0	60 1	M	B	1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5		13	105.0	53 0	M	B	1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5		19	21.0	29 0	M	B	0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0		16	101.5	51 0	M	B	3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
24	60.5		17	69.0	41 0	M	B	0	4	0	4	0	0	16	16	0	2	0	2	0	50.5	4	78.60	20
25	15.5		19	16.0	28 0	M	B	0	0	0	0	0	5	4	9	0	0	0	2	2	50.5	4	32.00	9
26	60.5		17	47.0	36 0	M	B	0	0	0	0	0	8	17	25	0	0	0	0	0	2.0	0	80.00	25
27	15.5		19	16.0	28 0	M	B	0	0	0	0	0	3	10	13	0	0	0	1	0	5.5	1	51.00	13
28	15.5		19	83.0	46 1	M	B	0	1	0	1	0	2	0	2	0	0	1	2	1	50.5	4	18.00	3
29	96.0		15	118.0	59 1	M	B	1	2	0	3	0	2	2	4	1	2	0	2	0	86.0	5	26.00	7
30	60.5		17	59.0	39 0	M	B	0	0	0	0	0	0	4	4	1	0	2	1	0	50.5	4	21.00	4
31	60.5		17	113.0	54 0	M	B	3	0	0	3	14	0	19	33	2	0	2	2	2	117.0	8	97.50	36
32	60.5		17	77.0	44 0	M	B	5	0	0	5	4	4	7	15	0	0	0	2	2	50.5	4	78.60	20
33	60.5		17	50.0	36 0	M	B	0	0	0	0	0	0	1	1	1	0	0	2	0	28.0	3	11.50	1
34	15.5		19	2.0	22 1	M	B	0	1	3	4	0	9	30	39	0	1	2	2	2	107.5	7	104.50	43
35	15.5		19	11.0	26 0	M	B	0	0	1	1	0	1	14	15	2	0	0	0	1	28.0	3	58.00	16
36	41.0		18	97.0	50 0	M	B	4	0	1	5	0	0	5	5	2	1	0	2	2	107.5	7	35.00	10
37	121.0		10	107.0	53 0	M	B	0	5	0	5	4	0	2	6	0	0	0	2	2	50.5	4	39.50	11
38	117.0		11	52.5	37 0	M	B	0	3	0	3	0	0	0	0	0	0	2	1	2	86.0	5	18.00	3
39	60.5		17	38.0	33 0	M	B	0	0	2	2	0	6	11	17	1	2	2	1	0	93.5	6	62.00	19
40	96.0		15	80.0	45 0	M	B	2	0	0	2	2	5	1	8	0	0	1	2	0	28.0	3	35.00	10
41	15.5		19	122.0	62 0	M	B	5	5	0	10	0	0	15	15	2	2	2	2	1	122.5	9	80.00	25
42	15.5		19	126.0	69 0	F	B	0	5	0	5	6	0	3	9	0	1	0	2	1	50.5	4	53.50	14
43	110.5		13	43.5	35 0	M	B	5	5	3	13	5	22	19	46	2	2	0	2	2	117.0	8	117.00	59
44	110.5		13	68.0	41 0	M	B	0	0	0	0	0	0	0	0	1	0	0	2	1	50.4	4	5.00	0

APPENDIX 3

TABLE 3.1.

ABSENTEE DATA AND UNHEALTHY LIFESTYLE SCORE PER RESPONDENT

COLUMN NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
								DAYS ABSENT				SICK DAYS				QUESTIONNAIRE					TOTAL		TOTAL	
	X3		X2																		X1		Y	
	GRR	GR	AR	AGE	S	R		94	95	96	T	94	95	96	T	1	2	3	4	5	LSR	LS	AR	TA
1	15.5	19	3.5	23 0	M	B		2	4	0	6	2	3	0	5	1	0	0	1	0	12.0	2	39.50	11
2	41.0	18	22.0	29 0	M	B		1	2	0	3	3	3	10	16	2	2	0	2	1	107.5	7	62.00	19
3	15.5	19	7.0	24 0	M	B		2	0	2	4	6	8	25	39	2	1	1	2	2	117.0	8	104.50	43
4	96.0	15	41.0	34 0	M	B		1	3	0	4	1	0	3	4	2	0	0	1	0	28.0	3	26.50	8
5	41.0	18	13.0	26 1	M	B		3	1	0	4	2	0	6	8	1	0	0	1	0	12.0	2	46.00	12
6	41.0	18	101.5	51 0	M	B		2	0	0	2	7	0	3	10	1	1	0	2	1	86.0	5	46.00	12
7	104.5	14	99.0	50 0	M	B		0	0	0	0	3	0	5	8	1	0	2	2	0	86.0	5	28.50	8
8	15.5	19	120.0	60 1	M	B		1	5	4	10	0	6	5	11	1	1	1	2	0	86.0	5	70.00	21
9	110.5	13	105.0	53 0	M	B		1	2	0	3	0	1	4	5	1	0	0	2	0	28.0	3	28.50	8
10	15.5	19	21.0	29 0	M	B		0	0	0	0	0	0	4	4	0	2	1	2	0	86.0	5	21.00	4
11	80.0	16	101.5	51 0	M	B		3	3	1	7	6	0	0	6	1	1	0	2	2	93.5	6	51.00	13
12	104.5	14	104.0	52 0	M	B		0	1	0	1	0	0	0	0	0	1	0	0	1	12.0	2	11.50	1
13	15.5	19	10.0	26 0	M	B		0	0	0	0	0	0	0	0	1	0	0	2	0	28.0	3	5.00	0
14	80.0	16	85.0	47 0	M	B		0	5	2	7	19	8	12	39	0	2	0	2	1	86.0	5	108.00	46
15	41.0	18	32.0	32 0	M	B		0	5	14	19	0	0	9	9	0	0	0	1	2	28.0	3	85.50	28
16	15.5	19	3.5	23 0	M	B		0	2	0	2	0	0	0	0	0	0	0	1	0	5.5	1	15.00	2
17	41.0	18	5.0	23 0	M	B		0	0	0	0	0	0	0	0	0	1	0	0	0	5.5	1	5.00	0
18	96.0	15	14.0	27 0	M	B		0	0	0	0	0	1	3	4	0	0	0	0	0	2.0	0	21.00	4
19	41.0	18	124.0	62 1	M	B		0	2	0	2	0	0	0	0	0	0	0	0	0	2.0	0	15.00	2
20	41.0	18	18.0	28 0	M	B		0	0	0	0	0	0	0	0	0	0	0	1	0	5.5	1	5.00	0
21	80.0	16	91.0	48 1	M	B		0	2	1	3	7	28	23	58	1	2	2	2	2	122.5	9	119.00	61
22	15.5	19	6.0	23 0	M	B		0	0	9	9	0	3	18	21	0	0	2	1	0	28.0	3	89.00	30
23	104.5	14	110.0	54 0	M	B		0	5	0	5	0	0	27	27	0	1	0	1	0	12.0	2	92.00	32

TABLE 3.1 continued

COLUMN 23 & 24	Column 24 is the total of column 15 and 11 ie the total number of days absent per respondent. Column 23 is the ranking out of 126 respondents of the raw score in column 24 for correlation calculation purposes for each respondent.

TABLE 3.1 continued

COLUMNS 12 13 & 14	The actual days sick leave taken per year per respondent has been entered into these columns for 1994, 1995 and 1996 respectively.
COLUMN 15	The total number of days each respondent has been sick over the last three years has been entered into this column ie the total of columns 12, 13 and 14.
COLUMN 16	This is the raw score for the unhealthy lifestyle question 1 per respondent, i.e. diet.
COLUMN 17	This is the raw score for the unhealthy lifestyle question 2 per respondent i.e. substance abuse.
COLUMN 18	This is the raw score for the unhealthy lifestyle question 3 per respondent i.e. chronic illness.
COLUMN 19	This is the raw score for the unhealthy lifestyle question 4 per respondent i.e. chronic illness.
COLUMN 20	This is the raw score for the unhealthy lifestyle question 5 per respondent i.e. stress management.
COLUMNS 21 & 22	Column 22 is the total of columns 16, 17, 18, 19 and 20 per respondent and column 21 (X1) is the ranking out of 126 respondents of the raw score in column 22 for correlation calculation purposes for each respondent.

APPENDIX 3.1

TABLE 3.1

TABLE OF ALL RESEARCH DATA (RAW SCORES) AS ATTACHED

COLUMN 1	This is the label used per employee. Originally this column was the employee number so that information on absentee and lifestyle questionnaire could be accurately entered. This was later changed to a numerical number to ensure confidentiality.
COLUMN 2&3	Column 3 is the raw score for grade. The actual Peromnes grade has been entered. Column 2 (X3) is the respective Peromnes score ranked out of 126 scores for the purpose of the correlation calculation.
COLUMN 4&5	Column 5 is the actual age of the respondent in years, months and days. Column 4 (X2) is the respective age score ranked out of 126 scores for the purpose of the correlation calculation.
COLUMN 6	This indicates the sex of the respondent
COLUMN 7	This indicates the race of the respondent
COLUMNS 8, 9 & 10	These columns have the actual days absent without permission per respondent per year. (1994 is in Column 8, 1995 is in column 9 and 1996 is in Column 10).
COLUMN 11	This reflects the total number of days each respondent has been absent without permission over the last three years. The total of columns 8, 9 and 10 per respondent.

5. **STRESS** continued

B. What does the employee do about his stress?

Does nothing	
Does the following to relax and relieve stress:	
- Exercises	
- Socialises	
- Meditates	
- Drinks alcohol	
- Smokes cigarettes	
- Loses his/her temper	
- Actively changes stressful factors	
- Engages in a hobby	
- Goes to a movie	
- Watches TV or a video	
- Sleeps	
- Other	

COMMENT:	SCORE

6. **WEIGHT**

Is the incumbent?

Below his/her healthy weight range	
Within his/her healthy weight range	
Above his/her healthy weight range	

COMMENT:	SCORE

4. **EXERCISE**

Does the employee play a sport or engage in regular exercise?

TYPE	HOURS PER WEEK	HOW OFTEN PER WEEK	
COMMENT:			SCORE

5. **STRESS**

A. How stressful does the employee feel his lifestyle to be?

ENVIRONMENT	LOW	MODERATE	HIGH
HOME			
WORK			
COMMENT:			SCORE

done. These rankings have been entered into the respective columns in Table 3.2.

4.2 The actual calculation of the Spearman's Rank Order Correlation Co-efficient and co-efficient of determination per correlation.

Please note the sum of d^2 was used as the original ampersand could not be produced.

4.1.1 Enclosed in Table 4.1.1 is the ranking calculation for columns:

- 3 Job grade Peromnes
- 5 Age
- 22 Total lifestyle behaviours
- 24 Total days absent

as per Table 3.1 in Appendix 3.

This was done in the following way:

Step 1 : The data was sorted from lowest to highest.

Step 2 : The lowest score was ranked one and the highest score 126.

Step 3 : Where there were a number of scores the same the actual ranking of these scores was added and then divided by the number of scores ie. referring to Column 2. Ranks 1 - 30 were added giving a score of 465. This was divided by the number of scores, in this case 30.
These rankings have been entered into respective columns in Table 3.1.

4.1.2 Enclosed in Appendix 4.1.2 is the ranking calculation for Columns 16, 17, 18, 19 and 20 of Appendix 3.1, ie. individual lifestyle scores.

The same process as described ai : was

RANKING CALCULATIONS FOR THE FOLLOWING SCORES:
AGE, GRADE, TOTAL LIFESTYLE, AND TOTAL DAYS ABSENT

TERM	GRADE		AGE		TOTAL LIFESTYLE		TOTAL DAYS ABSENT	
85	16	16	85 47 09	85	24 2064	5	85.5	28
86	17	16	86 48 01	86	1	6		28
87	18	16	87 48 02	87	2	6	87.5	29
88	19	16	88 48 10	88	3	6		29
89	20 80	16	89 48 11	89	4	6	89	30
90	21 1680	16	90 49 00	90	5	6	90.5	31
91	1	15	91 49 01	91	6	6		31
92	2	15	92 49 04	92	7	6	92	32
93	3	15	93 50 01	93	8	6	93	33
94	4	15	94 50 04	94	9	6	94.5	34
95	5	15	95 50 04	95	10	6		34
96	6	15	96 50 04	96	11	6	96	35
97	7	15	97 50 07	97	12	6	97.5	36
98	8	15	98 51 05	98	13	6		36
99	9	15	99.5 51 09	99	14	6	99.5	37
100	10 96	15	99.5 51 09	100	15 93.5	6		37
101	11 1056	15	100.5 52 02	101	16 1496	6	101	39
102	1	14	101.5 52 05	102	1	7	102	40
103	2	14	102.5 53 00	103	2	7	103	42
104	3	14	103.5 53 01	104	3	7	104.5	43
105	4	14	104.5 53 03	105	4	7		43
106	5 104.5	14	105.5 53 06	106	5	7	106.5	45
107	6 627	14	106.5 54 00	107	6	7		45
108	1	13	107.5 54 01	108	7	7	108	46
109	2	13	108.5 54 03	109	8	7	109.5	47
110	3	13	109.5 54 08	110	9	7		47
111	4	13	110.5 54 09	111	10	7	111.5	50
112	5 112.5	13	111.5 55 02	112	11 107.5	7		50
113	6 858	13	112.5 56 05	113	12 1290	7	113.5	51
114	1 114	12	113.5 56 07	114	1	8		51
115	1	11	114.5 58 04	115	2	8	115	53
116	2	11	115.5 59 11	116	3	8	116	54
117	3	11	116.5 60 07	117	4	8	117	59
118	4 117	11	117.5 60 10	118	5	8		61
119	5 585	11	118.5 61 09	119	6 117	8	119	61
120	1	10	119.5 62 05	120	7 819	8		61
121	2 121	10	120.5 62 10	121	1	9	121.5	64
122	3 363	10	121.5 62 11	122	2	9		64
123	1	9	122.5 69 01	123	3 122.5	9	123	68
124	2	9	123.5 21 11	124	4 490	9	124	73
125	3 124.5	9	124.5 35 02	125	125.5	10	125	79
126	4 498	9	125.5 64 01	126	125.5	10	126	126

RANKING CALCULATIONS FOR THE FOLLOWING SCORES:
AGE, GRADE, TOTAL LIFESTYLE, AND TOTAL DAYS ABSENT.

TERM	GRADE		AGE		TOTAL LIFESTYLE		TOTAL DAYS ABSENT	
40	10	18	40	34 01	1	4	4	11
41	11	18	41	34 10	2	4	5 39.5	11
42	12	18	42	35 02	3	4	6 237	11
43	13	18	43	35 02	4	4	1	12
44	14	18	45	36 00	5	4	2	12
45	15	18	45	36 00	6	4	3	12
46	16	18	45	36 00	7	4	4	12
47	17	18	47	36 06	8	4	5	12
48	18	18	48	36 09	9	4	6 49	12
49	19	18	49	37 01	10	4	7 322	12
50	20 41	18	50.5	37 02	11	4		13
51	21 861	18	50.5	37 02	12	4	51	13
52	1	17	52	37 04	13	4		13
53	2	17	53	37 09	14	4	53.5	14
54	3	17	54	38 09	15	4		14
55	4	17	55	39 03	16	4	55.5	15
56	5	17	56	39 06	17	4		15
57	6	17	57	39 07	18	4		16
58	7	17	58	40 01	19	4	58	16
59	8	17	59	40 03	20	4		16
60	9	17	60	40 04	21 50.5	4	60	17
61	10	17	61	40 05	22 1111	4		19
62	11	17	62	40 07	1	5	62	19
63	12	17	63	40 09	2	5		19
64	13	17	64	41 00	3	5	1	20
65	14	17	65	41 01	4	5	2	20
66	15	17	66	41 02	5	5	3	20
67	16	17	67	41 08	6	5	4 66	20
68	17 60.5	17	68	41 09	7	5	5 393	20
69	18 1089	17	69	42 00	8	5		21
70	1	16	70	42 04	9	5	70	21
71	2	16	71	43 00	10	5		21
72	3	16	72	44 00	11	5		22
73	4	16	73	44 01	12	5	73	22
74	5	16	74	44 07	13	5		22
75	6	16	75	44 07	14	5		23
76	7	16	76	44 10	15	5	76	23
77	8	16	77	44 11	16	5		23
78	9	16	78	45 07	17	5	78	24
79	10	16	79	46 08	18	5		25
80	11	16	80	46 10	19	5	80	25
81	12	16	81	46 11	20	5		25
82	13	16	82	47 00	21	5	82	26
83	14	16	83	47 07	22	5	83.5	27
84	15	16	84	47 08	23 86	5		27

APPENDIX 4

TABLE 4.1.1.

RANKING CALCULATIONS FOR THE FOLLOWING SCORES:
AGE, GRADE, TOTAL LIFESTYLE, AND TOTAL DAYS ABSENT.

TERM	GRADE		AGE		TOTAL LIFESTYLE		TOTAL DAYS ABSENT	
1	1	19	1	22 11	1	2 0	1	0
2	2	19	2.5	23 00	2	2 0	2	0
3	3	19	2.5	23 00	3	2 0	3	0
4	4	19	4	23 05	4	1 1	4	0
5	5	19	5	23 05	5	2 1	5	0
6	6	19	6	24 06	6	3 5.5 1	6	0
7	7	19	7	24 09	7	4 22 1	7	0
8	8	19	8	26 01	8	1 2	8 5	0
9	9	19	9	26 02	9	2 2	9 45	0
10	10	19	10	26 07	10	3 2	1	1
11	11	19	11	26 09	11	4 2	2	1
12	12	19	12	26 11	12	5 2	3 11.5	1
13	13	19	13	27 02	13	6 2	4 46	1
14	14	19	14	28 00	14	7 2	1 15	2
15	15	19	15	28 01	15	8 12 2	2 15	2
16	16	19	16	28 01	16	9 108 2	3 15	2
17	17	19	17	28 02	17	1 3	18	3
18	18	19	18	28 10	18	2 3	18	3
19	19	19	19	29 05	19	3 3	18	3
20	20	19	20	29 08	20	4 3	21	4
21	21	19	21	29 09	21	5 3	21	4
22	22	19	22	30 01	22	6 3	21	4
23	23	19	23	30 06	23	7 3	23	5
24	24	19	24	30 10	24	8 3	24.5	6
25	25	19	25	31 00	25	9 3	24.5	6
26	26	3	26	31 01	26	10 3	26	7
27	27	19	27	31 02	27	11 3	28.5	8
28	28	19	28	31 05	28	12 3	28.5	8
29	29 16.5	19	29	31 06	29	13 3	28.5	8
30	30 465	19	30	31 10	30	14 3	28.5	8
31	1	18	31	32 00	31	15 3	32	9
32	2	18	32	32 02	32	16 3	32	9
33	3	18	33	32 05	33	17 3	32	9
34	4	18	34.5	32 10	34	18 3	35	10
35	5	18	34.5	32 10	35	19 3	35	10
36	6	18	36	32 11	36	20 3	35	10
37	7	18	37	33 03	37	21 3	1	11
38	8	18	38	33 06	38	22 28 3	2	11
39	9	18	39	33 10	39	23 644 3	3	11

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1		2		3		4		5		6	
LBL	DIET		SUB ABUSE		CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
122	0,00	36,00	1,00	72,50	2,00	114,00	2,00	82,00	2,00	105,00	107,50	311,50
123	0,00	36,00	0,00	27,50	2,00	114,00	0,00	7,50	1,00	58,50	28,00	188,00
124	0,00	36,00	0,00	27,50	0,00	38,50	2,00	82,00	2,00	105,00	50,50	188,00
125	0,00	36,00	2,00	108,50	2,00	114,00	2,00	82,00	2,00	105,00	117,00	348,50
126	0,00	36,00	2,00	108,50	2,00	114,00	2,00	82,00	2,00	105,00	117,00	348,50

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1		2		3		4		5		6	
LBL	DIET		SUB ABUSE		CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
89	0.00	36.00	0.00	27.50	2.00	114.00	2.00	28.00	1.00	58.50	86.00	210.50
90	0.00	36.00	2.00	108.50	0.00	36.50	1.00	26.00	1.00	58.50	50.50	213.00
91	0.00	36.00	2.00	108.50	1.00	89.00	0.00	7.50	2.00	105.00	86.00	246.00
92	0.00	36.00	1.00	72.50	0.00	36.50	0.00	7.50	2.00	105.00	28.00	157.50
93	0.00	36.00	2.00	108.50	0.00	36.50	2.00	82.00	1.00	58.50	86.00	270.00
94	0.00	36.00	2.00	108.50	0.00	36.50	2.00	82.00	2.00	105.00	93.50	271.00
95	0.00	36.00	1.00	72.50	0.00	36.50	1.00	26.00	1.00	58.50	28.00	176.00
96	2.00	118.50	1.00	72.50	2.00	114.00	2.00	82.00	2.00	105.00	122.50	396.00
97	0.00	36.00	0.00	27.50	0.00	36.50	2.00	82.00	0.00	17.00	12.00	186.00
98	2.00	118.50	2.00	108.50	0.00	36.50	1.00	26.00	1.00	58.50	93.50	297.50
99	2.00	118.50	2.00	108.50	1.00	89.00	2.00	82.00	2.00	105.00	122.50	407.00
100	2.00	118.50	2.00	108.50	2.00	114.00	2.00	82.00	2.00	105.00	125.50	433.00
101	2.00	118.50	2.00	108.50	2.00	114.00	2.00	82.00	2.00	105.00	125.50	433.00
102	0.00	36.00	1.00	72.50	1.00	89.00	2.00	82.00	1.00	58.50	86.00	284.50
103	1.00	91.00	2.00	108.50	0.00	36.50	2.00	82.00	2.00	105.00	107.50	327.00
104	1.00	91.00	2.00	108.50	0.00	36.50	2.00	82.00	2.00	105.00	107.50	327.00
105	0.00	36.00	2.00	108.50	1.00	89.00	2.00	82.00	2.00	105.00	107.50	322.50
106	0.00	36.00	2.00	108.50	0.00	36.50	2.00	82.00	2.00	105.00	93.50	271.00
107	0.00	36.00	0.00	27.50	2.00	114.00	2.00	82.00	1.00	58.50	86.00	264.50
108	0.00	36.00	0.00	27.50	1.00	89.00	1.00	26.00	1.00	58.50	28.00	181.50
109	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	0.00	17.00	28.00	237.50
110	1.00	91.00	0.00	27.50	0.00	36.50	1.00	26.00	2.00	105.00	50.50	187.00
111	0.00	36.00	2.00	108.50	0.00	36.50	0.00	7.50	1.00	58.50	28.00	193.50
112	0.00	36.00	1.00	72.50	0.00	36.50	2.00	82.00	0.00	17.00	28.00	232.00
113	0.00	36.00	0.00	27.50	2.00	114.00	2.00	82.00	1.00	58.50	86.00	264.50
114	0.00	36.00	2.00	108.50	1.00	89.00	2.00	82.00	1.00	58.50	93.50	321.50
115	0.00	36.00	1.00	72.50	0.00	36.50	1.00	26.00	1.00	58.50	28.00	176.00
116	0.00	36.00	0.00	27.50	2.00	114.00	2.00	82.00	1.00	58.50	86.00	264.50
117	0.00	36.00	1.00	72.50	0.00	36.50	1.00	7.50	2.00	105.00	50.50	158.50
118	0.00	36.00	0.00	27.50	1.00	89.00	1.00	26.00	1.00	58.50	28.00	181.50
119	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	2.00	105.00	86.00	239.50
120	0.00	36.00	1.00	72.50	2.00	114.00	2.00	82.00	2.00	105.00	107.50	311.50
121	0.00	36.00	2.00	108.50	0.00	36.50	2.00	82.00	2.00	105.00	93.50	271.00

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1		2		3		4		5		6	
LBL	DIET		SUB ABUSE		CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
56	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	28.00	187.00
57	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	2.00	105.00	86.00	234.00
58	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	1.00	58.50	50.50	238.50
59	0.00	36.00	1.00	72.50	2.00	114.00	2.00	82.00	2.00	105.00	107.50	311.50
60	1.00	91.00	1.00	72.50	1.00	89.00	0.00	7.50	0.00	17.00	28.00	263.00
61	1.00	91.00	1.00	72.50	1.00	89.00	2.00	82.00	1.00	58.50	93.50	340.50
62	2.00	118.50	2.00	108.50	0.00	38.50	2.00	82.00	2.00	105.00	117.00	355.50
63	1.00	36.00	1.00	72.50	1.00	89.00	2.00	82.00	1.00	58.50	93.50	285.50
64	0.00	36.00	1.00	72.50	0.00	38.50	1.00	26.00	1.00	58.50	28.00	176.00
65	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	28.00	187.00
66	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	2.00	105.00	12.00	111.50
67	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	50.50	243.00
68	1.00	9 00	0.00	27.50	1.00	89.00	2.00	82.00	0.00	17.00	50.50	293.50
69	0.00	36.00	2.00	108.50	0.00	38.50	0.00	7.50	2.00	105.00	50.40	194.50
70	1.00	91.00	0.00	27.50	0.00	38.50	0.00	7.50	1.00	58.50	12.00	166.50
71	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	289.00
72	0.00	36.00	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	270.00
73	1.00	91.00	2.00	108.5	0.00	38.50	2.00	82.00	1.00	58.50	93.50	326.00
74	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	28.00	187.00
75	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	289.00
76	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	12.00	186.00
77	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	50.50	233.00
78	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	1.00	58.50	12.00	130.00
79	1.00	91.00	1.00	72.50	1.00	89.00	2.00	82.00	1.00	58.50	93.50	340.50
80	1.00	91.00	0.00	27.50	1.00	89.00	2.00	82.00	1.00	58.50	86.00	294.50
81	2.00	118.50	2.00	108.50	2.00	114.00	2.00	82.00	0.00	17.00	117.00	431.00
82	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	50.50	243.00
83	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	2.00	105.00	86.00	244.00
84	1.00	91.00	2.00	108.50	0.00	38.50	2.00	82.00	2.00	105.00	107.50	327.00
85	1.00	91.00	2.00	108.50	0.00	38.50	2.00	82.00	2.00	105.00	107.50	327.00
86	1.00	91.00	1.00	72.50	1.00	89.00	2.00	82.00	1.00	58.50	93.50	340.50
87	0.00	36.00	2.00	108.50	0.00	38.50	2.00	82.00	2.00	105.00	93.50	271.00
88	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	1.00	58.50	50.50	238.50

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1		2		3		4		5		6	
LBL	DIET		SUB ABUSE		CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
23	0.00	36.00	1.00	72.50	0.00	38.50	1.00	26.00	0.00	17.00	12.00	175.00
24	0.00	36.00	2.00	108.50	0.00	38.50	2.00	82.00	0.00	17.00	50.50	269.00
25	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	2.00	105.00	50.50	188.00
26	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	0.00	17.00	2.00	109.50
27	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	5.50	129.00
28	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	1.00	58.50	50.50	238.50
29	1.00	91.00	2.00	108.50	0.00	38.50	2.00	82.00	0.00	17.00	86.00	325.00
30	1.00	91.00	0.00	27.50	2.00	114.00	1.00	26.00	0.00	17.00	50.50	262.50
31	2.00	118.50	0.00	27.50	2.00	114.00	2.00	82.00	2.00	105.00	117.00	350.00
32	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	2.00	105.00	50.50	188.00
33	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	242.00
34	0.00	36.00	1.00	72.50	2.00	114.00	2.00	82.00	2.00	105.00	107.50	311.50
35	2.00	118.50	0.00	27.50	0.00	38.50	0.00	7.50	1.00	58.50	28.00	195.00
36	2.00	118.50	1.00	72.50	0.00	38.50	2.00	82.00	2.00	105.00	107.50	318.50
37	0.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	2.00	105.00	50.50	188.00
38	0.00	36.00	0.00	27.50	2.00	114.00	1.00	26.00	2.00	105.00	86.00	208.50
39	1.00	91.00	2.00	108.50	2.00	114.00	1.00	26.00	0.00	17.00	93.50	345.50
40	0.00	36.00	0.00	27.50	1.00	89.00	2.00	82.00	0.00	17.00	28.00	237.50
41	2.00	118.50	2.00	108.50	2.00	114.00	2.00	82.00	1.00	58.50	122.50	432.00
42	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	50.50	233.00
43	2.00	118.50	2.00	108.50	0.00	38.50	2.00	82.00	2.00	105.00	117.00	355.50
44	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	50.40	243.00
45	1.00	91.00	0.00	27.50	1.00	89.00	2.00	82.00	1.00	58.50	86.00	294.50
46	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	232.00
47	0.00	36.00	1.00	72.50	2.00	114.00	2.00	82.00	1.00	58.50	93.50	310.50
48	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	2.00	105.00	86.00	234.00
49	1.00	91.00	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	93.50	326.00
50	2.00	118.50	1.00	72.50	1.00	89.00	1.00	26.00	2.00	105.00	107.50	313.00
51	1.00	91.00	0.00	27.50	2.00	114.00	2.00	82.00	0.00	17.00	86.00	319.50
52	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	1.00	58.50	50.40	243.00
53	1.00	91.00	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	93.50	326.00
54	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	0.00	17.00	50.40	288.00
55	0.00	36.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	50.40	233.00

APPENDIX 3

TABLE 3.2

RANKING OF EACH INDIVIDUAL LIFESTYLE BEHAVIOUR
FOR THE CALCULATION OF *d* FOR SPEARMAN'S
CORRELATION CO-EFFICIENT

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1		2		3		4		5		6	
LBL	DIET		SUB ABUSE		CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
1	1.00	91.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	12.00	185.00
2	2.00	118.50	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	107.50	354.50
3	2.00	118.50	1.00	72.50	1.00	89.00	2.00	82.00	2.00	105.00	117.00	370.00
4	2.00	118.50	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	28.00	213.50
5	1.00	91.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	12.00	185.00
6	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	289.00
7	1.00	91.00	0.00	27.50	2.00	114.00	2.00	82.00	0.00	17.00	86.00	319.50
8	1.00	91.00	1.00	72.50	1.00	89.00	2.00	82.00	0.00	17.00	86.00	339.50
9	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	242.00
10	0.00	36.00	2.00	108.50	1.00	89.00	2.00	82.00	0.00	17.00	86.00	320.50
11	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	2.00	105.00	93.50	290.00
12	0.00	36.00	1.00	72.50	0.00	38.50	0.00	7.50	1.00	58.50	12.00	156.50
13	1.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	187.00
14	0.00	36.00	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	270.00
15	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	2.00	105.00	28.00	131.00
16	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	5.50	129.00
17	0.00	36.00	1.00	72.50	0.00	38.50	0.00	7.50	0.00	17.00	5.50	156.50
18	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	0.00	17.00	2.00	109.50
19	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	0.00	17.00	2.00	109.50
20	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	5.50	129.00
21	1.00	91.00	2.00	108.50	2.00	114.00	2.00	82.00	2.00	105.00	122.50	404.50
22	0.00	36.00	0.00	27.50	2.00	114.00	1.00	26.00	0.00	17.00	28.00	206.50

APPENDIX 3

TABLE 3.2

RANKING OF EACH INDIVIDUAL LIFESTYLE BEHAVIOUR
FOR THE CALCULATION OF d FOR SPEARMAN'S
CORRELATION CO-EFFICIENT

1	2	3	4	5	6	7	8	9	10	11	12	13
EE	1				3		4		5		6	
LBL	DIET		SL	SE	CHRONIC ILL		EXCERISE		STRESS MGT		TOTAL	TOTAL
	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	SCORE	RANK	RANK	SCORE
1	1.00	91.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	12.00	185.00
2	2.00	118.50	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	107.50	354.50
3	2.00	118.50	1.00	72.50	1.00	89.00	2.00	82.00	2.00	105.00	117.00	370.00
4	2.00	118.50	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	28.00	213.50
5	1.00	91.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	12.00	185.00
6	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	289.00
7	1.00	91.00	0.00	27.50	2.00	114.00	2.00	82.00	0.00	17.00	86.00	319.50
8	1.00	91.00	1.00	72.50	1.00	89.00	2.00	82.00	0.00	17.00	86.00	339.50
9	1.00	91.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	242.00
10	0.00	36.00	2.00	108.50	1.00	89.00	2.00	82.00	0.00	17.00	86.00	320.50
11	1.00	91.00	1.00	72.50	0.00	38.50	2.00	82.00	2.00	105.00	93.50	290.00
12	0.00	36.00	1.00	72.50	0.00	38.50	0.00	7.50	1.00	58.50	12.00	156.50
13	1.00	36.00	0.00	27.50	0.00	38.50	2.00	82.00	0.00	17.00	28.00	187.00
14	0.00	36.00	2.00	108.50	0.00	38.50	2.00	82.00	1.00	58.50	86.00	270.00
15	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	2.00	105.00	28.00	131.00
16	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	5.50	129.00
17	0.00	36.00	1.00	72.50	0.00	38.50	0.00	7.50	0.00	17.00	5.50	155.50
18	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	0.00	17.00	2.00	109.50
19	0.00	36.00	0.00	27.50	0.00	38.50	0.00	7.50	0.00	17.00	2.00	109.50
20	0.00	36.00	0.00	27.50	0.00	38.50	1.00	26.00	0.00	17.00	5.50	129.00
21	1.00	91.00	2.00	108.50	2.00	114.00	2.00	82.00	2.00	105.00	122.50	404.50
22	0.00	36.00	0.0	27.50	2.00	114.00	1.00	26.00	0.00	17.00	28.00	206.50

TABLE OF INDIVIDUAL LIFESTYLE SCORE AND RESPECTIVE RANKING

Since this data did not fit onto Appendix 3.1 spreadsheet it has been put into Appendix 3.2.

COLUMN 1	This is the label used per employee. Please see note Column 1, Appendix 3.1.
COLUMN 2	This is the raw score as per Column 16 in Appendix 3.1.
COLUMN 3	This is the ranking out of 126 given to the respective score in Column 2.
COLUMN 4	This is the raw score as per Column 17 in Appendix 3.1.
COLUMN 5	This is the ranking out of 126 given to the respective score in Column 4.
COLUMN 6	This is the raw score as per Column 18.
COLUMN 7	This is the ranking out of 126 given to the respective score in Column 6.
COLUMN 8	This is the raw score as per Column 19.
COLUMN 9	This is the ranking out of 126 given to the respective score in Column 8.
COLUMN 10	This is the raw score as per Column 20.
COLUMN 11	This is the ranking out of 126 given to the respective score in Column 10.

4.2.3 AGE AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 339002,8}{126\ (126 \times 126-1)}$$

therefore $$r = 1 \quad \frac{2034016,8}{,000250}$$

therefore $r = 1 - 1,10$

therefore $r = -0,1$

therefore $r^2 = 0,1$

RANK GRADE	RANK DAYS ABSENT	DIFFERNCE d	SQUARED DIFFERENCE d x d
60.50	94.50	-34.00	1156.00
96.00	96.00	0.00	0.00
80.00	55.50	24.50	600.25
80.00	70.00	10.00	100.00
80.00	73.00	7.00	49.00
80.00	123.00	-43.00	1849.00
15.50	70.00	-54.50	2970.25
104.50	78.00	26.50	702.25
60.50	78.60	-18.10	327.61
80.00	116.00	-36.00	1296.00
104.50	97.50	7.00	49.00
110.50	73.00	37.50	1406.25
41.00	115.00	-74.00	5476.00
15.50	126.00	-110.50	12210.25
15.50	109.50	-94.00	8836.00
60.50	111.50	-51.00	2601.00
15.50	46.00	-30.50	930.25
124.50	113.50	11.00	121.00
110.50	93.00	17.50	306.75
80.00	111.50	-31.50	992.25
15.50	106.50	-91.00	8281.00
15.50	99.50	-84.00	7056.00
15.50	18.00	-2.50	6.25
15.50	5.00	10.50	110.25
15.50	5.00	10.50	110.25
117.00	5.00	112.00	12544.00
15.50	11.50	4.00	16.00
41.00	5.00	36.00	1296.00
80.00	55.50	24.50	600.25
15.50	76.00	-60.50	3660.25
117.00	46.00	71.00	5041.00
104.50	76.00	28.50	812.25
96.00	60.00	36.00	1296.00
60.50	28.50	32.00	1024.00
80.00	99.50	-19.50	380.25
124.50	83.50	41.00	1681.00
121.00	103.00	18.00	324.00
117.00	5.00	112.00	12544.00
124.50	51.00	73.50	5402.25
124.50	83.50	41.00	1681.00
117.00	94.50	22.50	506.25
		TOTAL	331128.20

RANK GRADE	RANK DAYS ABSENT	DIFFERNCE d	SQUARED DIFFERENCE d x d
117.00	18.00	99.00	9801.00
60.50	62.00	-1.50	2.25
96.00	35.00	61.00	3721.00
15.50	80.00	-64.50	4160.25
15.50	53.50	-38.00	1444.00
110.50	117.00	-6.50	42.25
110.50	5.00	105.50	11130.25
80.00	76.00	4.00	16.00
96.00	78.60	17.40	302.76
41.00	39.50	1.50	2.25
60.50	106.50	-46.00	2116.00
80.00	80.00	0.00	0.00
110.50	58.00	52.50	2756.25
60.50	87.50	-27.00	729.00
60.50	39.50	21.00	441.00
60.50	119.00	-58.50	3422.25
80.00	32.00	48.00	2304.00
121.00	39.50	81.50	6642.25
80.00	15.00	65.00	4225.00
80.00	102.00	-22.00	484.00
41.00	90.50	-49.50	2450.25
96.00	46.00	50.00	2500.00
80.00	32.00	48.00	2304.00
60.50	11.50	49.00	2401.00
60.50	109.50	-49.00	2401.00
15.50	85.50	-70.00	4900.00
80.00	58.00	22.00	484.00
114.00	35.00	79.00	6241.00
96.00	39.50	56.50	3192.25
80.00	101.00	-21.00	441.00
15.50	53.50	-38.00	1444.00
41.00	125.00	-84.00	7056.00
15.50	82.00	-66.50	4422.25
60.50	24.50	36.00	1296.00
80.00	119.00	-39.00	1521.00
41.00	90.50	-49.50	2450.25
41.00	23.00	18.00	324.00
41.00	62.00	-21.00	441.00
15.50	78.60	-63.10	3981.61
41.00	73.00	-32.00	1024.00
41.00	46.00	-5.00	25.00
96.00	46.00	50.00	2500.00
41.00	113.50	-72.50	5256.25
41.00	121.50	-80.50	6480.25
96.00	24.50	71.50	5112.25
15.50	87.50	-72.00	5184.00
80.00	121.50	-41.50	1722.25
41.00	124.00	-83.00	6889.00

APPENDIX 4

TABLE 4.2.2.

RANK SCORE OF GRADE AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE, SQUARED DIFFERENCE AND SUM OF THE SQUARED DIFFERENCE.

RANK GRADE	RANK DAYS ABSENT	DIFFERNCE d	SQUARED DIFFERENCE d x d
15,50	39,50	-24,00	576,00
41,00	62,00	-21,00	441,00
15,50	104,50	-89,00	7921,00
96,00	28,50	67,50	4556,25
41,00	46,00	-5,00	25,00
41,00	46,00	-5,00	25,00
104,50	28,50	76,00	5776,00
15,50	70,00	-54,50	2970,25
110,50	28,50	82,00	6724,00
15,50	21,00	-5,50	30,25
80,00	51,00	29,00	841,00
104,50	11,50	93,00	8649,00
15,50	5,00	10,50	110,25
80,00	108,00	-28,00	784,00
41,00	85,50	-44,50	1980,25
15,50	15,00	0,50	0,25
41,00	5,00	36,00	1296,00
96,00	21,00	75,00	5625,00
41,00	15,00	26,00	676,00
41,00	5,00	36,00	296,00
80,00	119,00	-39,00	1521,00
15,50	89,00	-73,50	5402,25
104,50	92,00	12,50	156,25
60,50	78,60	-18,10	327,61
15,50	32,00	-16,50	272,25
60,50	80,00	-19,50	380,25
15,50	51,00	-35,50	1260,25
15,50	18,00	-2,50	6,25
96,00	26,00	70,00	4900,00
60,50	21,00	39,50	1560,25
60,50	97,50	-37,00	1369,00
60,50	78,60	-18,10	327,61
60,50	11,50	49,00	2401,00
15,50	104,50	-89,00	7921,00
15,50	58,00	-42,50	1806,25
41,00	35,00	6,00	36,00
121,00	39,50	81,50	6642,25

4.2.2 GRADE AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 331128,2}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{1986769,2}{2000250}$$

therefore $r = 1 - 0,99$

therefore $r = 0,00674$

therefore $r^2 = 0,0001$

RANK TOTAL LIFESTYLE BEHAVIOUR	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
107.50	124.00	-16.50	272.25
93.50	94.50	-1.00	1.00
93.50	96.00	-2.50	6.25
50.50	55.50	-5.00	25.00
86.00	70.00	16.00	256.00
50.50	73.00	-22.50	506.25
86.00	123.00	-37.00	1369.00
28.00	70.00	-42.00	1764.00
86.00	78.00	8.00	64.00
93.50	78.60	14.90	222.01
28.00	116.00	-88.00	7744.00
122.50	97.50	25.00	625.00
12.00	73.00	-61.00	3721.00
93.50	115.00	-21.50	462.25
122.50	126.00	-3.50	12.25
125.50	109.50	16.00	256.00
125.50	111.50	14.00	196.00
86.00	46.00	40.00	1600.00
107.50	113.50	-6.00	36.00
107.50	93.00	14.50	210.25
107.50	111.50	-4.00	16.00
93.50	106.50	-13.00	169.00
86.00	99.50	-13.50	182.25
28.00	18.00	10 00	100.00
28.00	5.00	23.00	529.00
50.50	5.00	45.50	2070.25
28.00	5.00	23.00	529.00
28.00	11.50	16.50	272.25
86.00	5.00	81.00	6561.00
93.50	55.50	38.00	1444.00
28.00	76.00	-48.00	2304.00
86.00	46.00	40.00	1600.00
50.50	76.00	-25.50	650.25
28.00	60.00	-32.00	1024.00
86.00	28.50	57.50	3306.25
107.50	99.50	8.00	64.00
93.60	83.50	10.10	102.01
107.50	103.00	4.50	20.25
28.00	5.00	23.00	529.00
50.50	51.00	-0.50	0.25
117.00	83.50	33.50	1122.25
117.00	94.5u	22.50	506.25
		TOTAL	157679.66

RANK TOTAL LIFESTYLE BEHAVIOUR	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
86,00	18,00	68,00	4624,00
93,50	62,00	31,50	992,25
28,00	35,00	-7,00	49,00
122,50	80,00	42,50	1806,25
50,50	53,50	-3,00	9,00
117,00	117,00	0,00	0,00
50,40	5,00	45,40	2061,16
86,00	76,00	10,00	100,00
28,00	78,60	-50,60	2560,36
93,50	39,50	54,00	2916,00
86,00	106,50	-20,50	420,25
93,50	80,00	13,50	182,25
107,50	58,00	49,50	2450,25
86,00	87,50	-1,50	2,25
50,40	39,50	10,90	118,81
93,50	119,00	-25,50	650,25
50,40	32,00	18,40	338,56
50,40	39,50	10,90	118,81
28,00	15,00	13,00	169,00
86,00	102,00	-16,00	256,00
50,50	90,50	-40,00	1600,00
107,50	46,00	61,50	3782,25
28,00	32,00	-4,00	16,00
93,50	11,50	82,00	6724,00
117,00	109,50	7,50	56,25
93,50	85,50	8,00	64,00
28,00	58,00	-30,00	900,00
28,00	35,00	-7,00	49,00
12,00	39,50	-27,50	756,25
50,50	101,00	-50,50	2550,25
50,50	53,50	-3,00	9,00
50,40	125,00	-74,60	5565,16
12,00	82,00	-70,00	4900,00
86,00	24,50	61,50	3782,25
86,00	119 00	-33,00	1089,00
93,50	90,50	3,00	9,00
28,00	23,00	5,00	25,00
86,00	62,00	24,00	576,00
12,00	78,60	-66,60	4435,56
50,50	73,00	-22,50	506,25
12,00	46,00	-34,00	1156,00
93,50	46,00	47,50	2256,25
86,00	113,50	-27,50	756,25
117,00	121,50	-4,50	20,25
50,50	24,50	26,00	676,00
86,00	87,50	-1,50	2,25
107,50	121,50	-14,00	196,00

APPENDIX 4

TABLE 4.2.1.

RANK SCORE OF TOTAL LIFESTYLE BEHAVIOUR AND DAYS ABSENT PER RESPONDANT WITH THE DIFFERENCE,SQUARED DIFFERENCE AND SUM OF SQUARED DIFFERENCE.

RANK TOTAL LIFESTYLE BEHAVIOUR	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
12,00	39,50	-27,50	756,25
107,50	62,00	45,50	2070,25
117,00	104,50	12,50	156,25
28,00	28,50	-0,50	0,25
12,00	46,00	-34,00	1156,00
86,00	46,00	40,00	1600,00
86,00	28,50	57,50	3306,25
86,00	70,00	16,00	256,00
28,00	28,50	-0,50	0,25
86,00	21,00	65,00	4225,00
93,50	51,00	42,50	1806,25
12,00	11,50	0,50	0,25
28,00	5,00	23,00	529,00
86,00	108,00	-22,00	484,00
28,00	85,50	-57,50	3306,25
5,50	15,00	-9,50	90,25
5,50	5,00	0,50	0,25
2,00	21,00	-19,00	361,00
2,00	15,00	-13,00	169,00
5,50	5,00	0,50	0,25
122,50	119,00	3,50	12,25
28,00	89,00	-61,00	3721,00
12,00	92,00	-80,00	6400,00
50,50	78,60	-28,10	789,61
50,50	32,00	18,50	342,25
2,00	80,00	-78,00	6084,00
5,50	51,00	-45,50	2070,25
50,50	18,00	32,50	1056,25
86,00	26,00	60,00	3600,00
50,50	21,00	29,50	870,25
117,00	97,50	19,50	380,25
50,50	78,60	-28,10	789,61
28,00	11,50	16,50	272,25
107,50	104,50	3,00	9,00
28,00	58,00	-30,00	900,00
107,50	35,00	72,50	5256,25
50,50	39,50	11,00	121,00

4.2.1 POOR LIFESTYLE BEHAVIOUR (TOTAL) AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below.

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 157679,7}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{946077,96}{2000250}$$

therefore $$r = 1 - 0,47$$

therefore $$r = 0,53$$

therefore $$r^2 = 0,28$$

RANKING CALCULATIONS FOR INDIVIDUAL LIFESTYLE BEHAVIOUR SCORES										
TERM	LIFESTYLE 1		LIFESTYLE 2		LIFESTYLE 3		LIFESTYLE 4		LIFESTYLE 5	
91	1	20	2	1	1	15	2	54	2	8
92	1	21	2	2	1	16	2	55	2	9
93	1	22	2	3	1	17	2	56	2	10
94	1	23	2	4	1	18	2	57	2	11
95	1	24	2	5	1	19	2	58	2	12
96	1	25	2	6	1	20	2	59	2	13
97	1	26	2	7	1	21	2	60	2	14
98	1	27	2	8	1	22	2	61	2	15
99	1	28	2	9	1	23	2	62	2	16
100	1	29	2	10	1	24	89	2	63	2	17
101	1	30	2	11	1	25	2225	2	64	2	18
102	1	31	2	12	2	1	2	65	2	19
103	1	32	2	13	2	2	2	66	2	20
104	1	33	2	14	2	3	2	67	2	21
105	1	34	2	15	2	4	2	68	2	22
106	1	35	2	16	2	5	2	69	2	23
107	1	36	2	17	2	6	2	70	2	24
108	1	37	2	18	2	7	2	71	2	25
109	1	38	91	2	19	2	8	2	72	2	26
110	1	39	3549	2	20	2	9	2	73	2	27
111	2	1	2	21	2	10	2	74	2	28
112	2	2	2	22	2	11	2	75	2	29
113	2	3	2	23	2	12	2	76	2	30
114	2	4	2	24	2	13	2	77	2	31
115	2	5	2	25	2	14	2	78	2	32
116	2	6	2	26	2	15	2	79	2	33
117	2	7	2	27	2	16	2	80	2	34
118	2	8	2	28	2	17	2	81	2	35
119	2	9	2	29	2	18	2	82	2	36
120	2	10	2	30	2	19	2	83	2	37
121	2	11	2	31	2	20	2	84	2	38
122	2	12	2	32	2	21	2	85	2	39
123	2	13	2	33	2	22	2	86	2	40
124	2	14	2	34	2	23	2	87	2	41
125	2	15	118.5	2	35	198.5	2	24	114	2	88	52	2	42	105
126	2	16	1896	2	36	3906	2	25	2850	2	89	7298	2	43	4515

RANKING CALCULATIONS FOR INDIVIDUAL LIFESTYLE BEHAVIOUR SCORES

TERM	LIFESTYLE 1		LIFESTYLE 2		LIFESTYLE 3		LIFESTYLE 4		LIFESTYLE 5	
43	0	43	0	43	0	43	2	6	1	10
44	0	44	0	44	0	44	2	7	1	11
45	0	45	0	45	0	45	2	8	1	12
46	0	46	0	46	0	46	2	9	1	13
47	0	47	0	47	0	47	2	10	1	14
48	0	48	0	48	0	48	2	11	1	15
49	0	49	0	49	0	49	2	12	1	16
50	0	50	0	50	0	50	2	13	1	17
51	0	51	0	51	0	51	2	14	1	18
52	0	52	0	52	0	52	2	15	1	19
53	0	53	0	53	27.5	0	53	2	16	1
54	0	54	0	54	1485	0	54	2	17	1
55	0	55	1	1		0	55	2	18	1
56	0	56	1	2		0	56	2	19	1
57	0	57	1	3		0	57	2	20	1
58	0	58	1	4		0	58	2	21	1
59	0	59	1	5		0	59	2	22	1
60	0	60	1	6		0	60	2	23	1
61	0	61	1	7		0	61	2	24	1
62	0	62	1	8		0	62	2	25	1
63	0	63	1	9		0	63	2	26	1
64	0	64	1	10		0	64	2	27	1
65	0	65	1	11		0	65	2	28	1
66	0	66	1	12		0	66	2	29	1
67	0	67	1	13		0	67	2	30	1
68	0	68	1	14		0	68	2	31	1
69	0	69	1	15		0	69	2	32	1
70	0	70	35	1	16		0	70	2	33
71	0	71	2556	1	17		0	71	2	34
72	1	1		1	18		0	72	2	35
73	1	2		1	19		0	73	2	36
74	1	3		1	20		0	74	2	37
75	1	4		1	21		0	75	33.5	2
76	1	5		1	22		0	76	2925	2
77	1	6		1	23		1	1		2
78	1	7		1	24		1	2		2
79	1	8		1	25		1	3		2
80	1	9		1	26		1	4		2
81	1	10		1	27		1	5		2
82	1	11		1	28		1	6		2
83	1	12		1	29		1	7		2
84	1	13		1	30		1	8		2
85	1	14		1	31		1	9		2
86	1	15		1	32		1	10		2
87	1	16		1	33		1	11		2
88	1	17		1	34		1	12		2
89	1	18		1	35	72.5	1	13		2
90	1	19		1	36	2610	1	14		2

TERM	LIFESTYLE 4		LIFESTYLE 5	
43	2	6	1	10
44	2	7	1	11
45	2	8	1	12
46	2	9	1	13
47	2	10	1	14
48	2	11	1	15
49	2	12	1	16
50	2	13	1	17
51	2	14	1	18
52	2	15	1	19
53	2	16	1	20
54	2	17	1	21
55	2	18	1	22
56	2	19	1	23
57	2	20	1	24
58	2	21	1	25
59	2	22	1	26
60	2	23	1	27
61	2	24	1	28
62	2	25	1	29
63	2	26	1	30
64	2	27	1	31
65	2	28	1	32
66	2	29	1	33
67	2	30	1	34
68	2	31	1	35
69	2	32	1	36
70	2	33	1	37
71	2	34	1	38
72	2	35	1	39
73	2	36	1	40
74	2	37	1	41
75	2	38	1	42
76	2	39	1	43
77	2	40	1	44
78	2	41	1	45
79	2	42	1	46
80	2	43	1	47
81	2	44	1	48
82	2	45	1	49
83	2	46	1	50
84	2	47	2	1
85	2	48	2	2
86	2	49	2	3
87	2	50	2	4
88	2	51	2	5
89	2	52	2	6
90	2	53	2	7

APPENDIX 4

TABLE 4.1.2.

RANKING CALCULATIONS FOR INDIVIDUAL LIFESTYLE BEHAVIOUR SCORES

TERM	LIFESTYLE 1	LIFESTYLE 2	LIFESTYLE 3	LIFESTYLE 4	LIFESTYLE 5
1	0 1	0 1	0 1	0 1	0 1
2	0 2	0 2	0 2	0 2	0 2
3	0 3	0 3	0 3	0 3	0 3
4	0 4	0 4	0 4	0 4	0 4
5	0 5	0 5	0 5	0 5	0 5
6	0 6	0 6	0 6	0 6	0 6
7	0 7	0 7	0 7	0 7	0 7
8	0 8	0 8	0 8	0 8	0 8
9	0 9	0 9	0 9	0 9	0 9
10	0 10	0 10	0 10	0 10	0 10
11	0 11	0 11	0 11	0 11	0 11
12	0 12	0 12	0 12	0 12	0 12
13	0 13	0 13	0 13	0 13 7.5	0 13
14	0 14	0 14	0 14	0 14 105	0 14
15	0 15	0 15	0 15	1 1	0 15
16	0 16	0 16	0 16	1 2	0 16
17	0 17	0 17	0 17	1 3	0 17
18	0 18	0 18	0 18	1 4	0 18
19	0 19	0 19	0 19	1 5	0 19
20	0 20	0 20	0 20	1 6	0 20
21	0 21	0 21	0 21	1 7	0 21
22	0 22	0 22	0 22	1 8	0 22
23	0 23	0 23	0 23	1 9	0 23
24	0 24	0 24	0 24	1 10	0 24
25	0 25	0 25	0 25	1 11	0 25
26	0 26	0 26	0 26	1 12	0 26
27	0 27	0 27	0 27	1 13	0 27
28	0 28	0 28	0 28	1 14	0 28
29	0 29	0 29	0 29	1 15	0 29
30	0 30	0 30	0 30	1 16	0 30
31	0 31	0 31	0 31	1 17	0 31
32	0 32	0 32	0 32	1 18	0 32 17
33	0 33	0 33	0 33	1 19	0 33 561
34	0 34	0 34	0 34	1 20	1 1
35	0 35	0 35	0 35	1 21	1 2
36	0 36	0 36	0 36	1 22 28	1 3
37	0 37	0 37	0 37	1 23 598	1 4
38	0 38	0 38	0 38	2 1	1 5
39	0 39	0 39	0 39	2 2	1 6
40	0 40	0 40	0 40	2 3	1 7
41	0 41	0 41	0 41	2 4	1 8
42	0 42	0 42	0 42	2 5	1 9

4.2.6 CHRONIC DISEASE AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 265347,3}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{1592083,8}{2000250}$$

therefore $$r = 1 - 0,79$$

therefore $$r = 0,20$$

therefore $$r^2 = 0,042$$

RANK SUBSTANCE ABUSE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
108,50	96,00	12,50	156,25
27,50	55,50	-28,00	784,00
27,50	70,00	-42,50	1806,25
108,50	73,00	35,50	1260,25
108,50	123,00	-14,50	210,25
72,50	70,00	2,50	6,25
108,50	78,00	30,50	930,25
108,50	78,60	29,90	894,(
72,50	116,00	-43,50	1892,25
72,50	[illegible],50	-25,00	625,00
27,50	73,00	-45,50	2070,25
108,50	115,00	-6,50	42,25
108,50	126,00	-17,50	306,25
108,50	109,50	-1,00	1,00
108,50	111,50	-3,00	9,00
72,50	46,00	26,50	702,25
108,50	113,50	-5,00	25,00
108,50	[illegible] 0	15,50	240,25
108,50	111,50	-3,00	9,00
108,50	106,50	2,00	4,00
27,50	99,50	-72,00	5184,00
27,50	18,00	9,50	90,25
27,50	5,00	22,50	506,25
27,50	5,00	22,50	506,25
108,50	5,00	103,50	10712,25
72,50	11,50	61,00	3721,00
27,50	5,00	22,50	506,25
108,50	55,50	53,00	2809,00
72,50	76,00	-3,50	12,25
27,50	46,00	-18,50	342,25
72,50	76,00	-3,50	12,25
27,50	60,00	-32,50	1056,25
27,50	28,50	-1,00	1,00
72,50	99,50	-27,00	729,00
108,50	83,50	25,00	625,00
72,50	103,00	-30,50	930,25
27,50	5,00	22,50	506,25
27,50	51,00	-23,50	552,25
108,50	83,50	25,00	625,00
108,50	94,50	14,00	196,00
		TOTAL	149667,40

RANK SUBSTANCE ABUSE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
108,50	62,00	46,50	2162,25
27,50	35,00	-7,50	56,25
108,50	80,00	28,50	812,25
72,50	53,50	19,00	361,00
108,50	117,00	-8,50	72,25
27,50	5,00	22,50	506,25
27,50	76,00	-48,50	2352,25
72,50	78,60	-6,10	37,21
72,50	39,50	33,00	1089,00
72,50	106,50	-34,00	1156,00
108,50	80,00	28,50	812,25
72,50	58,00	14,50	210,25
27,50	87,50	-60,00	3600,00
27,50	39,50	-12,00	144,00
108,50	119,00	-10,50	110,25
72,50	32,00	40,50	1640,25
72,50	39,50	33,00	1089,00
27,50	15,00	12,50	156,25
72,50	102,00	-29,50	870,25
27,50	90,50	-63,00	3969,00
72,50	46,00	26,50	702,25
72,50	32,00	40,50	1640,25
72,50	11,50	61,00	3721,00
108,50	109,50	-1,00	1,00
72,50	85,50	-13,00	169,00
72,50	58,00	14,50	210,25
27,50	35,00	-7,50	56,25
27,50	39,50	-12,00	144,00
27,50	101,00	-73,50	5402,25
27,50	53,50	-26,00	676,00
108,50	125,00	-16,50	272,25
27,50	82,00	-54,50	2970,25
72,50	24,50	48,00	2304,00
108,50	119,00	-10,50	110,25
108,50	90,50	18,00	324,00
27,50	23,00	4,50	20,25
72,50	62,00	10,50	110,25
27,50	78,60	-51,10	2611,21
72,50	73,00	-0,50	0,25
27,50	46,00	-18,50	342,25
72,50	46,00	26,50	702,25
27,50	113,50	-86,00	7396,00
108,50	121,50	-13,00	169,00
27,50	24,50	3,00	9,00
27,50	87,50	-60,00	3600,00
108,50	121,50	-13,00	169,00
108,50	124,00	15,50	240,25
72,50	94,50	-22,00	484,00

APPENDIX 4

TABLE 4.2.5.

RANK SCORE OF SUBSTANCE ABUSE AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE SQUARED DIFFERENCE AND SUM OF THE DIFFERENCE

RANK SUBSTANCE ABUSE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
27,50	39,50	-12,00	144,00
108,50	62,00	46,50	2162,25
72,50	104,50	-32,00	1024,00
27,50	28,50	-1,00	1,00
27,50	46,00	-18,50	342,25
72,50	46,00	26,50	702,25
27,50	28,50	-1,00	1,00
72,50	70,00	2,50	6,25
27,50	28,50	-1,00	1,00
108,50	21,00	87,50	7656,25
72,50	51,00	21,50	462,25
72,50	11,50	61,00	3721,00
27,50	5,00	22,50	506,25
108,50	108,00	0,50	0,25
27,50	85,50	-58,00	3364,00
27,50	15,00	12,50	156,25
72,50	5,00	67,50	4556,25
27,50	21,00	6,50	42,25
27,50	15,00	12,50	156,25
27,50	5,00	22,50	506,25
108,50	119,00	-10,50	110,25
27,50	89,00	-61,50	3782,25
72,50	92,00	-19,50	380,25
108,50	78,60	29,90	894,01
27,50	32,00	-4,50	20,25
27,50	80,00	-52,50	2756,25
27,50	51,00	-23,50	552,25
27,50	18,00	9,50	90,25
108,50	26,00	82,50	6806,25
27,50	21,00	6,50	42,25
27,50	97,50	-70,00	4900,00
27,50	78,60	-51,10	2611,21
27,50	11,50	16,00	256,00
72,50	104,50	-32,00	1024,00
27,50	58,00	-30,50	930,25
72,50	35,00	37,50	1406,25
27,50	39,50	-12,00	144,00
27,50	18,00	9,50	90,25

4.2.5 SUBSTANCE ABUSE AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 149667,4}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{898004,4}{2000250}$$

therefore $$r = 1 - 0,449$$

therefore $$r = 0,55$$

therefore $$r^2 = 0,30$$

RANK DIET	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
91,00	39,50	51,50	2652,25
91,00	121,50	-30,50	930,25
91,00	124,00	-33,00	1089,00
91,00	94,50	-3,50	12,25
36,00	96,00	-60,00	3600,00
36,00	55,50	-19,50	380,25
36,00	70,00	-34,00	1156,00
36,00	73,00	-37,00	1369,00
36,00	123,00	-87,00	7569,00
36,00	70,00	-34,00	1156,00
36,00	78,00	-42,00	1764,00
36,00	78,60	-42,60	1814,76
36,00	116,00	-80,00	6400,00
118,50	97,50	21,00	441,00
36,00	73,00	-37,00	1369,00
118,50	115,00	3,50	12,25
118,50	126,00	-7,50	56,25
118,50	109,50	9,00	81,00
118,50	111,50	7,00	49,00
36,00	46,00	-10,00	100,00
91,00	113,50	-22,50	506,25
91,00	93,00	-2,00	4,00
36,00	111,50	-75,50	5700,25
36,00	106,50	-70,50	4970,25
36,00	99,50	-63,50	4032,25
36,00	18,00	18,00	324,00
36,00	5,00	31,00	961,00
91,00	5,00	86,00	7396,00
36,00	5,00	31,00	961,00
36,00	11,50	24,50	600,25
36,00	5,00	31,00	961,00
36,00	55,50	-19,50	380,25
36,00	76,00	-40,00	1600,00
36,00	46,00	-10,00	100,00
36,00	76,00	-40,00	1600,00
36,00	60,00	-24,00	576,00
36,00	28,50	7,50	56,25
36,00	99,50	-63,50	4032,25
36,00	83,50	-47,50	2256,25
36,00	103,00	67,00	4489,00
36,00	5,00	31,00	961,00
36,00	51,00	-15,00	225,00
36,00	83,50	-47,50	2256,25
36,00	94,50	-58,50	3422,25
		TOTAL	243179,30

RANK DIET	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
91.00	39.50	51.50	2652.25
36.00	39.50	-3.50	12.25
36.00	18.00	18.00	324.00
91.00	62.00	29.00	841.00
36.00	35.00	1.00	1.00
118.50	80.00	38.50	1482.25
36.00	53.50	-17.50	306.25
118.50	117.00	1.50	2.25
91.00	5.00	86.00	7396.00
91.00	76.00	15.00	225.00
36.00	78.60	-42.60	1814.76
36.00	39.50	-3.50	12.25
36.00	106.50	-70.50	4970.25
91.00	80.00	11.00	121.00
118.50	58.00	60.50	3660.25
91.00	87.50	3.50	12.25
91.00	39.50	51.50	2652.25
91.00	119.00	-28.00	784.00
91.00	32.00	59.00	3481.00
36.00	39.50	-3.50	12.25
36.00	15.00	21.00	441.00
36.00	102.00	-66.00	4356.00
36.00	90.50	-54.50	2970.25
36.00	46.00	-10.00	100.00
91.00	32.00	59.00	3481.00
91.00	11.50	79.50	6320.25
118.50	109.50	9.00	81.00
36.00	85.50	-49.50	2450.25
36.00	58.00	-22.00	484.00
36.00	35.00	1.00	1.00
36.00	39.50	-3.50	12.25
91.00	101.00	-10.00	100.00
91.00	53.50	37.50	1406.25
36.00	125.00	-89.00	7921.00
91.00	82.00	9.00	81.00
91.00	24.50	66.50	4422.25
36.00	119.00	-83.00	6889.00
91.00	90.50	0.50	0.25
36.00	23.00	13.00	169.00
91.00	62.00	29.00	841.00
36.00	78.60	-42.60	1814.76
36.00	73.00	-37.00	1369.00
36.00	46.00	-10.00	100.00
91.00	46.00	45.00	2025.00
91.00	113.50	-22.50	506.25
118.50	121.50	-3.00	9.00
91.00	24.50	66.50	4422.25
91.00	87.50	3.50	12.25

APPENDIX 4

TABLE 4.2.4.

RANK SCORE OF DIET AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE, SQUARED DIFFERENCE AND SUM OF THE SQUARED DIFFERENCE

RANK DIET	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
91,00	39,50	51,50	2652,25
118,50	62,00	56,50	3192,25
118,50	104,50	14,00	196,00
118,50	28,50	90,00	8100,00
91,00	46,00	45,00	2025,00
91,00	46,00	45,00	2025,00
91,00	28,50	62,50	3906,25
91,00	70,00	21,00	441,00
91,00	28,50	62,50	3906,25
36,00	21,00	15,00	225,00
91,00	51,00	40,00	1600,00
36,00	11,50	24,50	600,25
36,00	5,00	31,00	961,00
36,00	108,00	-72,00	5184,00
36,00	85,50	-49,50	2450,25
36,00	15,00	21,00	441,00
36,00	5,00	31,00	961,00
36,00	21,00	15,00	225,00
36,00	15,00	21,00	441,00
36,00	5,00	31,00	961,00
91,00	119,00	-28,00	784,00
36,00	89,00	-53,00	2809,00
36,00	92,00	-56,00	3136,00
36,00	78,60	-42,60	1814,76
36,00	32,00	4,00	16,00
36,00	80,00	-44,00	1936,00
36,00	51,00	-15,00	225,00
36,00	18,00	18,00	324,00
91,00	26,00	65,00	4225,00
91,00	21,00	70,00	4900,00
118,50	97,50	21,00	441,00
36,00	78,60	-42,60	1814,76
91,00	11,50	79,50	6320,25
36,00	104,50	-68,50	4692,25
118,50	58,00	60,50	3660,25
118,50	35,00	83,50	6972,25

4.2.4 DIET AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 243179,3}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{1459075,8}{2000250}$$

therefore $r = 1 - 0,73$

therefore $r = 0,27$

therefore $r^2 = 0,073$

RANK AGE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
90.00	124.00	-34.00	1156.00
84.00	94.50	-10.50	110.25
76.00	96.00	-20.00	400.00
33.00	55.50	-22.50	506.25
58.00	70.00	-12.00	144.00
15.00	73.00	-58.00	3364.00
111.00	123.00	-12.00	144.00
12.00	70.00	-58.00	3364.00
79.00	78.00	1.00	1.00
25.00	78.60	-53.60	2872.96
47.00	116.00	-69.00	4761.00
67.00	97.50	-30.50	930.25
35.50	73.00	-37.50	1406.25
9.00	115.00	-106.00	11236.00
8.00	126.00	-118.00	13924.00
20.00	109.50	-89.50	8010.25
31.00	111.50	-80.50	6480.25
126.00	46.00	80.00	6400.00
37.00	113.50	-76.50	5852.25
64.00	93.00	-29.00	841.00
63.00	111.50	-48.50	2352.25
121.00	106.50	14.50	210.25
54.0'	99.50	-45.50	2070.25
30.00	18.00	12.00	144.00
73.00	5.00	68.00	4624.00
1.00	5.00	-4.00	16.00
101.50	5.00	96.50	9312.25
43.50	11.50	32.00	1024.00
75.00	5.00	70.00	4900.00
71.00	55.50	15.50	240.25
117.00	76.00	41.00	1681.00
106.00	46.00	60.00	3300.00
97.00	76.00	21.00	441.00
34.00	60.00	-26.00	676.00
23.00	28.50	-5.50	30.25
49.00	99.50	-50.50	2550.25
114.00	83.50	30.50	930.25
93.00	103.00	-10.00	100.00
115.00	5.00	110.00	12100.00
116.00	51.00	65.00	4225.00
65.00	83.50	-18.50	342.26
70.00	94.50	-24.50	600.25
		TOTAL	339002.80

RANK AGE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
107.00	39.50	67.50	4556.25
52.50	18.00	34.50	1190.25
38.00	62.00	-24.00	576.00
80.00	35.00	45.00	2025.00
122.00	80.00	42.00	1764.00
126.00	53.50	72.50	5256.25
43.50	117.00	-73.50	5402.25
68.00	5.00	63.00	3969.00
103.00	76.00	27.00	729.00
53.00	78.60	-25.60	655.36
109.00	39.50	69.50	4830.25
42.00	106.50	-64.50	4160.25
86.00	80.00	6.00	36.00
56.00	58.00	-2.00	4.00
29.00	87.50	-58.50	3422.25
33.00	39.50	-6.50	42.25
28.00	119.00	-91.00	8281.00
40.00	32.00	8.00	64.00
108.00	39.50	68.50	4692.25
52.50	15.00	37.50	1406.25
123.00	102.00	21.00	441.00
82.00	90.50	-8.50	72.25
57.00	46.00	11.00	121.00
89.00	32.00	57.00	3249.00
95.00	11.50	83.50	6972.25
62.00	109.50	-47.50	2256.25
88.00	85.50	2.50	6.25
72.00	58.00	14.00	196.00
61.00	35.00	26.00	676.00
112.00	39.50	72.50	5256.25
66.00	101.00	-35.00	1225.00
94.00	53.50	40.50	1640.25
43.50	125.00	-81.50	6642.25
74.00	82.00	-8.00	64.00
47.00	24.50	22.50	506.25
24.00	119.00	-95.00	9025.00
92.00	90.50	1.50	2.25
81.00	23.00	58.00	3364.00
78.00	62.00	16.00	256.00
51.00	78.60	-27.60	761.76
27.00	73.00	-46.00	2116.00
58.00	46.00	12.00	144.00
87.00	46.00	41.00	1681.00
35.50	113.50	-78.00	6084.00
119.00	121.50	-2.50	6.25
19.00	24.50	-5.50	30.25
96.00	87.50	8.50	72.25
26.00	121.50	-95.50	9120.25

APPENDIX 4

TABLE 4.2.3.

RANK SCORE OF AGE AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE, SQUARED DIFFERENCE AND SUM OF THE SQUARED DIFFERENCE.

RANK AGE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
3,50	39,50	-36,00	1296,00
22,00	62,00	-40,00	1600,00
7,00	104,50	-97,50	9506,25
41,00	28,50	12,50	156,25
13,00	46,00	-33,00	1089,00
101,50	46,00	55,50	3080,25
99,00	28,50	70,50	4970,25
120,00	70,00	50,00	2500,00
105,00	28,50	76,50	5852,25
21,00	21,00	0,00	0,00
101,50	51,00	50,50	2550,25
104,00	11,50	92,50	8556,25
10,00	5,00	5,00	25,00
85,00	108,00	-23,00	529,00
32,00	85,50	-53,50	2862,25
3,50	15,00	-11,50	132,25
5,00	5,00	0,00	0,00
14,00	21,00	-7,00	49,00
124,00	15,00	109,00	11881,00
18,00	5,00	13,00	169,00
91,00	119,00	-28,00	784,00
6,00	89,00	-83,00	6889,00
110,00	92,00	18,00	324,00
69,00	78,60	-9,60	92,16
16,00	32,00	-16,00	256,00
47,00	80,00	-33,00	1089,00
16,00	51,00	-35,00	1225,00
83,00	18,00	65,00	4225,00
118,00	26,00	92,00	8464,00
59,00	21,00	38,00	1444,00
113,00	97,50	15,50	240,25
77,00	78,60	-1,60	2,56
50,00	11,50	38,50	1482,25
2,00	104,50	-102,50	10506,25
11,00	58,00	-47,00	2209,00
97,00	35,00	62,00	3844,00

APPENDIX 5

TABLE 5.1.1.

AVERAGE DAYS ABSENT PER GRADE

GRADE	9	10	11	12	13	14	15	16	17	18	19
DAYS ABSENT	27.0	11.0	3.0	10.0	23.0	20.7	12.9	32.9	24.3	25.4	22.3

HISTOGRAM 5.1.2.

HISTOGRAM SHOWING THE AVERAGE DAYS ABSENT PER GRADE

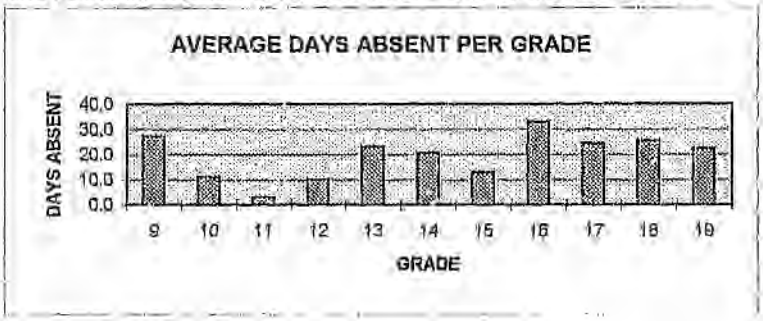


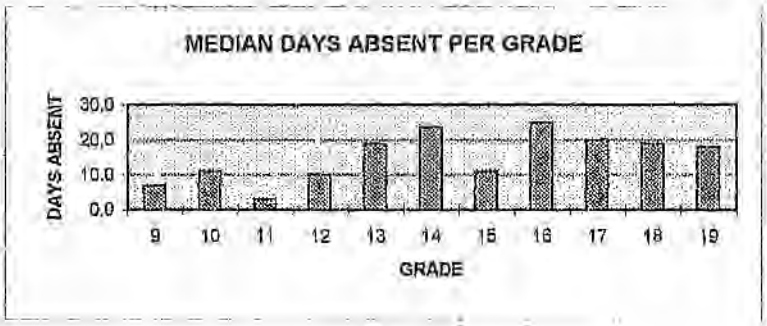
TABLE 5.1.1.

MEDIAN DAYS ABSENT PER GRADE

GRADE	9	10	11	12	13	14	15	16	17	18	19
DAYS ABSENT	7.0	11.0	3.0	10.0	19.0	23.5	11.0	25.0	20.0	19.0	18.0

HISTOGRAM 5.1.2.

HISTOGRAM SHOWING THE MEDIAN DAYS ABSENT PER GRADE



RANK STRESS MANAGEMENT	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
105.00	96.00	9.00	81.00
58.50	55.50	3.00	9.00
58.50	70.00	-11.50	132.25
58.50	73.00	-14.50	210.25
105.00	123.00	-18.00	324.00
105.00	70.00	35.00	1225.00
58.50	78.00	-19.50	380.25
105.00	78.60	26.40	696.96
58.50	116.00	-57.50	3306.25
105.00	97.50	7.50	56.25
17.00	73.00	-56.00	3136.00
58.50	115.00	-56.50	3192.25
105.00	126.00	-21.00	441.00
105.00	109.50	-4.50	20.25
105.00	111.50	-6.50	42.25
58.50	46.00	12.50	156.25
105.00	113.50	-8.50	72.25
105.00	93.00	12.00	144.00
105.00	111.50	-6.50	42.25
105.00	106.50	-1.50	2.25
58.50	99.50	-41.00	1681.00
58.50	18.00	40.50	1640.25
17.00	5.00	12.00	144.00
105.00	5.00	100.00	10000.00
58.50	5.00	53.50	2862.25
17.00	11.50	5.50	30.25
58.50	5.00	53.50	2862.25
58.50	55.50	3.00	9.00
58.50	76.00	-17.50	306.25
58.50	46.00	12.50	156.25
105.00	76.00	29.00	841.00
58.50	60.00	-1.50	2.25
105.00	28.50	76.50	5852.25
105.00	99.50	5.50	30.25
105.00	83.50	21.50	462.25
105.00	103.00	2.00	4.00
58.50	5.00	53.50	2862.25
105.00	51.00	54.00	2916.00
105.00	83.50	21.50	462.25
105.00	94.50	10.50	110.25
		TOTAL	174432.60

RANK STRESS MANAGEMENT	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
17.00	62.00	-45.00	2025.00
17.00	35.00	-18.00	324.00
58.50	80.00	-21.50	462.25
58.50	53.50	5.00	25.00
105.00	117.00	-12.00	144.00
58.50	5.00	53.50	2862.25
58.50	76.00	-17.50	306.25
17.00	78.60	-61.60	3794.56
58.50	39.50	19.00	361.00
105.00	106.50	-1.50	2.25
58.50	80.00	-21.50	462.25
105.00	58.00	47.00	2209.00
17.00	87.50	-70.50	4970.25
58.50	39.50	19.00	361.00
58.50	119.00	-60.50	3660.25
17.00	32.00	-15.00	225.00
58.50	39.50	19.00	361.00
58.50	15.00	43.50	1892.25
105.00	102.00	3.00	9.00
58.50	90.50	-32.00	1024.00
105.00	46.00	59.00	3481.00
17.00	32.00	-15.00	225.00
58.50	11.50	47.00	2209.00
105.00	109.50	-4.50	20.25
58.50	85.50	-27.00	729.00
58.50	58.00	0.50	0.25
58.50	35.00	23.50	552.25
105.00	39.50	65.50	4290.25
58.50	101.00	-42.50	1806.25
17.00	53.50	-36.50	1332.25
105.00	125.00	-20.00	400.00
58.50	82.00	-23.50	552.25
58.50	24.50	34.00	1156.00
58.50	119.00	-60.50	3660.25
58.50	90.50	-32.00	1024.00
58.50	23.00	35.50	1260.25
58.50	62.00	-3.50	12.25
17.00	78.60	-61.60	3794.56
58.50	73.00	-14.50	210.25
58.50	46.00	12.50	156.25
58.50	46.00	12.50	156.25
58.50	113.50	-55.00	3025.00
17.00	121.50	-104.50	10920.25
58.50	24.50	34.00	1156.00
105.00	87.50	17.50	306.25
105.00	121.50	-16.50	272.25
105.00	124.00	-19.00	361.00
58.50	94.50	-36.00	1296.00

APPENDIX 4

TABLE 4.2.8

RANK SCORE OF STRESS MANAGEMENT AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE SQUARED DIFFERENCE AND THE SUM OF THE SQUARED DIFFERENCE

RANK STRESS MANAGEMENT	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
17.00	39.50	-22.50	506.25
58.50	62.00	-3.50	12.25
105.00	104.50	0.50	0.25
17.00	28.50	-11.50	132.25
17.00	46.00	-29.00	841.00
58.50	46.00	12.50	156.25
17.00	28.50	-11.50	132.25
17.00	70.00	-53.00	2809.00
17.00	28.50	-11.50	132.25
17.00	21.00	-4.00	16.00
105.00	51.00	54.00	2916.00
58.50	11.50	47.00	2209.00
17.00	5.00	12.00	144.00
58.50	108.00	-49.50	2450.25
105.00	85.50	19.50	380.25
17.00	15.00	2.00	4.00
17.00	5.00	12.00	144.00
17.00	21.00	-4.00	16.00
17.00	15.00	2.00	4.00
17.00	5.00	12.00	144.00
105.00	119.00	-14.00	196.00
17.00	89.00	-72.00	5184.00
17.00	92.00	-75.00	5625.00
17.00	78.60	-61.60	3794.56
105.00	32.00	73.00	5329.00
17.00	80.00	-63.00	3969.00
17.00	51.00	-34.00	1156.00
58.50	18.00	40.50	1640.25
17.00	26.00	-9.00	81.00
17.00	21.00	-4.00	16.00
105.00	97.50	7.50	56.25
105.00	78.60	26.40	696.96
17.00	11 50	5.50	30.25
105.00	104.50	0.50	0.25
58.50	58.00	0.50	0.25
105.00	35.00	70.00	4900.00
105.00	39.50	65.50	4290.25
105.00	18.00	87.00	7569.00

4.2.8 POOR STRESS MANAGEMENT AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \text{ sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 174432,6}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{1046595,6}{2000250}$$

therefore $$r = 1 - 0,52$$

therefore $$r = 0,48$$

therefore $$r^2 = 0,23$$

RANK EXERCISE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
28.00	70.00	-42.00	1764.00
26.00	73.00	-47.00	2209.00
7.50	123.00	-115.50	13340.25
7.50	70.00	-62.50	3906.25
82.00	78.00	4.00	16.00
82.00	78.60	3.40	11.56
26.00	116.00	-90.00	8100.00
82.00	97.50	-15.50	240.25
82.00	73.00	9.00	81.00
26.00	115.00	-89.00	7921.00
82.00	126.00	-44.00	1936.00
82.00	109.50	-27.50	756.25
82.00	111.50	-29.50	870.25
82.00	46.00	36.00	1296.00
82.00	113.50	-31.50	992.25
82.00	93.00	-11.00	121.00
82.00	111.50	-29.50	870.25
82.00	106.50	-24.50	600.25
82.00	99.50	-17.50	306.25
26.00	18.00	8.00	64.00
82.00	5.00	77.00	5929.00
26.00	5.00	21.00	441.00
7.50	5.00	2.50	6.25
82.00	11.50	70.50	4970.25
82.00	5.00	77.00	5929.00
82.00	55.50	26.50	702.25
26.00	76.00	-50.00	2500.00
82.00	46.00	36.00	1296.00
7.50	76.00	-68.50	4692.25
26.00	60.00	-34.00	1156.00
82.00	28.50	53.50	2862.25
82.00	99.50	-17.50	306.25
82.00	83.50	-1.50	2.25
82.00	103.00	-21.00	441.00
7.50	5.00	2.50	6.25
82.00	51.00	31.00	961.00
82.00	83.50	-1.50	2.25
82.00	94.50	-12.50	156.25
		TOTAL	220309.05

RANK EXERCISE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d X d
82,00	80,00	2,00	4,00
82,00	53,50	28,50	812,25
82,00	117,00	-35,00	1225,00
82,00	5,00	77,00	5929,00
82,00	76,00	6,00	36,00
82,00	78,60	3,40	11,56
82,00	39,50	42,50	1806,25
82,00	106,50	-24,50	600,25
82,00	80,00	2,00	4,00
26,00	58,00	-32,00	1024,00
82,00	87,50	-5,50	30,25
82,00	39,50	42,50	1806,25
82,00	119,00	-37,00	1369,00
82,00	32,00	50,00	2500,00
82,00	39,50	42,50	1806,25
82,00	15,00	67,00	4489,00
82,00	102,00	-20,00	400,00
82,00	90,50	-8,50	72,25
82,00	46,00	36,00	1296,00
7,50	32,00	-24,50	600,25
82,00	11,50	70,50	4970,25
82,00	109,50	-27,50	756,25
82,00	85,50	-3,50	12,25
26,00	58,00	-32,00	1024,00
82,00	35,00	47,00	2209,00
7,50	39,50	-32,00	1024,00
82,00	101,00	-19,00	361,00
82,00	53,50	28,50	812,25
7,50	125,00	-117,50	13806,25
7,50	82,00	-74,50	5550,25
82,00	24,50	57,50	3306,25
82,00	119,00	-37,00	1369,00
82,00	90,50	-8,50	72,25
82,00	23,00	59,00	3481,00
82,00	62,00	20,00	400,00
82,00	78,60	3,40	11,56
82,00	73,00	9,00	81,00
26,00	46,00	-20,00	400,00
82,00	46,00	36,00	1296,00
82,00	113,50	-31,50	992,25
82,00	121,50	-39,50	1560,25
82,00	24,50	57,50	3306,25
82,00	87,50	-5,50	30,25
82,00	121,50	-39,50	1560,25
82,00	124,00	-42,00	1764,00
82,00	94,50	-12,50	156,25
82,00	96,00	-14,00	196,00
82,00	55,50	26,50	702,25

APPENDIX 4

TABLE 4.2.7.

RANK SCORE OF EXERCISE AND DAYS ABSENT PER RESPONDENT WITH DIFFERENCE ,SQU RED DIFFERENCE AND SUM OF SQUARED DIFFE NCE

RANK EXERCISE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
26,00	39,50	-13,50	182,25
82,00	62,00	20,00	400,00
82,00	104,50	-22,50	506,25
26,00	28,50	-2,50	6,25
26,00	46,00	-20,00	400,00
82,00	46,00	36,00	1296,00
82,00	28,50	53,50	2862,25
82,00	70,00	12,00	144,00
82,00	28,50	53,50	2862,25
82,00	21,00	61,00	3721,00
82,00	51,00	31,00	961,00
7,50	11,50	-4,00	16,00
82,00	5,00	77,00	5929,00
82,00	108,00	-26,00	676,00
26,00	85,50	-59,50	3540,25
26,00	15,00	11,00	121,00
7,50	5,00	2,50	6,25
7,50	21,00	-13,50	182,25
7,50	15,00	-7,50	56,25
26,00	5,00	21,00	441,00
82,00	119,00	-37,00	1369,00
26,00	89,00	-63,00	3969,00
26,00	92,00	-66,00	4356,00
82,00	78,60	3,40	11,56
82,00	32,00	50,00	2500,00
7,50	80,00	-72,50	5256,25
26,00	51,00	-25,00	625,00
82,00	18,00	64,00	4096,00
82,00	26,00	56,00	3136,00
26,00	21,00	5,00	25,00
82,00	97,50	-15,50	240,25
82,00	78,60	3,40	11,56
82,00	11,50	70,50	4970,25
82,00	104,50	-22,50	506,25
7,50	58,00	-50,50	2550,25
82,00	35,00	47,00	2209,00
82,00	39,50	42,50	1806,25
26,00	18,00	8,00	64,00
26,00	62,00	-36,00	1296,00
82,00	35,00	47,00	2209,00

4.2.7 EXERCISE AND DAYS ABSENT

From the table attached, the total of d^2 was established and substituted into the formula below:

n = number of respondents or terms therefore 126

$$r = 1 - \frac{6 \times \text{sum of } d^2}{n(n^2-1)}$$

therefore $$r = 1 - \frac{6 \times 220309,1}{126\ (126 \times 126-1)}$$

therefore $$r = 1 - \frac{1321854,6}{2000250}$$

therefore $$r = 1 - 0,66$$

therefore $$r = 0,34$$

therefore $$r^2 = 0,12$$

RANK CHRONIC DISEASE	RANK DAYS ABSENT	DIFFERENC d	SQUARED DIFFERENCE d x d
38,50	96,00	-57,50	3306,25
89,00	55,50	33,50	1122,25
114,00	70,00	44,00	1936,00
38,50	73,00	-34,50	1190,25
89,00	123,00	-34,00	1156,00
38,50	70,00	-31,50	992,25
38,50	78,00	-39,50	1560,25
38,50	78,60	-40,10	1608,01
38,50	116,00	-77,50	6006,25
114,00	97,50	16,50	272,25
38,50	73,00	-34,50	1190,25
38,50	115,00	-76,50	5852,25
89,00	126,00	-37,00	1369,00
114,00	109,50	4,50	20,25
114,00	111,50	2,50	6,25
89,00	46,00	43,00	1849,00
38,50	113,50	-75,00	5625,00
38,50	93,00	-54,50	2970,25
89,00	111,50	-22,50	506,25
38,50	106,50	-68,00	4624,00
114,00	99,50	14,50	210,25
89,00	18,00	71,00	5041,00
89,00	5,00	84,00	7056,00
38,50	5,00	33,50	1122,25
38,50	5,00	33,50	1122,25
38,50	11,50	27,00	729,00
114,00	5,00	109,00	11881,00
89,00	55,50	33,50	1122,25
38,50	76,00	-37,50	1406,25
114,00	46,00	68,00	4624,00
38,50	76,00	-37,50	1406,25
89,00	60,00	29,00	841,00
89,00	28,50	60,50	3660,25
114,00	99,50	14,50	210,25
38,50	83,50	-45,00	2025,00
114,00	103,00	11,00	121,00
114,00	5,00	109,00	11881,00
38,50	51,00	-12,50	156,25
114,00	83,50	30,50	930,25
114,00	94,50	19,50	380,25
		TOTAL	265347,30

RANK CHRONIC DISEASE	RANK DAYS ABSENT	DIFFERENC d	SQUARED DIFFERENCE d x d
114.00	62.00	52.00	2704.00
89.00	35.00	54.00	2916.00
114.00	80.00	34.00	1156.00
38.50	53.50	-15.00	225.00
38.50	117.00	-78.50	6162.25
38.50	5.00	33.50	1122.25
89.00	76.00	13.00	169.00
38.50	78.60	-40.10	1608.01
114.00	39.50	74.50	5550.25
38.50	106.50	-68.00	4624.00
38.50	80.00	-41.50	1722.25
89.00	58.00	31.00	961.00
114.00	87.50	26.50	702.25
38.50	39.50	-1.00	1.00
38.50	119.00	-80.50	6480.25
38.50	32.00	6.50	42.25
38.50	39.50	-1.0	1.00
38.50	15.00	23.50	552.25
38.50	102 00	-63.50	4032.25
89.00	90.50	-1.50	2.25
114.00	46.00	68.00	4624.00
89.00	32.00	57.00	3249.00
89.00	11.50	77.50	6006.25
38.50	109.50	-71.00	5041.00
89.00	85.50	3.50	12.25
38.50	58.00	-19.50	380.25
38.50	35.00	3.50	12.25
38.50	39.50	-1.00	1.00
38.50	101.00	-62.50	3906.25
89.00	53.50	35.50	1260.25
38.50	125.00	-86.50	7482.25
38.50	82.00	-43.50	1892.25
38.50	24.50	14.00	196.00
38.50	119.00	-80.50	6480.25
38.50	90.50	-52.00	2704.00
38.50	23.00	15.50	240.25
38.50	62.00	-23.50	552.25
38.50	78.60	-40.10	1608.01
38.50	73.00	-34.50	1190.25
38.50	46.00	-7.50	56.25
89.00	46.00	43.00	1849.00
89.00	113.50	-24.50	600.25
114.00	121.50	-7.50	56.25
38.50	24.50	14.00	196.00
38.50	87.50	-49.00	2401.00
38.50	121.50	-83.00	6889.00
38.50	124.00	-85.50	7310.25
89.00	94.50	-5.50	30.25

APPENDIX 4.

TABLE 4.2.6

RANK SCORE OF CHRONIC DISEASES AND DAYS ABSENT PER RESPONDENT WITH THE DIFFERENCE, SQUARED DIFFERENCE AND SUM OF THE SQUARED DIFFERENCE

RANK CHRONIC DISEASE	RANK DAYS ABSENT	DIFFERENCE d	SQUARED DIFFERENCE d x d
38.50	39.50	-1.00	1.00
38.50	62.00	-23.50	552.25
89.00	104.50	-15.50	240.25
38.50	28.50	10.00	100.00
38.50	46.00	-7.50	56.25
38.50	46.00	-7.50	56.25
114.00	28.50	85.50	7310.25
89.00	70.00	19.00	361.00
38.50	28.50	10.00	100.00
89.00	21.00	68.00	4624.00
38.50	51.00	-12.50	156.25
38.50	11.50	27.00	729.00
38.50	5.00	33.50	1122.25
38.50	108.00	-69.50	4830.25
38.50	85.50	-47.00	2209.00
38.50	15.00	23.50	552.25
38.50	5.00	33.50	1122.25
38.50	21.00	17.50	306.25
38.50	15.00	23.50	552.25
38.50	5.00	33.50	1122.25
114.00	119.00	-5.00	25.00
114.00	89.00	25.00	625.00
36.50	92.00	-53.50	2862.25
38.50	78.60	-40.10	1608.01
36.50	32.00	6.50	42.25
38.50	80.00	-41.50	1722.25
38.50	51.00	-12.50	156.25
89.00	18.00	71.00	5041.00
38.50	26.00	12.50	156.25
114.00	21.00	93.00	8649.00
114.00	97.50	16.50	272.25
38.50	78.60	-40.10	1608.01
38.50	11.50	27.00	729.00
114.00	104.50	9.50	90.25
38.50	58.00	-19.50	380.25
38.50	35.00	3.50	12.25
36.50	39.50	-1.00	1.00
114.00	18.00	96.00	9216.00

APPENDIX 5

TABLE 5.3.1.

AVERAGE DAYS ABSENT PER TOTAL LIFESTYLE SCORE

LIFESTYLE SCORE	0	1	2	3	4	5	6	7	8	9	10
DAYS ABSENT	3.0	3.8	17.2	12.3	17.1	24.4	26.9	37.5	44.3	62.5	48.5

HISTOGRAM 5.3.1.

HISTOGRAM SHOWING AVERAGE DAYS ABSENT PER TOTAL LIFESTYLE SCORE

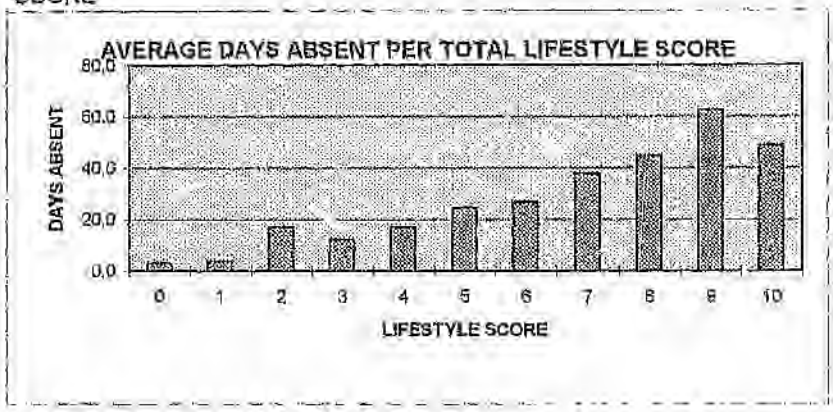


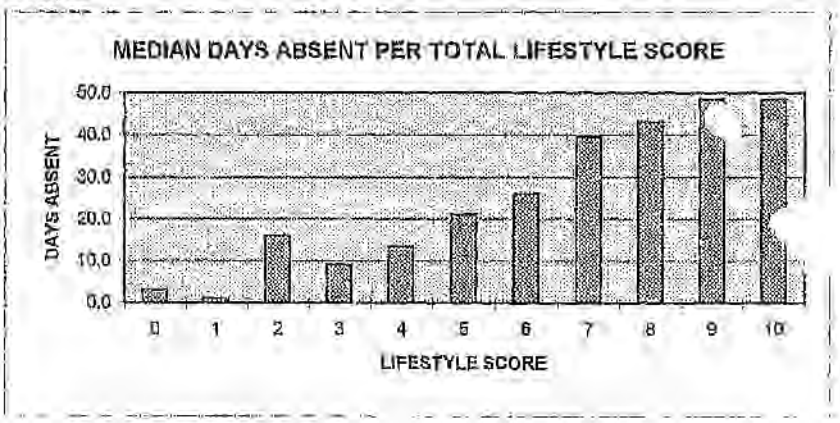
TABLE 5.3.2.

MEDIAN DAYS ABSENT PER TOTAL LIFESTYLE SCORE

LIFESTYLE SCORE	0	1	2	3	4	5	6	7	8	9	10
DAYS ABSENT	3.0	1.0	16.0	9.0	13.5	21.0	26.0	39.5	43.0	48.5	48.5

HISTOGRAM 5.3.2.

HISTOGRAM SHOWING MEDIAN DAYS ABSENT PER TOTAL LIFESTYLE SCORE



APPENDIX 5

TABLE 5.2.1

AVERAGE DAYS ABSENT PER AGE CATEGORY

20 TO 29	30 TO 39	40 TO 49	50 TO 59	60 TO 69
21.7	26.8	25.3	16.3	28.0

HISTOGRAM 5.2.1.

HISTOGRAM SHOWING AVERAGE DAYS ABSENT PER AGE CATEGORY

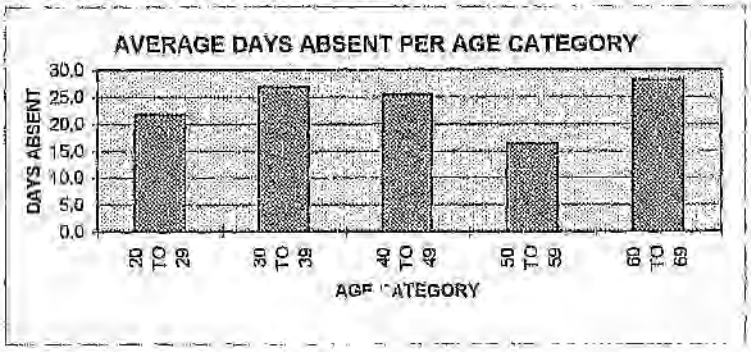


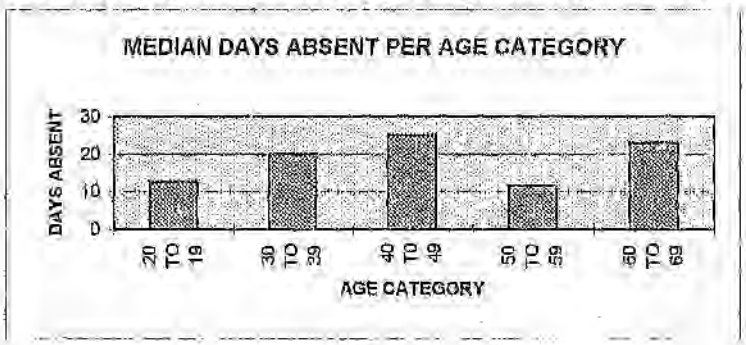
TABLE 5.2.2.

MEDIAN DAYS ABSENT PER AGE CATEGORY

20 TO 19	30 TO 39	40 TO 49	50 TO 59	60 TO 69
13	20	25	12	23

HISTOGRAM 5.2.2.

HISTOGRAM SHOWING MEDIAN DAYS ABSENT PER AGE CATEGORY



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