CHAPTER 3

Methodology

3.1 Introduction

This chapter provides a description of the research methodology adopted to investigate employee health. It is an interpretive study into the social reality of employee health for workers at every level of a university in Australia. As applied research it seeks to discover the needs of the employee group in relation to health and will develop recommendations based on those needs. This type of investigation of a social problem within its real life context is the first part of the needs assessment of the model of health promotion evaluation of Green and Kreuter (1991:22–31).

The case study approach of Yin (1989) is chosen as the most appropriate research design to fulfill the research aims for the following reasons:

1. the research aims are broad and suit 'a more rounded, holistic study' (Hakim 2000:59). Hakim states that the case study design is potentially more rounded and holistic than other designs because of the variety of methods that are possible to incorporate into it.

2. the case study for employee health is also appropriate because it has a dual character of investigating a social problem in its context. Harper (1992:139) describes the contextual aspect of case studies as offering benefits of both 'situational groundedness and theoretical generality'. The case study approach allows the contemporary phenomenon of employee health to be examined in its 'natural' context, which is the workplace.

3. Winefield and his team (2002) indicated that employees in the tertiary education industry have health problems to a greater extent than occurs in the Australian population. Further understanding of the phenomenon of employee health is gained by detailed analysis of the health status and factors influencing the health of employees in one workplace.

The schema of the methodology in Figure 1 shows the major sections of this chapter:

- the nature of the study, the case study research design, its problems and means to overcome them, and the ethical process for the conduct of the research
- the pilot study and its influence on the research project
- separate discussions of the quantitative and qualitative components in relation to:
    i. methods
    ii. sampling

iii. data collection

iv. analysis

v. results

vi. evalutation criteria for each component

- evaluation criteria for the case study as a whole, and evaluation criteria for applied research

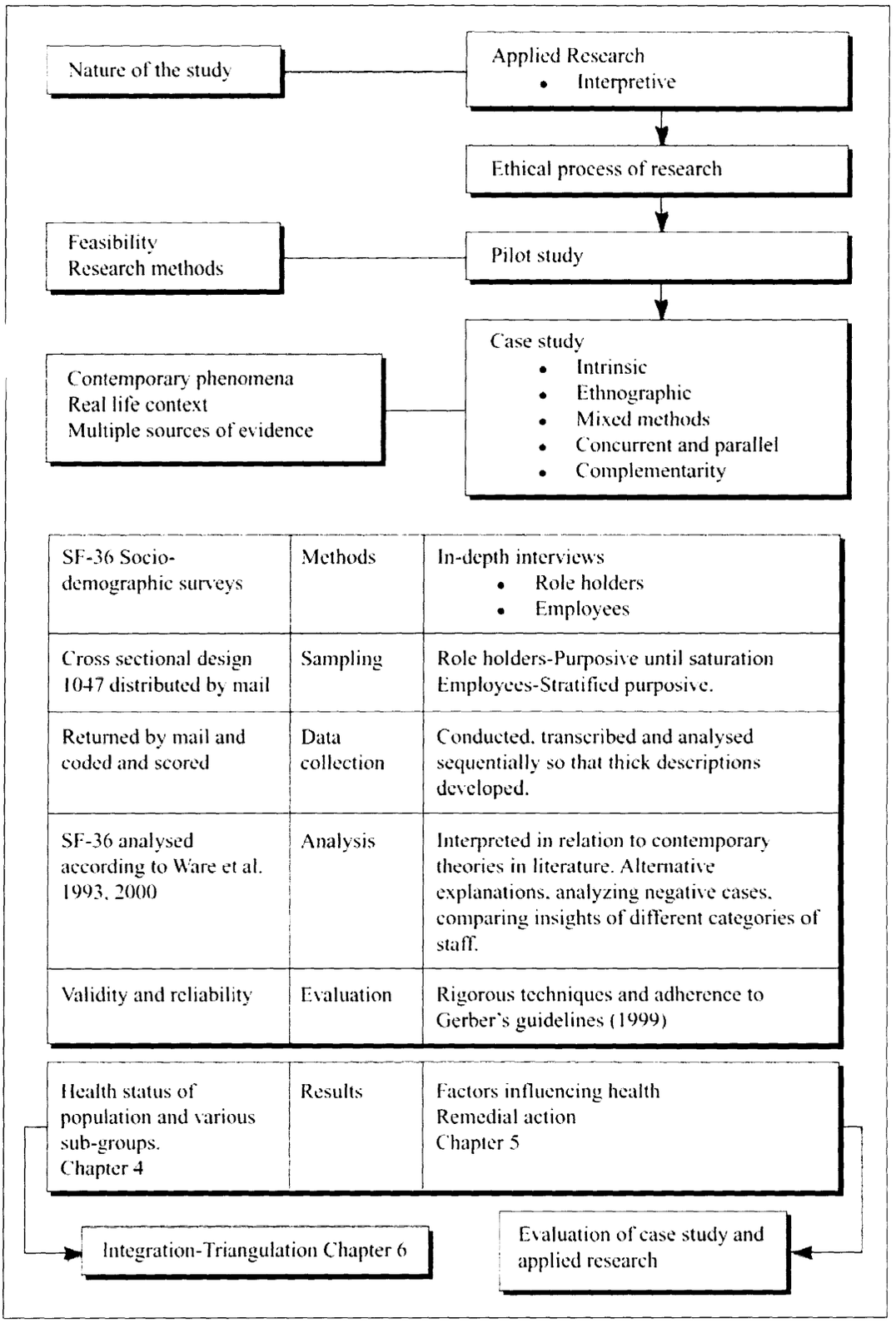


Figure 3-1: Schema of the methodology

3.2. Description of the nature of the study

The study is interpretative because it seeks to understand the subjective meanings of employee health from the point of view of employees. The interpretive nature of this research incorporates perspectives of three authors who write about the features of such investigations:

1. Schwandt (2000:193) regards studies as interpretative when the subjective meaning of informants is sought in a methodological objective manner. This study seeks the opinions of employees within the framework of structured research, which according to Grbich (1999:26) requires data collection and analysis contained within some identified theoretical tradition.

2. Minichiello et al. (1990:62), accentuates understanding people's experience 'in their own terms' rather than as 'members of a larger group or class'. The detailed study of individuals in one workplace will provide insights about psychosocial factors that are not accessible by studying aggregate data.

3. Denzin's (1989:10) emphasises the emotional impact of interpretive studies on the reader by 'capturing the voices, emotions and actions' of the informants. This study will make employee health 'more directly accessible to the reader' through the narratives of employees.

3.3 Description of the case study research design

This investigation fulfills the criteria that Yin (1989:23) describes in his definition of a case study, which is 'an empirical enquiry that:

- investigates a contemporary phenomenon within its real life context; when
- the boundaries between the phenomena and the context are not clearly evident; and in which
- multiple sources of evidence are used'.

In considering the first of Yin's criteria, this research aims to understand the complex reality of employee health within the real life context of the workplace rather than simply recording the number of incidences of various health events in the workplace. The real life context of the workplace means that employees experiencing all dimensions of employee health will be accessed by this approach. Employees with work-related health problems and those experiencing good or positive health and well being are accessed. Also, studying employees within their workplace is consistent with the intent of the occupational health and safety legislation which places obligations on the workplace to manage employee health so that harm is not done to employees (Occupational Health and Safety Act (NSW) 2001).

Yin's second criterion relates to the blurred boundaries between the phenomenon and the context. The boundaries between employee health and the workplace are blurred because employee health refers to the individual experiencing some health event that is often attributed to the workplace and the allocation of blame and/or responsibility and/or costs associated have always been contentious. Also, the boundaries are blurred because the

workplace consists of employees in different grades and types of employment and the literature suggests that these differences influence employee health experiences.

Yin's third criterion for a case study refers to the use of multiple sources of evidence in the process of the empirical enquiry. In this research project two sources of evidence are used to answer the research questions. The health status of the employees is assessed using quantitative methods and the insights of employees about their health are assessed using qualitative methods. Also, two types of employees, role holders and employees with limited authority are interviewed. Although the research project does not use multiple sources of evidence, the different methods that are used and different staff categories, academic and general, and different levels of employees, are consistent with the intent of this criterion.

3.4 Description of the type of case study

This research project is an instrumental case study (Stake 1994:88) because the case is of secondary importance — it plays a supportive role, facilitating understanding of something else that is embedded within it, that is, employee health. However the choice of the case is made because it is expected to advance understanding of that issue of interest. Yin (1989:31) refers to the issue of interest that is embedded within the case as the 'unit of analysis'. The unit of analysis in this instrumental case study is employee health. The workplace that provides the setting for this research is one out of the approximately 38 universities in the tertiary education industry in the Australian system.

3.4.1 Problems in the case study approach and means to overcome them

The faults inherent in the case study approach according to Hamel, Dufour and Fortin (1993:23) are the 'lack of representativeness' of the case for the phenomenon under investigation and the 'lack of rigor' in the research process that sometimes occurs in case studies. Yin (1989:21) recognises these limitations of the case study approach and suggests ways of overcoming them. The research process for the case study has five vulnerable points where theoretical justifications are required and the research process needs to be carefully followed to overcome difficulties inherent in the case study approach. These five vulnerable points (Yin 1989:29, 1993:4) are:

1. selection of the case
2. specification of the object of study within the case
3. the link between the data and the research questions
4. complete description of collection and analysis in descriptive case studies
5. criteria for interpreting the findings.

The strategies used in this project to address these problems are described below:

1. Selection of the case. This research is conducted by an internal researcher and the information is unsolicited by the organisation and therefore, the specific workplace is selected because the researcher has access to it. In addition, the researcher is not aware of anything within the workplace selected that would render the workplace as not typical of workplaces for the system as a whole, for example, there is no known OHS problem under investigation by WorkCover as of July 2004, and there has been

no life threatening OHS incident in the last four years and the organisation is functioning normally according to open discussions in the Vice Chancellor's Open Forum between management and staff on 16th June 2004.

2. Specification of the object of study within the case. The complex concept of employee health involves the following aspects: health status and its measurement; causative factors in employee health; and preventative and promotional strategies in employee health.
3. The link between the data and the research questions. A quantitative health status assessment instrument provides data to answer the first research question. Qualitative in-depth interviews with academic and general staff and all levels of staff provide data which addresses the second and third research questions.
4. Complete description of collection and analysis in descriptive case studies. The rigor involved in the data collection and analysis provides transparency in the research process. The analysis of the data occurs at two levels: personal health experience of employees; and culturally and socially determined health of employees in the workplace.
5. Criteria for interpreting the findings: This study relies on the theories developed about the social determinants of employee health. The patterns in the data are related to the theories about work and health that are substantiated in the literature. The three common theories which are discussed previously are: Demand-Control-Support Model developed by Karasek (Karasek 1979; Karasek & Theorell 1990); Person-Environment Fit Model developed by Caplan (Edwards, Caplan & Van Harrison 1998); and the Effort-Reward Model developed by Siegrist (1998).

3.4.2 Ethical process for the conduct of the research project

This research project is conducted according to the guidelines for Human Research at the University of New England. The researcher sought and gained approval for all components of the case study: the focus groups and individual interviews in the pilot study; the survey; and individual interviews in the research project. All the participants were given information sheets about the component of the research applicable to them and each signed a consent form to participate and to be audio tape-recorded when interviewed. The interviews were conducted privately and the tapes were transcribed by the researcher. Each focus group and interview lasted approximately one hour. Electronic files of the transcripts were coded and stored securely. The Human Research Ethics Committee's approval numbers for these components and copies of the information sheets and consent forms are provided in Appendix 1 for the pilot study and in Appendix 2 for the research project.

3.4.3 Preliminary research project

The research project was initially envisioned as an interpretative study using only qualitative methods. However, the researcher was concerned firstly, that doing justice to the complexity of the problem might prove difficult with a single method, and secondly about the cooperation of informations about personal health matters. For these two reasons a pilot study using only qualitative methods was conducted.

3.5 Description of the pilot study and its influence on the research project

The pilot study was conducted between August 2001 and March 2002 with the aims of: 1) determining the feasibility of conducting the research project; 2) deciding the most appropriate research methods for the research project; and 3) developing skills necessary to conduct the research project. The pilot study was restricted to staff below line manager in order to assist free discussion in the focus groups. The aims of the pilot study were successfully achieved by critical reflection on the outcomes of the pilot study and developing the skills of reflective practitioner suggested by Boud, Keogh & Walker (1985); Kolb (1984); Mulligan & Griffin (1992). The pilot study demonstrated that the research project was possible to do in the real world context of the workplace. Problems of access, participant's cooperation and the internal researcher were overcome. The cooperation from management indicated that the internal researcher would be able to conduct the research process in the workplace, and the rich and detailed quality of the data obtained showed that the participants were not constrained either.

The pilot study influenced the choice of methods used in the research project. The shortcomings of focus groups, for example, individuals tended to follow group consensus; the personal nature of health issues limited the inquiries from the researcher; and fear of public disclosure of private matters for groups that have on-going social relations with each other compromised the findings, suggested that individual interviewing might be more appropriate means to access employees' opinions.

The pilot study also showed that research design for the definitive project would be improved by accessing the health status of the employee population using some standard quantitative measure as well as qualitative methods. The informants' personal experiences of health (from the qualitative data) would benefit from being analysed in light of the health status of the population to which they belong (from the quantitative data), and this is accomplished by combining both methods in the case study approach. In the definitive study all levels of staff would be involved.

3.6 Research methods used in the case study

Quantitative and qualitative approaches are used in this study to answer different research questions by collecting and analyzing corresponding data. Lincoln and Guba, writing about mixed methodologies, state that mixed methodologies make 'perfectly good sense' (2000:169), especially when the issues and concerns of participants, elucidated through qualitative means, can be complemented by information that can be generated by quantitative methods (1994:105–117) and multiple techniques increase the probability that findings of the inquiry are trustworthy (1985:268–290).

This research is a concurrent and parallel mixed design, as the inferences (i.e. the end result of interpretations of findings (Teddlie & Tashakkori 2003:35)) from the quantitative approach do not determine the questions or procedures of the qualitative approach. The two different types of data, methods of analysis and both types of inferences from each strand of the mixed method study are pulled together to reach a 'meta-inference' (Tashakkori & Teddlie 2003:685–692).

Mixed methods are appropriate for these research questions and they yield greater information than can be achieved through reliance on single methods alone (Currall & Towler 2003:520) and are applicable, according to Forthofer (2003:527–528) to studying individual behaviour and lifestyle factors, social determinants of health, the consumer perspective of health and translating findings into practice. Gendron (2001:108–116) refers to three perspectives about the alliance of quantitative and qualitative methods: the incommensurability of quantitative and qualitative data which means elements considered to be different are measured differently; there are more similarities than differences in the two methods and that the combined information provides greater validity to the conclusions; and the complementarity perspective suggests that quantitative and qualitative data are widely different and present contradictory points of view, but paradoxically this can be complementary in researching complex phenomena. The complementarity perspective is the approach taken in this thesis as it can integrate concepts in the multi-disciplinarian area under investigation.

A significant difference between the quantitative and qualitative data is that the quantitative data measures health status at one point in time and reflects health experiences over the recent past. In contrast, the qualitative data is not restricted to this time scale. Therefore, in the qualitative data, past health experiences are discussed as well as present health and anticipated health behaviour. These differences, rather than being inconsistencies, add opportunities for deeper insight about employee health especially

when, according to Patton (1999a:1191–1197), the methods and data are kept in context and that the data is scanned for supporting evidence of alternative explanations.

Some of the disadvantages of mixed methods are cost, time and complexity, the latter of which requires integration and synthesis of the results across methodologies. In this thesis the advantages of mixed methods in providing multiple perspectives of employee health in the context of work outweigh the disadvantages. The purpose of applied research in the area of health and work is to transform practices through the production of knowledge (through quantitative approach) and the change in the world view of the phenomenon under consideration (through qualitative approach).

3.7 Quantitative component

There are two instruments used as quantitative methods in this study:

1. A short socio-demographic questionnaire prepared by the researcher ad hoc for this study (See Appendix 4)
2. A health related quality of life assessment tool, the Short Form (SF–36) self administered survey (Ware et al. 1993, 2000). The SF–36 is administered under license from QualityMetrics Incorporated (License Number F-061102-04. See appendix 3 for the authorised Australian version of SF–36).

3.7.1 Socio-demographic and work experience survey

A short questionnaire was developed to accompany the SF–36 survey, to help describe the sample and also because socio-demographic factors affect a person's ability to

function in everyday life (Koukouli, Vlachoniklois & Philalithis 2002:20). This section covered three areas which are: demographic, health service utilisation and risk behaviour. The categories of variables within these three areas are:

1. demographic information
   - age
   - sex
   - living arrangements
   - duration of employment
   - grade of employment
2. health service utilisation information
   - health insurance
   - medical consultations
   - alternative therapy consultations
   - hospitalisations
3. risk behaviour
   - smoking
   - drinking

3.7.1.1 Demographic categories

The definitions of these variables in the socio-demographic data are:

- Age is chronologically recorded and grouped into four categories: (1) younger than 35 years; (2) 35–44 years; (3) 45–54 years; (4) 55 years and older. These categories were based on previous knowledge about late age of entry for employees into the tertiary education industry for example, the long training period required to obtain doctoral degrees which are required for tenured academic positions. In addition, statistics on the Australian Labour Force (ABS 2002) regard employees of 45years and over as mature age employees.

- Living arrangements are categoried into two groups: (1) those employees 'living in partnerships' which included married and defacto relationships; and (2) those

employees 'living alone', which is a composite and practical term to describe widowed, divorced, separated and single persons. Additionally, this latter group also included those employees who live separately from their partners in order to be near their place of employment. Living alone is a socio-demographic variable recognised in the New South Wales health promotion survey (Comino & Howell 2002: 15–19) as being associated with lower health outcomes.

Employment categories

The employment data provides information on: the *type of employment, grade of employment* within these two employment types; and *length of employment.*

- *Types of employment* was coded as: (1) academic staff; and (2) general staff.
- *Grades of employment* differ for the two different types of staff in the workplace, relating to the skills required for the employee's level of responsibility. For academic staff the grades of employment consist of six categories: entry level A (Associate Lecturer); B (Lecturer); C (Senior Lecturer); D (Associate Professor); to E (Professor); and Senior Executive positions, such as Pro Vice Chancellor Academic, and Pro Vice Chancellor Research. However, Grade of employment does not give any information about the conditions of employment, that is whether permanent, casual, full-time, part-time, or contract employment.

  For general staff, *grades of employment* are categorised in the survey into six groups, from the entry level of Higher Education Officer (HEO) 1 to HEO 10

and above. These groupings are: HEO 1 and 2; HEO 3 and 4; HEO 5 and 6; HEO 7; HEO 8 and 9; HEO 10 and above 10.

- *Length of employment* is divided into six possible periods: (1) less than one year; (2) 1–3 years; (3) 4–10 years; (4) 11–15 years; (5) 16–20 years; and (6) more that 20 years. The rationale for these employment time period groupings is that they corresponded to significant employee entitlements. For example, after three years service, academics may apply for six months paid study leave, and after ten years both academic and general staff are entitled to thirteen weeks long service leave.

3.7.1.3 Health insurance and service utilisation categories

The health insurance information from the demographic survey consists of the number of employees who pay for health insurance additional to the Australian compulsory Medicare levy and the type of that insurance. (Medicare is Australia's tax-funded universal health insurance program which provides: (1) access to medical services on an ambulatory basis for which a co-payment to the medical practioner may apply; and (2) access to free public hospital care on the basis of clinical need Rankin and Courtney 2004:124.) The categories are: 'none', that is, no additional insurance; 'partial', employees who pay for basic hospital insurance additional to the Medicare levy; and 'full', employees who pay for hospital and ancillary insurance additional to the Medicare levy.

The health service utilisation information consists of: the number of hospitalisations in the last twelve months; number of medical consultations in the last twelve months

(The definition of medical consultations in the survey is: consultations with a doctor/medical practitioner); and number of consultations with alternative therapists in the last twelve months (An alternative therapist is defined in the survey as a 'counsellor, chiropractor, physiotherapist, herbal therapist, osteopath, etc').

3.7.1.4 Risk behaviour

Risk behaviours were explored by asking participants about smoking and drinking habits. Smoking was ititially grouped into five categories: (1) never smoked; (2) stopped smoking; (3) in the process of stopping; (4) thinking of stopping; and (5) cannot stop. The National Drug Strategy Household Survey (AIHW 2001) refers to these two categories of Never smoked/Ex smokers and Current smokers to identify groups whose current smoking behaviour is harming their health. Therefore the responses to survey in these categories were regrouped as risks to health and coded in the categories of:

- 'No' which refers to Never smoked and Ex smokers that is (1) and (2) above.
- 'Yes' (3-5), which refers to those who Currently smoke regardless of the number of cigarettes smoked that is (3), (4) and (5) above.

Information on alcohol intake from the survey is categorised into five groups. These groups are: (1) do not drink at all; (2) one drink occasionally; (3) one drink once or twice a week; (4) one drink most days of the week; and (5) more than one drink every day. In light of the guidelines from The National Health and Medical Research

Council, quoted in the Australian Bureau of Statistics report on *Health, Health Risk Factors, Alcohol, Harmful Use of Alcohol* (2002) the responses were then recoded as:

- none or low alcohol consumption that is (1), (2) and (3) above which was considered as one drink once or twice a week
- moderate consumption, that is (4) above which was one drink most days of the week
- high risk, that is (5) above for both the short-term and long-term health problems from alcohol consumption because there were no alcohol free days in the week in their drinking pattern.

3.7.2 Quality of life/health status

The SF–36 was first developed out of the Medical Outcomes Study in the United States by Ware and his colleagues in the ealy 1990's when they were attempting to develop a practical tool to monitor patient outcomes in relation to differences in systems of health care, provider training and styles of practice (Ware, Snow & Kosinski 1993, 2000:xiv). The SF–36 is a generic, subjective and widely used health profile that measures health related quality of life (Patrick & Erickson 1993:124). It has been adopted internationally as a reliable and valid measure of quality of life (Gandek & Ware 1998).

In 1991, the International Quality of Life Assessment (IQOLA) Project was launched with the goal of translating, validating, and norming the SF–36 Health Survey. The validity and reliability of the SF–36 in patient populations has been confirmed in studies in United States (McHorney, Ware & Raczek 1993) and Britain (Garrat et al. 1993;

Jenkinson et al. 1999) and other parts of the world (Thumbo et al. 2002; Wagner et al. 1998). The SF–36 has been discussed in Bowling's *Measuring Health* (1997:57–63).

In Australia, the SF–36 has been used in the Coordinated Care Trials in South Australia (Richards, Kalucy & Esterman 1999) and the Australian Longitudinal Study on Women (Schofield & Mishra 1998).The South Australian population norms for the SF–36 health status questionnaire have been published by the South Australian Health Commission (Behavioural Epidemiology Unit 1995).

In measuring validity, the SF–36 has been compared to other widely used survey tests. SF–36 contains eight of the most frequently represented health concepts except sexual functioning (1993, 2000:8:3) and sleep (Hunt & Mckenna 1993:125). Using factor analytical tests for construct validity (i.e. evidence for the conceptualisation of health underlying the SF–36) Ware et al. (1993, 2000:9:20) find that some scales of the SF–36 (PF, RP, and BP) measure the physical dimension of health whereas others (MH, RE, and SF) measure the mental dimensions of health.

Reliability refers to the extent to which measures give consistent and accurate results (Sims & Wright 2000:131). Estimates for score reliability for the SF–36 have been reported in fourteen studies that have been reviewed by Ware et al. (1993, 2000:7:5) and they found that all estimates exceeded accepted standards for measures in group comparisons. The SF–36 has been found to be a reliable tool to investigate physical and psychological problems in relatively healthy populations (Hemingway et al. 1997;

Roberts, Hemingway & Marmot 1997; Shumeli 1999; Ware et al. 1993, 2000:11:1–11:3). The SF–36 has been used in the work environment (e.g. in the Whitehall II study) to measure health status. Furthermore, researchers in Australia (Schofield & Mishra 1998) have also concluded that the SF-36 is a reliable and sensitive tool to detect changes in health status over time thus allowing future comparisons and for evaluation purposes.

SF–36 was chosen as a measurement of health status in this study because:

- it is widely known and accepted as a valid and reliable tool in the literature of health and work and according to Stevenson (1996:130) is 'rapidly becoming the de facto standard for measurement of health status by interview or survey questionnaire'
- Australian population norms are available and comparisons of results with these norms are possible. For comparative purposes, the Australian Bureau of Statistics collected data on the SF–36 in the *National Health Survey* from approximately 18,000 people during 1995. Consequently from this survey, the Australian norms for SF–36 have been published for a wide range of population sub-groups, including an employed person's sub-group. The SF–36 health status profile of scores from this study is compared to these Australian population norms.
- comparison with other Australian and international studies can be made, for example the SF–36 was used in the Whitehall II studies
- tracing the health status of the target population over time can be performed and interventions can be evaluated
- its ease of use and analysis by a sole researcher.

3.7.2.1 Description of SF–36

The SF–36 includes one multi-item scale measuring eight health concepts. There are thirty-six questions in the survey and they measure eight dimensions of health. These dimensions and their abbreviations are indicated in the list below:

- Physical Functioning (PF): Limitations in physical health because of health problems
- Role Physical (RP): Limitations in usual role activities because of physical health problems
- Bodily Pain (BP)
- General Health (GH): General health perception
- Vitality (VT): Energy and fatigue
- Social Functioning (SF): Limitations in social activities due to physical or emotional problems
- Role Emotional (RE): Limitations in usual role activities because of emotional problems
- Mental Health (MH): Psychological distress and well being.

The responses to the questions in each scale are summarised to provide eight scores between 0 and 100, with higher scores indicating better health. Appendix 5 contains context based descriptions of the lowest and highest scale scores for the eight health dimensions. Scales in which health status is defined as the absence of incapacity had the highest possible score of 100 and the results are skewed towards higher scores. This

applies to Physical Functioning (PF), Role limitation-Physical (RP), Bodily Pain (BP), Social Functioning (SF), and Role limitation-Emotional (RE). The remaining three scales are bipolar and measure a wider range of negative and positive health states. These scales are General Health (GH), Vitality (VT), and Mental Health (MH). For these three dimensions a score in the mid range indicates that a person has reported no limitations or disabilities. These frequency distributions resemble a normal distribution more closely.

The SF–36 provides two summary scores. These summary measures correspond to the physical and mental dimensions of health status, that is, Physical Component Summary Scores (PCS) and Mental Component Summary Scores (MCS). These summary scores have been validated for differentiating populations with varying physical and mental health (McHorney et al. 1993; Ware & Kosinski 2001b). Ware and Kosinski (2001b:57–87) find that the PCS and MCS scores return to the midpoint of 50 with successful treatment — populations with clinical physical illnesses have scores lower than 50 and with treatment and recovery the PCS return to higher levels. Similarly, in populations with depression the MCS scores are lower than 50 and there is a rebound of the score with recovery from the depression.

There are two main weakness of the SF–36: (1) the misunderstanding of the terminology; and (2) misinterpreting of the questions (Richards, Kalucy & Esterman 1999). Mallinson (2002) conducted qualitative assessments of respondents' answers to the SF–36 and found that some respondent's personal conceptualisation of health meant that sometimes they included and excluded problems in different and unexpected ways. Also measures of

functioning ability often included self-care (bathing and eating) and mobility because they are socially relevant and interpretable, but in the general population, self-care limitations are rare — less than half of one per cent of the population report limitations in eating, dressing, bathing or using the toilet due to poor health (Bowling 1997:17). In spite of these weaknesses the SF–36 is still considered the most useful test of health status for the working population because of the availability of the employee person's population norms in Australia and consequently comparisons can be made, and in the future health intervention strategies can be evaluated.

3.8 Population and sampling

The population under study is the employees, that is, academic and general staff in the tertiary education industry in Australia. As a first step to study this population, and for reasons of convenience, all the employees in one regional university were selected. At the time of the study there were approximately 1100 employees in the selected sample. The employees are made up of approximately 450 academic staff and 650 general staff. The university, where these employees work, is situated in a well-resourced city with health services and a regional base public hospital.

Different sampling strategies for the quantitative and qualitative component of this research project are discussed in the following relevant sections.

3.9. Survey sampling process

Using a cross sectional design the quantitative data collection instruments were sent to all staff of the organisation (i.e. n=1047) that were employed by the university at the time of the survey. These forms were coded and sent together in a personally addressed envelope to each member in the workplace, via the internal mail service. Accompanying the survey was a letter of introduction from the Head of the School of Health, and an Information Sheet for Participants, and a return envelope addressed to the researcher. No consent form was necessary as return of the completed survey was considered as an indication of consent. Of the 1047 surveys distributed, 407 were sent to academic staff and 640 were sent to general staff. A response rate of 40% was expected. This was greater than a previous study coordinated by Winefield in this industry (2002) where the response rate was 25%. A higher expectation about responses was due to anticipating that at the local level of their own workplace employees may be encouraged to express their opinions to improve their social circumstances and health in practical ways.

3.10 Data manipulation and data analysis

The quantitative data collected extended from June 2002 to July 2002 (see Appendix 6 for the chronological sequence of data collection for all parts of the research project). The data from the returned surveys were recorded into coded electronic files by the researcher using spreadsheets in Excel (Microsoft Office XP Professional 2002). The coded electronic files were imported into Statistical Program for Social Sciences (SPSS Inc 2000) for manipulation and analysis. The quantitative data from the SF–36 was interpreted using the instructions for data entry and scoring method contained in the SF–

36 Manual and Interpretation Guide (Ware 1993, 2000). The health status of the entire working population was determined and compared to the Australian norms.

The profile of scores of the SF–36 is presented in a standardised fashion so that an interpretation of the scale scores can be made for the health status of an individual or for the health status of a population. The profile of scores of the individual or group in question is compared to the profile of scores in a normative sample. Mean values for different SF-36 dimensions cannot be compared because each dimension is created in a different way and is independent of other dimensions. However, mean values for the same dimension for different populations can be compared.

The socio-demographic data is manipulated and analysed using the software package, Statistical Program for Social Sciences (SPSS Inc. 2000). The t (student's test) test is used to analyse whether SF–36 scores differed significantly from Australian norms. Where appropriate, the F test is also used (Fisher's test). Significance is assessed at the level of $p < 0.05$. However, because of the exploratory nature of the study, trends are indicated by $p < 0.10$. Pair wise comparisons are conducted to locate significant pairs in appropriate categories.

For the purpose of current analyses and in order to facilitate presentation of data or as a necessary requirement some independent variables are collapsed. The analysis firstly provides basic descriptive information on the distribution of selected socio-demiographic, exposure to risk factors, use of health services and work variables (maximum and

minimum value, mean and standard deviation). Subsequently, categorical and ordinal data are analysed utilizing Chi square ($\chi 2$) to compare results on the distribution of socio-demiographic and work variables with variables that are nominal or ordinal. To evaluate the relationship of work with interval data, one-way analysis of variance (ANOVA) is conducted. To further explore and interpret these variables, a significant ANOVA is followed by post-hoc tests, (Turkey's Honestly Significant Differences), to determine which of the groups are significantly different within each accrultation score on each of the independent variables examined.

Results are further analysed using a one-way analysis of variance (ANOVA) to examine main effects of each of the independent variables; age, sex, level of employment, on the dependent variables; SF-36 and its dimensions (PCS, MCS). In the event of differences between groups using ANOVA, a Tukey's Honestly Significant Differences test is performed, to determine which of the groups are significantly different for each of the independent variables examined. When a probability value is smaller than 0.05, the difference is considered to be statistically significant. For response variables that are nominal or ordinal, differences between groups are subjected to Chi-square analysis to test for significance. Finally, a series of Multiple Linear Regression are employed to determine if any combination of variables such as socio-demographics, employment characteristics, and exposure to risk factors provide a possible multivariate prediction in continuous dependent variables such as SF-36 dimensions. Data are examined for violation of the assumptions underlying multivariate methods prior to the analysis (Tabachnick & Fidell 1996).

Based on the literature (Harris, Sainsbury & Nutbeam 1999:16–35; Marmot and Theorell 1988:659–673; Stansfield, Head and Marmot 2000; Ware, 1993, 2000) some groups in the workplace are assumed to have lower health status and these are:

- employees who live alone
- employees from the lowest grades of employment
- employees who experience hospitalisations in the year prior to the study
- employees who consult medical practitioners more often than the average number of consultations for employees
- employees who consult alternative therapists more often than other employees more often than the average number of consultations for employees
- employees whose health is at risk with smoking
- employees whose health is at risk from drinking behaviour.

In contrast, other authors (Bates & Linder-Pelz 1987:20–25; Lupton & Najman 1995; Palmer & Short 1994:243; Russell & Schofield 1986:51–65; Short 1999: 90–95; Turrell 1995:113–135) point out that people with higher socio-economic levels, (i.e. those with good income, higher education) experience better health and have medical insurance, use private medical facilities and often live longer. Therefore, these groups of employees are expected to have better health status:

- employees from the highest grades of employment
- employees who have private health insurance additional to the compulsory Medicare levy

The physical health status of the employees as far as age is concerned decreases while the mental health status is less inclined to decrease with age (Ware et al. 1993, 2000:11:2).

Multivariant regression analysis is performed to detect differences of SF–36 scores for ten sub-groups defined in the study population by various socio-demographic variables. To test these hypotheses and to compare present data with the Australian norm a series of tables are presented and significant findings commented upon.

3.11 Qualitative component

The qualitative approach used to seek employees' insights about factors influencing employee health and how to improve employee health includes in-depth interviewing. These interviews are conducted with two groups of employees which are differentiated on the grounds of the responsibility that they have/or do not have to influence employee health. Hakim (1987:5) uses the term 'role holders' to indicate those informants who speak from their position of authority in the organisation rather than as private individuals and they use that authority to organise the work environment, assign tasks, and develop policies and practices that influence employee health.

3.12 Sampling process in the individual interviews

Two categories of employees are of interest to the qualitative component of this research — role holders (i.e. executive and line managers) and employees. The prime

considerations with the sampling process is to recruit and select informants who can provide deep understanding of the issue under investigation and that they are recruited and selected in such as way as give credibility to the findings and can be potentially generalised to another context or a larger population (Llewellyn, Sullivan & Minichiello 1999:185–186; Patton 1980:104–108, 1990:169–186).The sampling strategy for these two categories of employees differed.

A purposive sampling process was followed to recruit role holders. The researcher exercised judgment in recruiting role holders who were representative of those in senior executive positions and line management positions from both academic and general staff from across all departments of the workplace, as well as representatives of the two unions in the workplace. The trade unions are the National Tertiary Education Union (NTEU) for academic and general staff and the Community and Public Service Union (CPSU) for general staff only. These role holders were made up of two senior management executives, the Vice Chancellor and the Executive Director for Business, nine general staff managers and academic Heads of Schools and two union representatives, one from each of the NTEU and the CPSU. The purpose of this sampling was to select role holders and key informants who would provide 'information rich' data which would, according to Patton (1990:169) 'illuminate the questions under study'. The sample size was determined by Lincoln and Guba's (1985:202) 'redundancy factor' that is, no further new information was forthcoming from the last few interviews.

The sampling process for interviewing the second category of employees would follow a stratified purposive strategy (Llewellyn, Sullivan & Minichiello 1999:186–187). The intention was to ask all the staff who completed the general health survey to participate in an individual interview, and from those who agreed to be interviewed a representative sample would be selected for interviewing.

According to Majchrzak (1984:17), research can be hindered or helped by the status of the researcher in the organisation. As an internal researcher, research may be helped by access to the organisation being obtained more readily than would be the case if the researcher was unknown to the organisation. Internal researchers, although equipped with knowledge of political and organisational constraints, may be constrained by the bureaucratic aspects in the organisation. However, in this study the researcher gained access to the organisation without difficulty.

The internal researcher may also influence the cooperation of the informants. During the process of seeking interviewees in the research project, one employee complained about the project because s/he was concerned about personal information in the research project becoming part of the organisational knowledge. After discussion with the supervisors and the Human Research Ethics Committee it was mutually decided not to seek any further interviewees. In spite of this problem, twenty-seven employees who had already agreed to be interviewed provided a diverse sample with participants from both academic and general staff, men and women and from across a wide range of academic departments and administrative areas in the university. In spite of the methodological shortcomings of the

sampling process for the individual interviews, the groups of informants for the two categories, role holders and employees provided rich data and many opportunities for triangulation. The size of the groups and the method of conducting the interviews allowed theoretical saturation to occur (Strauss & Corbin 1990:188). Therefore the limitation in the sampling process was overcome.

The individual interviews generate empirical data that the survey instrument would not provide. The insights of role holders and employees are obtained with qualitative in-depth interviews, all of which were conducted and transcribed by the researcher. Role holder interviews (excluding senior executive) were conducted in April—May 2002, and the individual interviews between July and December 2002. With in-depth open-ended interviews two core questions formed the basis for the interaction with the informants.
The first question to role holders, excluding senior management role holders,was:

i. *What is the most difficult employee health issue that you have had to deal with?*

The first question was phrased in this way to encourage the interviewee to consider his/her most extreme experience in dealing with employee health issues. It was anticipated that this most extreme case could provide insights of maximum value to the research.

The senior executive role holders who were interviewed in February 2003, were not asked the same first question as the other role holders because in their day-to-day duties they do not deal with individual employee health matters. Their power and authority in

relation to employee health is exercised in relation to the development and implementation of policies that effect employee health. Their focus for employee health is strategic rather than operational. Therefore a question that generated understanding of their perspective of employee health is used:

i. What factors influence employee health?

Employees were asked this question as well and the same second question was asked of all the informants who were interviewed which was:

ii. If you had the opportunity to advise the organisation on improving employee health, what would you suggest?

Because of the 'national scorecard' of injuries and illnesses associated with work, (See Chapter 2:2.6), it was assumed that the health status of employees in this workplace could be improved rather than than take the position that the status quo of employee health was at an optimum level.

3.13 Data collection for interviews

The senior management role holders were interviewed at the end of the research data collection process. This was done so that the researcher had an opportunity to be informed by the other participants prior to interviewing the most powerful staff. There are forty interviews conducted with these two categories of employees and the breakdown of this number of interviews into the two categories of employees is presented here:

- role holders (n=13):
    - senior management executives (n=2)
        - Vice-Chancellor
        - Executive Director
    - general staff managers and academic Heads of School (n=9)
    - union representatives (n=2)

- employees (n=27)
    - academic staff (n=18)
    - general staff (n=9)

Towards the end of the interview each informant is given the opportunity to ask the researcher any questions. This opportunity allows the informant to interact, expand points of view, clarify issues, and participate in the interview process. Analysis of the qualitative data involves describing patterns, linkages and plausible explanations in the data in light of relevant contemporary theories in relation to work and health.

3.14 Analysis of qualitative data

The researcher transcribed the interview tapes verbatim, and then analysed the qualitative data manually. Later, the data was imported into a qualitative analysis software package to assist with the ease of linking data and concepts contained in the data (The software N5 developed by Richards (2000) was used for this purpose).

An interpretative approach is taken with the data, matching the concepts in the data with explanatory theories from the literature. The best fit was sought between the data and the analysis by using three techniques, which were: considering alternative explanations; analyzing contrasting cases, (in which informants differ from the usual opinions); and comparing the insights of the different categories of informants. Patton (1999a:1190–1193) states that these three techniques are ways to enhance the quality and credibility of qualitative analysis.

As each interview is transcribed and reviewed immediately, probing questions are anticipated in light of similar issues evident in previous interviews. This process allows the researcher to explore concepts that other informants have mentioned in their interviews by using some specific probing questions. Probing and follow-up questions are asked so that the greater understanding of issues can be achieved. These probing questions suggested by Stewart and Shamdasni (1990:83) are: leading questions seeking deeper meaning; testing questions seeking the limits of the concept under discussion; steering questions that bought the discussion back to the topic; and sometimes factual questions that reduced the personal risk for the participants.

This concept of adjusting the probing questions in subsequent interviews, as suggested by Minichiello et al. (1990:403) means that the researcher is: checking the data for different conceptions and meanings; testing the clarity of the informant's meanings by probing their conscious reflections; and delving more deeply into the same or similar issues that had been raised by other informants, resulting in the development of 'thick' descriptions of employee health experiences. 'Thick' description, according to Geertz (1973, reprinted in Bryman & Burgess 1999:346–368), refers not only to the microscopic detail of descriptive data, but also to the interpretation of that data in its cultural context. In this research, modifying the probing questions from one informant to another allows the researcher to trace similar issues through the responses of several informants and contributes to a time series analysis of these issues as the research progresses. This time series analysis is analogous to the time series analysis conducted in experiments (Yin 1989:115–116). Yin also states that within one case study a course of a phenomenon can

be traced so that the sequence or 'time series' of conditions can be followed to test various hypotheses about the phenomenon. This modified probing provokes deeper understanding of these issues as the process continues so that the interpretation of the data in the cultural context of work environment is enhanced.

Contrasting points of view, as presented in negative cases, are equally important as the viewpoints of the majority and are often highly informative. The questions that the analysis of negative cases must answer are: What does this particular perspective say about the phenomenon in question; and why does the minority or this informant hold this opinion?

Concepts that evolve from the analysis of the forty interviews are presented in logical sequence in response to the research questions, that is, health status of employees, factors impacting on that health, and remedial action. This presentation of qualitative data in Chapter 5 is in line with Silverman's guidelines (2000:240–249). At the first level of analysis the results of the qualitative data provide insights about factors influencing employee health and what can be done to improve employee health.

Informants in this thesis are referred to by pseudonyms and role holders are referred to by the letter 'R' followed by the pseudonym. Senior management role holders are not differentiated from the role-holder group. Extracts from the qualitative data are identified by numbers, and the first number referring to the chapter in which the extract first appears and the second number the order in which the extract is placed in the chapter.

Silverman (2000:246) devised this system so that the reader could easily locate the extract that is referred in the text.

3.15 Evaluation of qualitative method

The thoroughness and credibility of qualitative method relies, according to Gerber (1999:29), on hermeneutic rules rather than empirical rules that provide the criteria to evaluate quantitative data. The analysis of this qualitative data seeks the informant's meaning about employee health and all the different conceptions that relate to that central phenomenon. All the different responses of the various informants are equally important for what they reveal about the issue. Orientating the analysis of the interviews towards employee health and seeking clarity from the informants by probing their reflections is done consistently to build up a complex understanding of this multifaceted social problem. These rules of interpretation are followed in the analysis of this data so that the research questions are answered and that inferences drawn are plausible.

3.16 Integration of quantitative and qualitative data

Combining the results of the quantitative and qualitative data involves the process of triangulation. Triangulation is defined by Minichiello, Fulton and Sullivan (1999a:45) as the process by which the same issue is investigated in a variety of ways so that different types of evidence are produced to support a particular finding. The types of triangulation used in this study correspond to the methodological and data types according to Denzin's classification (1978:237). Methodological triangulation is used in this study because data is integrated from the two methods and data triangulation is used because qualitative data is collected from different categories of employees (Patton 1999a:1195).

The second level of analysis combines and reconciles the quantitative and qualitative data at the level of the whole case. As a concurrent and parallel mixed study (Tashakkori & Teddlie 2003:685–692) the two different types of data, quantitative and qualitative have different methods of analysis and different inferences develop from each method. These different results are pulled together to complement each other, to enable understanding the complex phenomenon of employee health (Gendron 2001:108–116). This process involves: combining the results of the quantitative and qualitative data, interpreting the results of the quantitative and qualitative data in relation to the literature; and analyzing the social relationships and structural practices that determine employee health in the workplace. This second level of analysis answers the question about the social relationships and structural practices that determine employee health in the workplace.

3.17 Validity and reliability of research project

The soundness of this research project is considered at three levels:

- quantitative and qualitative methods
- case study design
- applied research

The evaluation of quantitative and qualitative methods is discussed in Section 3.7.2 and 3.15 respectively therefore this section will focus on the remaining two levels, namely case study design and applied research.

A case study design is evaluated, according to Yin (1989:40–41), with the criteria of: *internal validity, external validity and reliability*. Internal validity enables clear causal

inferences to be made from the data (Yin 1989:40) and relies on pattern matching, explanation building and time series analysis (Yin 1989:109–120). These processes are used in triangulation of data within methods and between methods.

The patterns in the data are compared during the analysis to what is expected from the theories concerning the determinants of health in the work environment. The three common psychosocial theories of work and health, Demand-Control-Support Model, Person-Environment Fit Model and the Effort-Reward Model, indicate that employees with work overload, little control over work, and who feel unsupported, and unappreciated are likely to have lower health status than those employees who don't have these problems at work.

Explanation building takes pattern matching a step further to explain the phenomenon under investigation by stipulating causal links about it. Explanation building is done in the case study at the level of the employees' subjective opinions and then at the level of the social relationships and structural practices that determine employee health.

The sequence or 'time series' of conditions that lead to ill health becoming a critical event that changes an employees relationship with work is possible to be established by tracing the process of informants' reactions to their experiences of ill health. In this process a detailed description of informants' reactions to ill health over time is obtained. For example, some informants have experienced ill health in the distant past, others may have experienced ill health only in the recent past and some informants are recovering

and others are fully well but may or may not be concerned about getting ill again. The time series analysis relies on sequential analysis of each interview prior to proceeding to the next and developing appropriate probing questions. In this research by the process of analysing transcripts after each interview and developing appropriate probing questions, it was possible to trace employees' reactions to similar phenomena over time, in detail and with precision so that the critical conditions that determine the employees engagement with work and hence his/her productivity can be identified.

External validity deals with the problems of knowing whether a study's findings are generalisable beyond the immediate case study (Yin 1989:43). The external validity of the case study design relies on the plausibility of the inferences to general propositions rather than statistical inferences (Platt 1999:175) but Platt does qualify this by stating that there are degrees of plausibility. Lincoln and Guba (1985:128) put the matter more simply: 'samples need not be representative in the usual statistical sense to render generalizations warrantable'. In this case study, the degree of plausibility of the inferences from the study of one university to other similar workplaces will be tested by not only the ease with which an interpretation fits the data, but by the extent to which the interpretation provides a challenge to the fit of a theory. For example, with employee participation in the workplace risk management process which relies on the theory of risk identification, assessment and control it could be assumed that employees by the application of practices derived from this theory would ensure that the workplace is a healthy one.

Reliability in case study design refers to the likelihood of a second researcher when doing the case study over again arriving at the same findings and conclusions as the original researcher (Yin 1989:45). The reliability of the case study design is assured by the protocol followed in the conduct of the research. The chronological sequence of steps in the research process, the operational detail of the analysis of the data, and the systematic record keeping of decisions affecting the research ensure that another researcher when repeating this case study in this workplace would reach similar results.

As applied research in an interdisciplinary field of health and work this thesis is evaluated according to Klein (1996:211) on how well it accomplishes the task it sets out to do and how well it integrates knowledge. The criteria against which to judge this are: the integrative process; the role of disciplines; and communication action (1996:211–224). An integrative process is used throughout the thesis, exploring a complex construct with different methods of inquiry, reconciling the findings, and relating those findings to contemporary literature from the disciplines of Public Health and Business. The communication action refers to the persuasive nature of the thesis. The analytical story of employee health is communicated in the words of the workers and is reflected in/against the hard data of their health status.

Chapter 4

Health status of the employee population

4.1 Introduction

This chapter details and analyses the results from the socio-demographic and health related quality of life — SF–36 surveys. Thereby it assesses the health status of the employees in a specific workplace in the tertiary education industry and identifies factors that influence employee health.

The survey was sent to all current staff of the organisation. Of the 1047 surveys distributed, 407 were sent to academic staff and 640 were sent to general staff. The overall response rate was 48.9% (n=514), which included academic staff, 42.8% (n=176), and general staff, 52.9% (n=338). The number of complete data sets available for analysis was 500, with 43.2% (n=176) coming from academic staff and 50.6% (n=324) from the general staff. The survey response is recorded in Table 4-1 below.

Table 4-1: Survey response

	Academic staff	**General staff**	**Total**
Distributed	407	640	1047
Responded	176 (42.8%)	338 (52.9%)	514 (48.9%)
Complete data sets	176 (43.2%)	334 (50.6%)	500

4.2 Socio-demographic characteristics

Table 4-2: Demographic profile of academic and general staff

	Academic staff			General staff	
	N* (176)	%		N* (324)	%
Age (years)					
Greater than 35	6	3.4		47	14.6
35-44	54	30.9		96	29.7
45-54	65	37.1		132	40.9
55 and over	50	28.6		48	14.8
Sex					
Male	97	55.1		133	41.2
Female	79	44.9		190	58.8
Living Arrangements					
Partnership	133	75.6		235	72.6
Living alone	43	24.4		88	27.4
Place of birth					
Australia	110	66.0		292	86.0
Overseas	58	34.0		47	14.0
Residence prior to employment					
Australia	126	75.0		306	90.0
Overseas	42	25.0		34	10.0
Duration of employment (years)					
1-3	36	20.5		59	18.3
4-10	63	35.8		88	27.3
11-15	30	17.0		61	18.9
16-20	20	11.4		39	12.2
21 and over	27	15.3		75	23.3
Grade of employment					
Academic			General		
A	22	12.5	1-2	18	5.6
B	63	35.8	3-4	112	34.7
C	51	29.0	5-6	116	35.9
D	27	15.3	7	36	11.1
E&E and over	13	7.4	8-10 and over	41	12.7

*Note: Not all questions were fully answered, therefore, subtotals may not always be equal N=176 for academics and N=324 for general staff.

4.2.1 Age and gender

The academic staff mean age is 48.7 years with a standard deviation of 8.2 years and the age range is 25 to 68 years. The general staff mean age is 44.6 years with a standard

deviation of 9.4 years with the age range of 18 to 67 years. The majority of the study population, (59% or 295 employees), is over the age of 45 years of age.

Of the 176 academic staff informants who participated in the survey, 55% (n=97) are male and 45% (n=79) female. On the other hand, of the general staff, 41% (n=133) are male and 59% (n=190) are female. This profile of informants is consistent with our expectations of the profile of all the current staff of the workplace (academic staff, 65% males and 35% females; general staff, 45% male, 55% female).

4.2.2 Living arrangements and place of birth

Twenty-four per cent of academic staff and 27% of general staff lived alone at the time of the study. Over all, there were 131 employees living alone at the time of the survey.

Regarding the place of birth, thirty four per cent of academic staff were born overseas and 25% came from overseas to work at the university. Fourteen per cent of general staff were born overseas and 10% came from overseas to work at the university.

4.3 Employment characteristics

Findings indicate that around 56% of academic have been in the workplace for ten years or less. In contrast 45% of general staff had been employed in the workplace for up to ten years. Also, 15% of academic staff and a little over 23% of general staff had been employed for more than twenty years.

The comparison of grades of employment between academic and general staff demonstrates that there are 7.4% of academic staff in the highest grades of employment at level E and above, with 12.7% of general staff at level 8 and above.

There are eighty-one employees in the study population in the highest grades of employment. These grades consisted of levels D, E and above for academic staff and grades HEO 8, 9 and 10 and above for general staff. There are 215 (43%) employees in the lowest grades of employment. These lowest grades were made up of academic levels A and B and HEO 1, 2, 3, and 4 for general staff.

4.4 Health services utilisation data

Table 4-3: Pattern of health service utilisation of academic and general staff in the last twelve months

	Academic staff		General staff	
	N	%	N	%
Health insurance				
None	44	25.0	122	37.8
Partial	36	20.5	65	20.1
Full	96	54.5	136	42.1
Doctor consultations				
None	33	18.8	47	14.5
1-2	74	42.0	147	45.4
3-4	47	26.7	70	21.5
5-6	12	6.8	31	9.6
≥7	10	5.7	29	9.0
Total doctor consultations				
	473		972	
Alternative therapy consultations				
None	126	71.6	199	61.4
1-2	17	9.7	42	13.0
3-4	7	4.0	35	10.8
5-6	9	5.1	19	5.8
≥7	17	9.6	29	9.0
Total alternative consultations				
	325		685	
Hospitalisations				
Yes	20	11.4	43	13.3
No	156	88.6	297	86.7

4.4.1 Health insurance

Seventy-five per cent of academic staff pay extra for private health insurance. Of those insured, 27% have basic hospital cover only. Sixty-two per cent of general staff have private health insurance. Of those insured, 32% have basic hospital cover only.

4.4.2 Doctors consultations

For academic staff, 143 (82%) reported at least one visit to a medical practitioner in the previous twelve months. Of the 143 academic staff who reported visits to a medical practitioner the average number of visits were 3.3 with a standard deviation of 3.4 visits. Of them, 84% reported between one to four visits to a medical practitioner. Similarly, 277 (86%) of the 324 general staff who provided information reported at least one visit to a medical practitioner in the twelve months prior to the survey. Of the general staff that visited medical practitioners the average number of visits was 3.5 with a standard deviation of 3.1 visits. Of those staff 78% reported visiting a medical practitioner between one to four times.

4.4.3 Alternative therapy consultations

Fifty (28%) academic staff reported visits to an alternative therapist. The mean number of visits was 6.5, (s.d. 7.5 visits). Of this group, 66% reported visiting an alternative therapist between one and six times. Of the general staff 125 or 38.8% reported visits to an alternative therapist. The average number of visits was 5.5, with a standard deviation of 6.7 visits. Of these 125 staff, 77% reported visiting an alternative therapist between one and six times.

4.4.4 Hospitalisations

About eleven per cent of academic staff experienced hospitalisation in the previous twelve months. Thirteen per cent of general staff had also been inpatients in the previous twelve months. In the preceding year, sixty-three (12.6%) employees experienced a stay in hospital. There is no association between age and gender for hospitalisation for both academic and general staff.

4.4.5 Total health service utilisation

One hundred and thirty employees (26%) reported visiting a doctor more than four times in the previous twelve months, and seventy-four employees (15%) reported visiting an alternative therapist more than five times in the same period.

There is a significant relationship between doctor consultations and alternative therapy consultations for general staff and academic staff (Chi-square (trend)=18.38, $p< 0.0001$; Chi-square (trend)=6.005, $p=0.014$ for general and academic staff respectively). For example, the proportion of general staff who visit alternative therapists increases with the increase of their doctor consultations.

Total health service utilisation by general and academic staff is made up of the combination of the medical and alternative therapy consultations for both groups in the previous year. In total, members of academic staff consulted health services (medical and alternate therapies) in the year prior to the survey on 798 separate occasions. General

staff consulted health services (medical and alternative therapies) on 1657 separate occasions.

4.5 Risk behaviour

Tables 4-4 and 4-5 provide summaries of the smoking and drinking behaviour of the employee population.

Table 4-4.: Patterns of smoking among academic and general staff

	Academic staff		General staff	
	N (N=176)	%	N (N=322)	%
Non & ex-smokers				
never smoked	108	61.4	169	52.5
stopped smoking	53	30.1	98	30.4
Current smokers				
process of stopping	4	2.3	9	2.8
thinking of stopping	9	5.1	34	10.6
cannot stop	2	1.1	12	3.7

Table 4-5: Patterns of alcohol consumption among academic and general staff

	Academic staff		General staff	
	N (N=173)	%	N (N=320)	%
No or low risk drinking				
do not drink at all	8	4.6	27	8.4
one drink occasionally	41	23.7	86	26.9
one drink once or twice/week	42	24.3	109	34.1
one drink most days of the week	59	34.1	71	22.2
High risk drinking				
more than one drink most days of the week	23	13.3	27	8.4

4.5.1 Current smoking and alcohol consumption

Overall smoking behaviour is a health risk for seventy employees. Smoking is a current health risk for 8% of academic staff and 17% of general staff.

For fifty employees in the study population their alcohol consumption is a risk to their health. As far as risk drinking is concerned, 13.3% of academic staff consume more than one alcoholic drink everyday, whereas the corresponding figure for the general staff is 8.4%.

There is a significant association between smoking and risk drinking for academic staff (Chi-square=5.72, df=1, p=0.017) that is, those who smoke also engage in drinking that is a risk to their health. There is no association between smoking and risk drinking for general staff (the proportion of smokers of general staff is double that of academic staff).

4.5.1.1 Age gender and grade of employment associations with smoking and drinking for academic and general staff

For academic staff, the analysis showed that the age group, 45 to 54 years are more likely to smoke than the younger or older age groups (Chi square=6.16, df=2, p=0.046) There is no association between either gender or grade of employment and smoking for academics. Older academics, that is, those in the age group 55 years and over, are most likely to have high risk drinking behaviour than any other age group (Chi-square=6.82, df=1, p=0.009). There is no association for either gender or grade of employment with risk drinking behaviour.

For general staff, HEO levels 3 and 4 are most likely to smoke than any other grade of employment (Chi-square=9.87, df=4, p=0.043). There is an indication ($p < 0.09$) that females are more likely to smoke compared to males, and the association of age and smoking is not significant. Males are more likely to engage in high risk drinking compared to females (Chi square=9.29, df=1, p =0.002). There is no association between either age and grade of employment and risk drinking behaviour.

4.6 General health status survey

There are significant differences in the profile of scores for academic and general staff apparent in Table 4-6. Academic staff scored significantly higher on the SF–36 profile of scores for the dimensions of Physical Functioning, Bodily Pain and Physical Component Summary (t=4.48, df=498, p =0.0001; t=2.21, df=498, p =0.028; t=3.06, df=452, p=0.002, respectively). There are no significant differences between academic and general staff with the dimensions of Role–Physical, General Health, Vitality, Social Functioning, Role-Emotional Mental Health and Mental Component Summary scores.

Table 4-6: SF–36 Profile of scores for study population as a whole, and academic and general staff

	Study population		Academic staff		General staff	
	(N=500)		(N=176)		(N=323)	
SF-36 Dimensions	Mean	S D	Mean	SD	Mean	SC
Physical Functioning (PF)[c]	90.1	14.7	93.4	9.0	88.2	16.7
Role Physical (RP)	86.7	29.8	87.8	27.9	86.0	30.9
Bodily Pain (BP)[a]	79.8	20.9	82.6	19.5	78.3	21.5
General Health (GH)	73.5	18.8	74.2	18.4	73.1	18.9
Vitality (VT)	62.0	20.7	63.6	21.0	61.2	20.6
Social Functioning (SF)	88.1	20.6	89.4	19.3	86.4	21.2
Role Emotional (RE)	82.9	34.0	83.3	33.2	82.7	34.4
Mental Health (MH)	75.6	16.9	75.2	16.3	75.9	17.3
Physical Component Summary (PCS)[b]	52.7	7.8	54.0	6.2	52.0	8.4
Mental Component Summary (MCS)	48.9	10.9	48.6	10.4	49.0	11.3

a=$p<0.05$; b=$p<0.001$; c=$p<0.0001$

In keeping with the traditional methods of presentation of the results of the SF–36, the frequency distribution for the dimension scores of the study population are displayed prior to the discussion of the mean scores for each dimension.

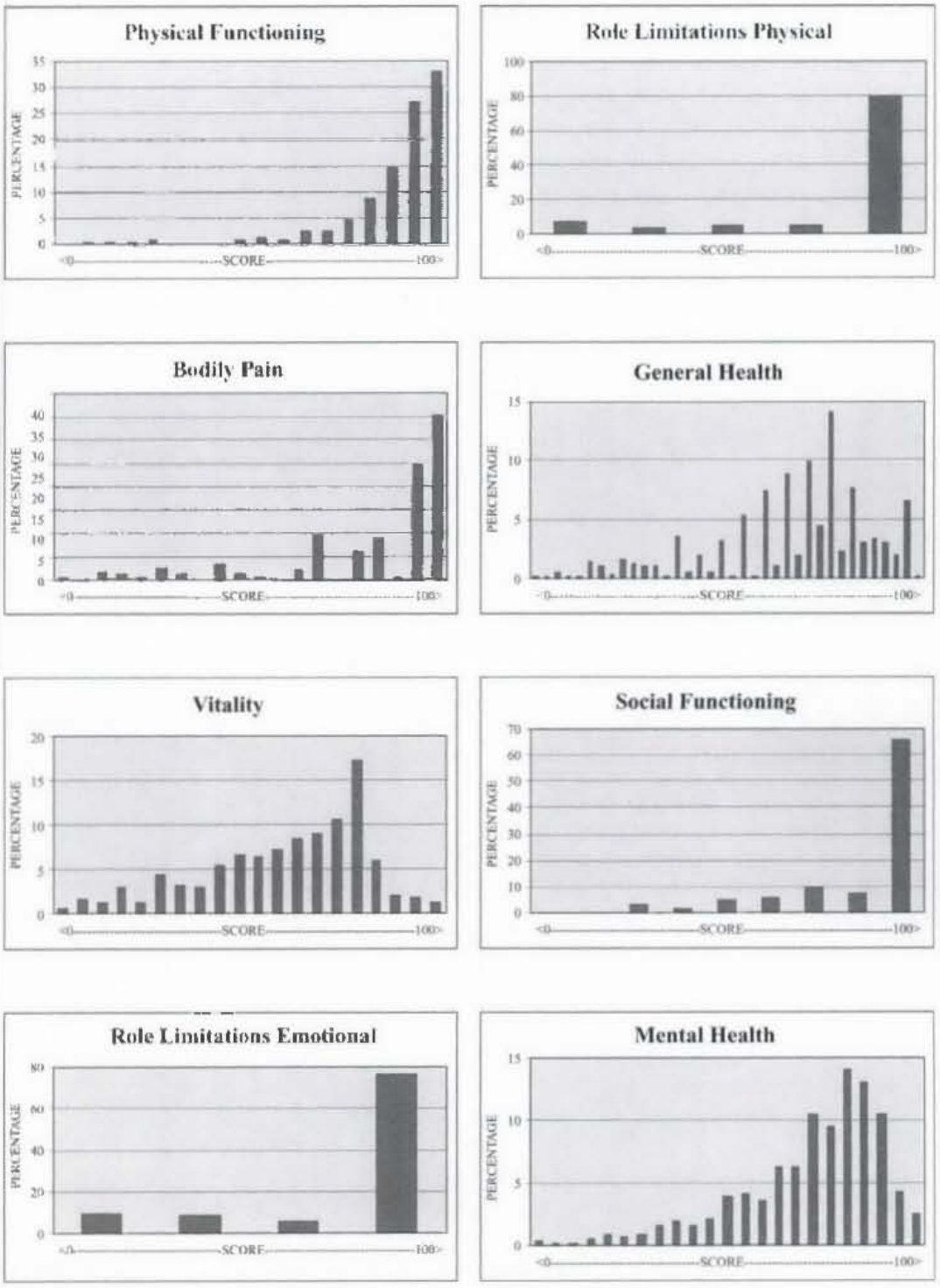


Figure 4-1 : Frequency distribution of dimension scores of SF–36 for the study population

The frequency distribution for the dimension scores obtained from the whole employee population for the eight dimensions of health is displayed in Figure 1. Results of the SF–36 of the employee population are read from left to right. For Physical Functioning, Role Limitations-Physical, Bodily Pain, Social Functioning and Role Limitations Emotional, the highest possible score was 100 and indicates no limitation or disability. In the study population the frequency distribution for these five dimensions show scores achieved and the percentage of the population achieving the score is measured on the Y axis.

General Health, Vitality and Mental Health dimensions measure a wider range of negative and positive health states. A midrange score on these dimensions occurs when there are no limitations or disability. In the study population these dimensions demonstrate the bipolar pattern.

Using tests for Normality the distribution for the physical and mental component summary scores for academic and general staff approximated the normal distribution. Using parametric tests patterns in the frequency distribution can be compared against the mean scores for each dimension from the normative data available from the Australian population.

4.7 SF-36 summary scores of different groups in the research population

In Table 4-7 the three categories of socio-demographic data: the demographic data, the health services utilisation data, and the risk behaviour data are presented with the corresponding Physical (PCS) and Mental (MCS) Component Summary scores from the SF–36 profile.

Table 4-7: Physical component summary and mental component summary scores of the SF–36 for academic and general staff for different socio-demographic variables

	Academic staff				General staff			
	PCS		MCS		PCS		MCS	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)
Age (years)			b		a		b	
Less than or equal to 44	55.1	(6.2)	45.4	(11.4)	53.2	(8.8)	47.0	(11.1)
45-54	53.1	(6.8)	49.3	(9.6)	50.5	(8.5)	49.8	(11.8)
Equal to or greater than 55	53.9	(5.4)	51.6	(9.2)	52.2	(6.8)	52.4	(9.2)
Sex								
Male	53.9	(5.7)	49.5	(10.2)	51.9	(7.8)	50.1	(10.8)
Female	54.1	(6.9)	47.6	(10.6)	52.1	(8.9)	48.1	(11.5)
Living arrangements								
Partnership	53.9	(6.4)	48.5	(10.6)	52.4	(7.9)	49.5	(10.8)
Living alone	54.2	(5.6)	48.9	(9.9)	50.9	(9.7)	47.5	(12.3)
Duration of employment (years)								
1-3	55.9	(7.2)	46.8	(12.5)	52.4	(9.0)	46.6	(12.8)
4-10	53.1	(6.2)	49.1	(9.7)	51.9	(7.8)	49.9	(10.8)
11-15	53.2	(7.1)	48.5	(9.2)	52.3	(8.8)	48.1	(11.6)
16-20	53.9	(5.4)	46.4	(11.6)	53.3	(7.7)	49.4	(10.3)
Equal to or greater than 21	54.5	(3.9)	51.9	(8.8)	50.7	(8.9)	50.3	(10.6)
Grade of employment								
Academic General								
A 1-2	53.8	(8.3)	45.6	(13.2)	51.8	(4.9)	49.9	(12.3)
B 3-4	53.7	(6.3)	48.5	(9.4)	51.3	(9.5)	49.9	(10.6)
C 5-6	54.1	(5.4)	47.8	(11.2)	52.2	(8.3)	49.4	(10.7)
D 7	55.6	(3.9)	52.3	(8.8)	53.6	(8.6)	44.8	(13.5)
Eq. to or gr. than E (Acad.) and 8 (Gen.)	51.8	(8.8)	50.0	(8.7)	51.9	(6.9)	48.5	(11.8)

a=p<0.05; b=p<0.01

4.7 1 Age and physical component summary and mental component summary scores

There are significant differences between the age groups in the general staff profile for both the Physical and Mental Component Summary scales (F=3.561, df=2, 320, p=0.031; F=4.787, df=2, 320, p=0.009 for PCS and MCS, respectively). Further post hoc comparisons revealed that the age group category less than or equal to 44 years and the age group category 45–54 years are significantly different, with the younger group achieving higher physical component summary scores and lower mental health component summary scores.scores.

The academic staff sub-groups for age are significantly different in the Mental Component Summary scale (F=5.351, df=2, 172, p=0.006). Post hoc analysis revealed that MCS scores for academic staff 55 years or older were significantly higher when compared to those 44 years of age and younger.

No differences were found for the variables of sex, living arrangements, duration and grade of employment in the mean scores for the Physical and Mental Summary component scale scores for both academic and general staff. However, there was a trend ($p< 0.10$) for the general staff who lived alone to be worse in the mental component summary scores, when compared to those MSC scores for general staff not living alone.

4.8 Health service utilisation and physical component summary and mental component summary scores

Table 4-8 presents the comparison of the mean Physical (PCS) and Mental (MCS) Component Summary scores of the SF–36 for different health service utilisation variables.

Table 4-8: Physical component summary and mental component summary scores of the SF–36 profile for academic and general staff for different health service utilisation variables

	Academic staff				General staff			
	PCS		MCS		PCS		MCS	
Health insurance								
None	53.2	(6.1)	48.5	(9.7)	51.6	(9.2)	47.5	(11.9)
Partial	54.5	(5.5)	47.2	(11.7)	50.9	(9.3)	49.7	(10.6)
Full	54.2	(6.6)	49.2	(10.2)	52.9	(7.2)	49.9	(10.8)
Doctor consultations	a				c		d	
None	55.4	(3.7)	48.3	(10.7)	53.2	(5.8)	53.4	(6.5)
1-2	54.8	(6.1)	50.5	(9.5)	53.3	(7.6)	49.8	(10.3)
3-4	52.9	(6.6)	47.3	(10.3)	50.8	(8.5)	48.5	(11.7)
5-6	53.4	(6.8)	45.9	(11.0)	51.7	(8.7)	47.1	(13.2)
7 or more	49.5	(9.5)	45.1	(14.1)	46.2	(12.4)	40.7	(14.4)
Alternative therapy consultations	a							
None	54.9	(5.5)	48.8	(10.4)	52.3	(7.8)	50.3	(10.3)
1-2	51.9	(6.0)	53.7	(5.5)	52.0	(9.7)	48.6	(11.2)
3-4	54.4	(7.5)	43.4	(11.9)	52.8	(9.1)	45.2	(12.2)
5-6	50.5	(7.2)	46.5	(9.0)	51.5	(8.4)	48.2	(12.0)
7 or more	50.9	(9.1)	45.4	(12.5)	49.1	(9.8)	46.0	(14.9)
Hospitalisations					b		a	
Yes	52.6	(5.8)	48.3	(10.3)	48.2	(10.2)	44.9	(13.4)
No	54.2	(6.3)	48.7	(10.4)	52.6	(8.0)	49.6	(10.8)

a=p<0.05; b=p<0.01; c=p<0.001; d=p<0.0001

4.8.1 Doctor consultations and physical component summary and mental component summary scores

Significant associations were found in the mean scores for the Physical Component Summary Scale scores for the sub-group general staff who reported visiting a doctor in the twelve months prior to the study (F=5.10, df=4, 319, p=0.001 for the PCS of general staff). Using pair-wise comparisons there are significant differences for the physical component summary scale.

There are also significant associations in general staff sub-groups for doctor consultations for the Mental Component Summary scale (F=6.58, df= 4, 319, p=0.0001). Within the doctor consultation sub-groups, there are significant differences in the pairs.

For both the academic and general staff, those who recorded more consultations (i.e. 7 of more visits to a medical practitioiner) scored significantly lower in the PCS and the MCS scores than any other consultation category.

4.8.2 Alternative therapy consultations and physical component summary and mental component summary scores

The differences in the sub-groups for the academic and alternative therapy consultations are significant as far as their mean PCS scores are concerned (F=3.03, df=4, 171, p=0.019). Further post hoc comparisons revealed that those academics who never visit alternative therapists have significantly higher physical health scores than those who visited five or more times.

Both academic and general staff show trends ($p<0.1$) in the groups for alternative therapy consultations in the mean scores of their Mental Component Summary scores with employees who more frequently visit alternative therapists showing a trend towards lower mental health scores.

4.8.4 Hospitalisations and physical component summary and mental component summary scores

For the general staff there are significant differences in the physical component summary and mental component summary scores for staffs who are hospitalised in the previous year compared to those who were not hospitalised. Based on unequal variance the scores are: $t=2.68$, $df=50$, $p=0.01$; $t=2.17$, $df=50$, $p=0.035$ for PCS and MCS. The general staff who experienced hospitalisation had worse health status than those who were not hospitalised.

4.9 Smoking and alcohol consumption and physical and mental component summary scores

Table 4-9: Physical and mental component summary scores of the SF–36 scores for academic and general staff and risk behaviour of smoking and drinking

	Academic staff				General staff			
	PCS		MCS		PCS		MCS	
Smoking								
Non smokers and ex smokers	53.8	(6.3)	48.7	(10.2)	51.8	(8.4)	49.6	(10.9)
Current smokers	56.2	(4.8)	47.8	(12.6)	52.8	(8.9)	46.2	(12.3)
Drinking	a							
No or low risk drinking	52.1	(8.3)	49.5	(9.5)	51.3	(9.6)	47.2	(13.1)
Medium drinking	54.8	(4.8)	49.2	(10.2)	52.5	(7.5)	49.7	(10.3)
High risk drinking	54.3	(6.5)	44.8	(12.1)	50.8	(9.3)	51.8	(8.3)

a=$p<0.05$

Within the sub-groups for drinking there is significance differences in the Physical Component Summary scale scores for the academic staff sub-groups: ($F=3.34$, $df=2,170$, $p=0.038$). Using post hoc comparisons for the academic PCS drinking groups there are significant differences between the no or low risk drinking group and the moderate drinking group — the no or low risk drinking group having worse physical health than the moderate drinking group.

The general staff sub-groups showed a trend ($p<0.1$) for Mental Component Summary scales scores for both smoking and drinking. For general staff, those who smoked displayed a trend towards lower mental health and there was a trend showing better mental in high risk drinkers.

4.10 Comparison of SF–36 scores of the employee population with Australian norms

Table 4-10 presents the mean and standard deviation for the Australian population (n=18,468) and Australian employed persons sub-group (n=11,711) norms and the study population (n=500).

Table 4-10: The mean of SF–36 scale scores for study population and Australian population and employed persons norms

	Study population		Australian SF–36*		Australian SF-36 employed** persons	
	(N=500)		(N=18,468)		(N=11711)	
SF-36 Dimensions	Mean	SD	Mean	SD	Mean	SD
Physical Functioning (PF)	90.1	14.7	82.6	23.9	88.8	21.64
Role Physical (RP)	86.7	29.8	79.9	35.1	86.7	43.28
Bodily Pain (BP)	79.8	20.9	76.8	25.0	80.3	32.46
General Health (GH)	73.5	18.8	71.6	20.3	75.6	21.64
Vitality (VT)	62.0	20.7	64.5	19.8	66.7	21.64
Social Functioning (SF)	88.1	20.6	85.0	22.5	87.9	32.49
Role Emotional (RE)	82.9	34.0	82.9	32.3	87.2	43.28
Mental Health (MH)	75.6	16.9	75.9	17.0	77.2	21.64
Physical Component Summary (PCS)	52.7	7.8	49.8	10.2	52.2	10.82
Mental Component Summary (MCS)	48.9	10.9	50.1	10.0	50.6	10.82

*Source for Australian norms: Australian Bureau of Statistics: *Australian Health Survey* (1995)
**Source for Australian employed person's sub-group norms: Australian Bureau of Statistics: *Australian Health Survey* (1995:13-15)

The study population scores significantly better than the Australian population norms for the dimensions of Physical Functioning, Role-Physical, Bodily Pain, General Health Social Functioning and the Physical Component Summary scores (t=6.93, df =18966, p=0.0001; t=4.26, df=18966, p =0.0001; t=2.64, df=18966, p =0.008; t=2.1, df=18966, p =0.03; t=3.07, df=18966, p =0.002; t=6.29,df=18966, p =0.0001, respectively). However, the study population scores significantly lower that the Australian population norms in the dimensions of Vitality scale and the Mental Component Summary scale (t=2.76, df=18966, p =0.006; t =2.72, df=18966, p =0.007 respectively). The difference in the

Role Emotional and Mental Health scales for the study population compared to the Australian norm for these scales are not statistically significant.

In comparison with the employed person's sub-group of the Australian population norms, the study population scores significantly worse in the Vitality, Role–Emotional, and the Mental Component Summary scale. The study population scores obtained compared to those of the Australian employed person's sub-group population norms are: ($t = 4.74$, $df = 12209$, $p = 0.0001$; $t = 2.18$, $df = 12209$, $p = 0.03$; $t = 3.51$, $df = 12209$, $p = 0.0004$; respectively). There was no significant difference in the other scales or the PCS scores in the two groups.

4.11 Gender and the profile of scores for the SF–36

The profile of SF–36 scores for males and females in the study population are now compared. Table 4-11 provides the comparison of male and female SF–36 profile of scores for the whole study population.

Table 4-11: The means of SF–36 dimensions of the study population (academic and general staff) by gender

	Study population (Males=230) (Females=269)	
	Mean	**SD**
Physical Functioning (PF)[a]		
males	91.5	12.9
females	88.7	15.9
Role Physical (RP)		
males	88.7	28.5
females	84.9	30.9
Bodily Pain (BP)		
males	80.2	20.0
females	79.4	21.6
General Health (GH)		
males	71.8	19.3
females	74.9	18.2
Vitality (VT)[b]		
males	64.6	20.2
females	59.7	21.0
Social Functioning (SF)		
males	89.8	19.6
females	86.6	21.3
Role Emotional (RE)		
males	85.9	31.8
females	80.3	35.7
Mental Health (MH)		
males	76.9	17.0
females	74.4	16.7
Physical Component Summary (PCS)		
males	52.7	7.1
females	52.7	8.4
Mental Component Summary (MCS)		
males	49.8	10.5
females	48.0	11.2

a=$p<0.05$; b=$p<0.01$

There are significant differences found in the male and female scores for the SF–36 for the study population in the Physical Functioning and Vitality, ($t=2.18$, $df=495$, $p=0.03$; $t=2.67$, $df=497$, $p=0.008$ respectively) with males scores showing better health scores than females. In addition, there was a trend ($p<0.1$) in males to score higher than females in General Health, Social Functioning, Role Emotional, Mental Health and Mental Health Component Summary Scores. The study population is made up of 46% males (n=230) and 54% females (n=269).

Significant differences between male and female general staff occur in the SF–36 dimension of Vitality (VT) with the males scoring higher than females ($t=2.22$, $df=321$, $p= 0.027$). There are no significant differences between male and female on the general staff on the other scores on the SF–36. There are no significant differences between male and female academic scores on the SF–36 profile.

4.12 Summary of the SF–36 scores of the employee population

The following points summarise the results of the SF–36 scores of the employee population:

- The academic staff experience better physical health than does the general staff, achieving better scores in the Physical Functioning, Bodily Pain and Physical Component Summary Scores (See Table 4-6)
- The study population achieves significantly higher scores than the Australian population for many of the dimensions of the SF–36 particularly those measuring

physical health, but the study population achieves lower scores for some of those dimensions measuring mental health (See Table 4-10)

- The study population attains lower scores than the Australian employed person's sub-group norm in scales measuring mental health. (See Table 4-10)
- There are differences noted between male and female scores in the study population and these are in line with the gender differences found in the Australian *National Health Survey*, with males achieving higher scores except on the dimension of General Health for which females achieve the higher scores.

4.13 The SF–36 profile of scores for employee groups within the research population and the Australian employed persons sub-group

Table 4-12 presents the SF-36 health status profile for the ten groups identified from the socio-demographic data compared to the Australian employed person's sub-group norms.

Table 4-12: The mean of the SF–36 dimension scores and the standard deviation (sd) for the ten sub-groups of the study population with the Australian employed persons' sub-group SF–36 scores

	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
Aust SF–36 Employed person's norms* n=11711	88.8 (21.6)	86.7 (43.3)	80.3 (32.4)	75.6 (21.6)	66.7 (21.6)	87.9 (32.5)	87.2 (43.3)	77.2 (21.6)	52.2 (10.8)	50.6 (10.8)
Highest Employment grades n=81	92.2 (10.7)	89.8 (27.6)	81.8 (16.8)	71.1 (18.8)	65.3 (21.5)	90.0 (19.1)	86.4 (28.3)	77.5 (16.3)	53.1 (6.6)	50.0 (10.4)
Additional Insurance n= 335	90.9 (13.8)	88.7 (26.9)	80.2 (20.5)	75.0 (17.1)	63.1 (20.5)	89.2 (19.5)	84.1 (33.3)	76.6 (16.2)	53.1 (7.4)	49.4 (10.7)
Age 45 and Older n=295	89.2 (14.8)	86.4 (30.2)	79.7 (18.6)	72.9 (19.3)	64.3 (20.6)	90.3 (19.3)	86.4 (32.2)	77.4 (16.5)	52.9 (7.5)	50.4 (10.6)
Lowest Employment Grades n=215	88.8 (15.9)	85.5 (30.0)	79.6 (22.9)	74.3 (19.4)	61.3 (20.2)	88.0 (20.3)	83.6 (32.8)	75.7 (17.4)	52.3 (8.3)	49.0 (10.7)
Risk Drinking n= 50	89.0 (17.8)	86.0 (30.4)	78.1 (22.5)	73.0 (18.5)	62.9 (20.4)	86.3 (22.2)	82.7 (37.6)	74.1 (17.9)	52.4 (8.3)	48.5 (10.7)
Living alone n=131	89.0 (16.5)	84.4 (31.5)	75.3 (21.2)	73.7 (18.8)	60.8 (21.2)	84.8 (22.8)	80.4 (36.2)	73.9 (18.3)	52.0 (8.7)	47.9 (11.5)
Smoking n=70	89.0 (15.4)	91.1 (25.6)	82.4 (22.5)	69.7 (21.1)	59.1 (21.8)	83.9 (22.2)	76.7 (36.9)	74.3 (18.5)	53.5 (8.2)	46.6 (12.3)
Alternative therapy consults (5 or more) n= 74	86.4 (15.7)	77.7 (34.5)	72.2 (20.2)	67.0 (20.0)	55.7 (22.2)	85.0 (21.7)	75.2 39.8)	71.5 19.8)	50.3 8.9)	46.5 (12.9)
Medical consults (4 or more) n= 130	85.3 (18.4)	79.8 (34.9)	74.0 (24.1)	64.5 (22.9)	54.9 (22.3)	83.4 (23.4)	77.4 (37.2)	69.6 (20.5)	50.6 (9.4)	45.8 (12.9)
Hospitals n= 63	84.4 (18.7)	75.4 (38.5)	70.2 (23.2)	65.5 (23.7)	56.7 (20.8)	81.2 (26.4)	74.2 (42.0)	70.3 (18.0)	49.5 (9.3)	46.1 (12.6)

*Source for Australian employed person's sub-group norms:
Australian Bureau of Statistics: *Australian Health Survey* (1995:13–15)
Standard deviation in brackets

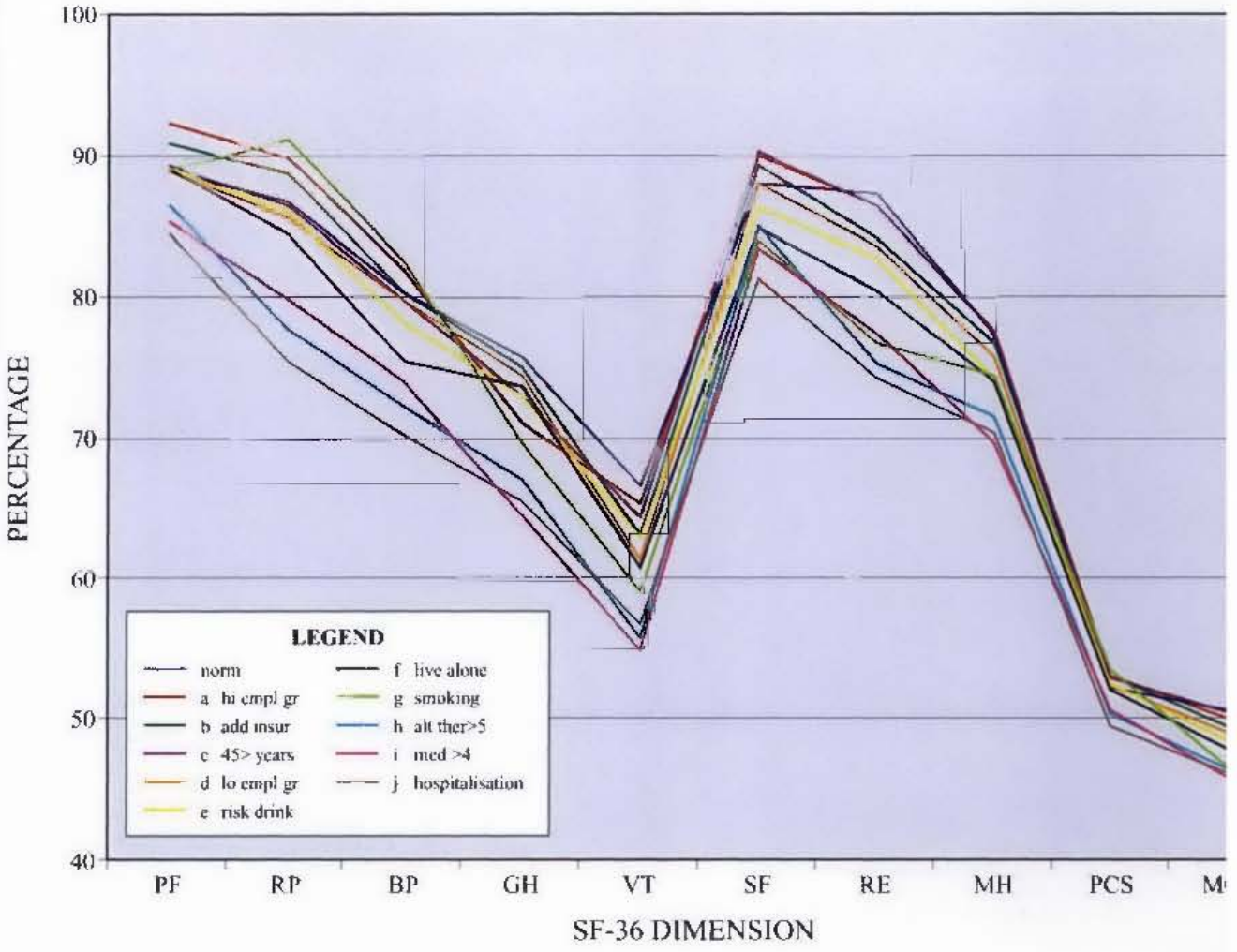
Multiple regression analysis with the physical component summary scales and the mental component summary scales of the study population with eight of the variables characterised by these groups identify distinctive bands of health status in relation to the Australian employed person's norms. (The alternative therapy group had to be removed from the analysis because of the absence of data in this category. With the polar opposite, highest and lowest grades of employment, only highest grades were included in the regression analysis.)

The regression analysis for physical health status is: PCS=53.54 + 1.926 Insurance, – 0.986 Living alone, -2.117 Hospitalised, – 2.127 Doctor consultation, – 0.983 Risk drinking, + 1.159 Smoking, -2.195 Mature age, +0.434 Highest grade of employment. The highest physical health status is achieved by those who have medical insurance, smoke, occupy the highest grades of employment, live with a partner, are of younger than 40 years of age, do not drink heavily, do not see a doctor more than 4 times in a year, and have not been hospitalised in the last year. The lowest physical health is achieved by those who have been hospitalised in the year, consult a doctor more than 4 times a year, are aged 45 years and over, consult a doctor more than 4 times a year, live alone and engage in risk drinking behaviour and do not have additional health insurance.

The regression analysis for mental health status is: MCS=47.485 + 0.627. Insurance – 1.484 Living alone, - 0.782 Hospitalisation, - 3.825 Doctor consultations, + 0.082 Risk drinking, -3.354 Smoking, + 4.435 Mature age, - 0.199 Highest grade of employment.

The best mental health status is found in employees who: have health insurance, engage in risk drinking behaviour, and who are of 45 years, have less than 4 medical consultations a year, have not been hospitalised. The worst mental health is found in employees who visit a medical practitioner more than four times in the year, have been hospitalised, smoke, live alone, were hospitalised in the previous year and were in the highest grades of employment.

Figure 2 shows the graphical representation of SF–36 profile of these ten groups in the employee population against the SF–36 profile for the Australian employed person's sub-group.


100
90
80
70
60
50
40
PERCENTAGE
LEGEND
norm
a hi empl gr
b add insur
c 45> years
d lo empl gr
e risk drink
f live alone
g smoking
h alt ther>5
i med >4
j hospitalisation
PF
RP
BP
GH
VT
SF
RE
MH
PCS
SF-36 DIMENSION

The graphical presentation of these results with the SF–36 profile of scores demonstrates the health status for the ten employee sub-groups from the study population in relation to the SF–36 profile for the Australian employed persons sub-group.

4.14 Qualitative data written on the survey instrument

Of the 514 surveys returned, fifty-one respondents (i.e. 10%) wrote unsolicited commentaries on the survey forms. The nature of these comments varied, and although qualitative data was not sought in this part of the research project, some of the issues that the respondents highlighted are noteworthy. The comments fell into two categories: the first dealing with the nature of the SF–36 survey, and the second dealing with the specific illnesses that the respondents experienced. These two categories are discussed in turn.

Some comments mentioned that bathing, dressing and other physical activities, like climbing a flight of stairs, were not relevant to a working population. Other issues that were mentioned related to the concepts of aging, fitness and perceived threats to health that were difficult for the participants to separate from the health related concepts that were the focus of the questions in the survey.

The second issue about the SF–36 survey dealt with the timeframe inherent in the survey. The SF–36 asked them about their perception of their health 'over the last four weeks'. Several informants wrote on the SF–36 that if they responded to the survey on any other four week period a different result would be achieved. The informants, when doing this

mentioned personal matters in their families and home life that affected their health in this variable way.

The second category of comments was concerned with the nature of the illnesses that the informants had in the past or were experiencing at the present time. Some of the health issues were:

- arthritic conditions that limited their mobility or hand functions
- recent cancer surgery and complications of that surgery
- major surgery of other types
- pneumonia
- injuries and their causes
- weight problems
- lack of exercise and fitness levels
- medication for depression
- asthma
- flu

A rigorous systematic approach to obtaining qualitative data about the health of the study population has been undertaken and the results of this qualitative inquiry are presented in the chapter that follows on from this one.