An exploration of modifiable health associated risk factors within a cohort of undergraduate nursing students

Authors

Dr. Christine Purcell RN B AppSc PhD Senior Lecturer School of Nursing and Midwifery (Logan Campus) Griffith University

Email: c.purcell@griffith.edu.au

Telephone: 07 338 21277

Professor Wendy Moyle RN Dip AppSc BN MHSc PhD Professor of Nursing Research Centre for Clinical Practice Innovation Griffith Health Griffith University

Email: W.Moyle@griffith.edu.au

Telephone: 07 373 55526

Dr. Katie Evans RN BA M Lit St PhD Lecturer School of Nursing and Midwifery (Nathan Campus) Griffith University

Email: k.evans@griffith.edu.au
Telephone: 07 373 55249

An exploration of modifiable health associated risk factors within a cohort of

undergraduate nursing students

Abstract

So-called diseases of affluence, otherwise known as 'lifestyle diseases', are attributed

to modifiable risk factors that are influenced by lifestyle and personal behaviour.

Leading by example is an important way for public health principles to be

communicated. In the university context, students of nursing can become aware of

the challenge to integrate and apply health principles in their own life so that they

become responsible health leaders in the community. The aim of this study was to

explore the incidence of a number of behaviour-associated health risk factors within

a group of undergraduate nursing students. Ninety-four students participated in the

study. Seventy-seven students (82%) reported the presence of at least one modifiable

health risk factor. Forty-four percent of respondents were either overweight or

obese. Further research to explore whether a health promoting curriculum

encourages nursing students to internalise/apply health knowledge to their own lives

is recommended. A campaign of public health might be useful within the university

community to educate students about risk factors and healthy living.

Keywords

Risk factors; obesity; body mass index; health behaviours; lifestyle diseases

2

Background

In Australia and other developed countries there is growing evidence that many major causes of disease and death are the result of the so-called diseases of affluence. Such diseases are deemed to be influenced by lifestyle and specific behaviours, and they have come to be known as the 'lifestyle diseases' (Norton 1998). Lifestyle and personal behaviour have long been considered as the major determinants of mortality and morbidity (Fuchs 1999). Being aware of such influences on the disease process may assist people to increase control over, and to improve their health. However, it appears that there is still a lot of work to be done in enabling people to take control of their health as the number of lifestyle diseases continues to increase.

Diseases commonly associated with lifestyle risk factors include cardiovascular disease and diabetes. In 2002, cardiovascular disease was responsible for 50,294 deaths in Australia or 40 per cent of all deaths (AIHW 2004a). In 1998, coronary heart disease was the leading single cause of death, claiming 27,825 lives, and strokes were the second leading cause of death claiming 11,982 lives (AIHW 2004b). The incidence of diabetes is on the increase with the number of adults with diabetes estimated to be around one million Australians (AIHW 2002). This is in spite of the evidence that by maintaining a healthy weight, doing regular exercise, and eating a balanced diet the risk of developing Type 2 diabetes can be reduced (AIHW 2003a).

There are a number of other non-modifiable factors, such as genetics and age that play a role in the aetiology of ill health and disease (Najman & Western 2000). However, it is the modifiable risk factors, such as lifestyle and behaviour that lead

not only to mortality but also to high financial costs to society (McGinnis & Foege 1993). It has been argued for several decades that a change in lifestyle and behaviour may decrease the risk of disease development thereby promoting individual health (Better Health Commission 1986; Fuchs 1999; Rattray, Brunner & Freestone 1996).

Modifiable Health Risk Factors

As indicated previously diseases such as diabetes and cardiovascular disease are influenced by modifiable risk factors that can hasten the disease's onset or intensify the severity of the disease. Modifiable risk factors include the triad of behavioural factors such as excessive alcohol intake, smoking, poor nutrition and physical inactivity. Poor nutrition combined with physical inactivity is in turn associated with obesity. The relationship between obesity and disease has been well documented (Liu & Manson 2001). Although a low to moderate intake of alcohol has been shown to prevent diseases such as heart disease, high intakes of alcohol also increase the risk of disease, such as breast cancer and liver disease (AIHW 2003b). In Australia, in 1998, around 2,000 deaths were directly attributable to alcohol (AIHW 2003b). Cigarette smoking has been acknowledged as the leading cause of preventable illness and death with approximately 18,800 deaths and 136,700 hospital admissions in Australia being attributable to cigarette smoking (AIWH 2003b).

The interactions between these risk factors produce complex modifications to human physiology, which can facilitate the pathogenesis of disease. This process is accelerated when individuals have multiple risk factors for disease. In a recent study the presence of one or more health risk factors in fifty-nine percent (n = 305) of participants with a mean age of thirty-three were found (Sheahan 2000). The risk for

cardiovascular disease rises in the presence of multiple risk factors (Yusuf et al. 1998).

Health promotion and prevention.

Disease prevention has taken the approach of primary, secondary and tertiary prevention and has been influenced by health professionals promoting and educating clients about health. However, there are programs such as the Spectrum Model advocated by the Institute of Medicine, USA (Rattray et al. 1996) that have taken a more broad approach to disease prevention and are concerned with the populations to be targeted by programs. Rattray et. al. (1996) suggest to take a universal approach when the whole population needs to be targeted, a selective approach for populations at risk of a disorder, an indicated approach for individuals at high risk of disease and a transitional approach for populations moving through a life transition who may benefit from being targeted. This study describes students, who could be typified as a transitional group as they are moving from the role of student to that of employee.

Nurses have an active role in the care of people who may benefit from attention given to disease prevention and maintenance. However, it is argued that such an approach relies on nurses being capable of caring for themselves as well as others (Pate et al. 1995; Wells-Federman 1996). Prompting healthy living by example, or 'modelling' healthy behaviour, has been shown to have the potential to assist others to achieve higher levels of health and wellbeing. Borchardt (2000: 29) for example, suggests that if nurses 'look and feel good, as a result of good nutrition, exercise and elimination of unhealthy habits, we place ourselves in a position to advise with conviction'. If nurses do not maintain their own health they might have diminished

influence over clients' health. Nurses need to maintain the many practices that they preach to patients, such as exercise, weight control, healthy nutrition, and smoking cessation if they are to have a positive influence upon their clients.

Studies on nurses' health

In several studies nurses' health has been investigated and compared to the general population. Piazza, Conrad and Wilbur (2001) explored the status of exercise behaviours, physical self-efficacy and perceived health control in a sample of occupational health nurses. They reported participants' mean exercise score was higher than scores from other studies of female activity. Piazza et al. (2001) acknowledged that occupational health nurses were often responsible for promoting health and thus needed to demonstrate the importance of exercise through role modelling.

In the 1980s tobacco usage in the nursing population was often compared with the general population and the outcome being that nurses smoked more than the general population (Adriaanse et al. 1991). A recent UK study (Rowe & Macleod Clarke 2000) described the smoking behaviours of 555 nurses and 263 student nurses and found that 21% of qualified nurses and 46% of students were smokers. The qualified nurses data compares well with 1998 Australian figures of 1 in 5 Australians (22%) aged 14 years and over being regular smokers and 40% being ex-smokers (AIHW 2003b). It is anticipated that the number of regular smokers will decline following the recent introduction of smoke free laws in Australian states. While such laws will have a positive influence on health, the public also look to health professionals for

health guidance. If nurses are maintaining unhealthy habits they may have little influence on clients if they are seen to be ignoring health warnings.

Research investigating nurses' eating patterns found that the participants cited factors such as shift patterns, a lack of shift breaks, and a lack of food choice that prevented them from eating a healthy diet (Faugier et al. 2001). Such factors are seen to influence the rate of obesity in nurses.

The majority of studies exploring the health of nurses have been undertaken in the UK. It is timely that we explore an Australian nursing population health habits. Nurse academics are in a position to influence student nurses and their health behaviour, so it is important that we study students' health behaviour so that we can better influence them to change.

The Study

Purpose

This study set out to investigate the prevalence of modifiable lifestyle-associated health risk factors in a population of students entering a Bachelor of Nursing (BN) program at a South East Queensland Australia university campus. The University Human Research Ethics Committee provided ethical clearance and the principles of informed consent and confidentiality were observed throughout the project. Students were informed that participation was voluntary and that no names were required on the questionnaires.

Methods

Research Design

This descriptive study utilised self-report surveys to explore a range of health parameters in the nursing student population.

Sample and Setting

A convenience sample of first year BN students aged 18 years and over was asked to participate. The campus is a small, 5 year old campus situated in an outer SE QLD district. The district is multicultural with over 160 cultures represented and it supports a large service and manufacturing industry (QLD Government 2005). When compared to Queensland generally, the district has a high number of young families, a mean taxable income \$3, 732, a lower figure than the Queensland average wage, a lower number of persons with a university degree, and a higher rate of unemployment (10.1%). The Queensland Government characterises this as a low socio-economic district (QLD Government 2005).

The campus is isolated from the 'local' shops and alternative food sources, which require a car, to access them; therefore students either bring their own food supply or purchase from the university facilities. There are three campus based food supply facilities. A 'fast food' shop specialises in a mixture of fried foods and also offers sandwiches, salads and non-alcoholic beverages, including soft drinks. A general store sells snack foods such as packets of crisps, sweets and soft drinks. A coffee shop provides a variety of low and high fat foods and beverages but their food prices are at the higher end of the scale making them less attractive to students on low incomes. There are no medical or health services provided on the campus. A

university wide one-week health promotion campaign is conducted annually across the university sites, including this campus.

Data Collection

Data collection occurred during orientation week, which is held prior to the first week of semester studies. This time frame was chosen to ensure the students had not entered a teacher-student relationship with any of the researchers, or been exposed to any university health promotion activities or health teaching. They were in effect 'new' to nursing students, although approximately 30% of participants were either enrolled nurses or personal care assistants. The study was verbally explained in a classroom setting and students volunteered to complete the anonymous questionnaire. Participants who completed the questionnaire placed this in a collection box prior to leaving the room.

Measures

A questionnaire was specifically developed for the study to investigate health indicators. The questionnaire gathered demographic data including age and gender as well as height and weight. From these self-reports, the researchers calculated the body mass index (BMI) of the respondents by using the standard formula; weight in kilograms divided by the square of the height in metres. The BMI is used to classify an individual into weight ranges; an individual with a BMI of 25 or greater is considered to be overweight while a BMI of 30 or above is classified as obesity (Liu & Manson 2001). Cigarette smoking and alcohol use were assessed by a number of questions. Nutritional data was obtained by a 24-hour food recall whereby participants were asked to record all food and beverages, along with the amount they

had consumed, for the previous 24 hrs. Instructions were provided to help participants describe the type and amount of food consumed.

The Godin Leisure Time Activity Questionnaire (Godin & Shephard 1997) was also used to assess leisure time exercise behaviour. The Godin questionnaire is simple to complete and was found to have a reliability rating of 0.85 when used to explore the leisure activity of 306 healthy adults of both sexes (Godin & Shephard 1985). This brief, 4-item scale provides self-reports of activity intensity as strenuous (heart beats rapidly), moderate (not exhausting), and mild (minimal effort) exercise, considering a 7-day period in which the activity was performed for 15 minutes or more. Activity scores are generated by multiplying reported occurrences by 9, 5, and 3 metabolic equivalents (METs), respectively. A total weekly leisure activity score is calculated as the sum. We determined frequency of activity by participant responses to the question, 'Considering a 7-day period (a week), during your leisure time, how often do you engage in any regular activity long enough to work up a sweat (heart beats rapidly)?' with responses being (1) often, (2) sometimes, and (3) never/rarely. Leisure-time physical activity, with a focus on exploring energy expenditure levels above those required for daily living, is argued to provide an accurate portrayal of physical activity in healthy populations (Kriska & Caspersen 1997).

Findings

Demographics

Out of a possible sample of 96 there were 94 students who participated in the study and of these ten (10.6%) were male. This is comparable with the gender balance in the BN program, and the overall student population in the participating university

campus of approximately 70% female and 30% male students. The age of participants ranged from 18 to 55 years (mean = 29). The majority of students entering the nursing program were mature aged; only 23% were less than 20 years of age.

BMI

BMI could not be calculated for six participants (6.3%) who failed to self-report height and weight. Of the remaining cohort (n = 88) BMI's ranged from 16 to 43 (mean = 25). A BMI within the overweight or obese range was calculated for 41% of this group (Table 1). Over 19% were calculated to have a BMI of 30 or above, which meant that they were within the obese range.

Insert Table 1 about here

Food recall

Participants had been asked to recall and record their intake of food and beverages for the 24 hours previous to the data collection. Results obtained from the 24-hour food recall are reported in Table 1. Over 74% of participants reported consuming at least one serving of bread. Nearly 27% had consumed breakfast cereals. Fresh fruit had been consumed by 34% of students and some vegetable consumption was recorded by 54% of participants. Findings also indicated that 30% of participants consumed neither vegetables nor fresh fruit. Almost 40% of participants had consumed foods in the previous 24 hours, which could be identified as 'fast foods'; all with a high fat content. These include hot chips, hamburgers, pies and sausage rolls. Commonly participants reported consuming a combination of fast foods together; for example chips and a hamburger.

Exercise

The Godin Leisure-Time Exercise Questionnaire was used to assess exercise habits in the previous week. Exercise scores ranged from zero to 126 (mean = 26.88). Two students failed to report levels of exercise and they were excluded from the analysis. Participants who recorded scores of 26 and above were regarded to be highly physically active. Approximately 10% of participants reported that they did not perform any leisure-time physical activity in a typical week. Twenty four percent of students (n=22) reported that they never or rarely ever performed leisure-time activity at a level, which causes the heart to beat rapidly or work up a sweat. The data were also examined to determine the number of participants who performed either moderate or strenuous exercise greater than three times per week. Students were deemed to be physically inactive by Godin's criterion if they failed to perform either moderate or strenuous exercise more than three times a week. Using these criteria, 56% (n=53) were found to be physically inactive.

Smoking History

The majority (51%, n= 48) of students reported they had never smoked cigarettes. A further 29.7% (n= 28) reported they had been cigarette smokers in the past, but had now stopped smoking. Nineteen percent (n=18) of participants in this study reported a current smoking habit. Forty four percent of this group (n=8) reported smoking 20 cigarettes or more per day. The number of cigarettes smoked daily ranged from 2 to 30.

Alcohol Consumption

Thirty-nine percent (n=37) of participants reported that they do not currently drink alcohol. Forty-two percent (n= 40) reported drinking one to two glasses of alcohol on some days of the week. A further 14.8% (n=14) reported that they only drink one or two glasses on weekdays but consume greater quantities on the weekends. Participants were also asked to specify the type of alcohol they usually drink. Spirits were the most popular alcoholic drink, their consumption reported by 44.6% (n=42) of participants. One participant self reported drinking eighteen 375ml stubbies of beer in the previous week. Another student who reported drinking more than two drinks most days of the week indicated that he had consumed a bottle (750mls) of whisky over the previous week.

Multiple modifiable risk factors

The data were also examined to determine the numbers of students who displayed multiple modifiable risk factors; factors considered were BMI >25, current smoking, physical inactivity. This analysis could only be performed on eighty-six participants (91%), since self-reports were incomplete for eight students. Thirty five percent (n=33) of these students presented with more than one risk factor. Three (3.1%) displayed all three risk factors.

Discussion

The majority of findings for this student population are similar to the population in general. These findings are not surprising as the sample population were new to nursing and so in effect could be classified as a non-health professional population.

However, this same population in three years will be registered nurses and as a major proportion of their role it will be expected that they will assist and promote health of the clients they care for. It may be that this will be difficult for them to successfully achieve if they cannot promote their own health.

The study findings indicate that the students display a number of lifestyle behaviours that place them at risk for both cardiovascular disease and diabetes. Lifestyle behaviours that increase the risk for these diseases include physical inactivity; poor diet, being overweight or obese, and smoking. The BMI is a recognised indicator for determining morbidity and mortality risk associated with cardiovascular disease and diabetes and a direct relationship has been reported between higher BMI's and the metabolic risk factors for heart disease (Ashton et al. 2001). The proportion of participants in this study who could be determined to be obese (19.1%), are slightly higher than the 2003 Australian Institute of Health and Welfare national estimates of 16% of men and 17% of women are obese, and the overweight (22.3%) proportion is slightly lower than the 2003 national estimates of 42% of men and 25% of women being overweight but not obese (AIHW 2003b).

It is possible that the data obtained in the current study may under-represent the true proportion of overweight and obese participants. In part this may be due to the female gender bias (n=94, 90%) in our study. For example, a greater percentage of males in Australia are overweight (42%), when compared to females (25%) (AIHW 2003b). Furthermore, the study relied on self-reporting of weight and height. A study by Flood et al. (2000) found that self-reporting leads to an under-estimation of weight, especially in heavier subjects. If we assume that study participants under-estimated their weight then the percentage of overweight and obese individuals

reported in this study is very concerning. It signifies a need to establish effective health promotional activities in this population in an attempt to maximise health and lower the risk of disease so that they can provide effective healthy role models for clients. A large percentage of this student population would not present ideal role models for clients and it is also possible that their excessive weight could hamper nursing tasks and place them at an increased occupational risk of work place injuries such as back injuries.

Physical inactivity is a known risk factor for several major diseases common in our society, namely diabetes and cardiovascular disease (Perry et al. 1995; National Heart Foundation 2004). The Godin Leisure time exercise results indicate that there is a need to increase levels of physical activity in this community. Of concern is the number of participants who reported that they do not perform any physical activity (10%, n=9) and 24% (n=22) who do not undertake regular exercise. Furthermore, almost a quarter of all respondents reported that they never exercise at a level high enough to raise their heart rate or work up a sweat.

The National Heart Foundation recommends at least 30 minutes of moderate intensity exercise (e.g. brisk walking) be performed on most or all days of the week (National Heart Foundation 2004). While the Godin tool did not allow a direct determination of this criterion, the researchers did analyse the data to determine how many participants performed moderate or high intensity exercise for at least 15 minutes more than three days a week, and only thirty-nine students (41.4%) met this criteria. This is a further indicator of a high level of physical inactivity in this population. In 1999, it was estimated that 44% of the adult population in Australia

failed to perform physical activity at recommended levels. Thus, our results are similar to the general population but if we want nursing professionals to be appropriate role models then we should aim for nursing students to become more health-conscious throughout the course's progress.

In this study seventy-seven students (82%) displayed at least one modifiable lifestyle risk factor identified by the National Heart Foundation. Physical inactivity was the most commonly occurring (55.3%, n=52) risk factor. Unfortunately in spite of active Government campaigns for Australians to increase physical activity the amount of sufficient physical activity to promote a health benefit is declining (AIHW 2000). Unless health professionals can be encouraged to increase their physical activity it may be difficult for them to encourage others to work towards a goal of healthy living.

The nutritional data survey was conducted mid-week; therefore students recalled their weekday food pattern. Foods that are often considered to be 'empty nutritional foods' such as soft drink consumption was also considered to be high. Furthermore, the majority who reported drinking soft drinks also reported drinking more than one of these beverages in the day. It is argued that these factors are important considering that the mean BMI for this group is within the overweight range.

Fruit and vegetable consumption was low; in fact more students consumed 'fast foods' than had eaten fruit. Although some vegetable consumption was reported by greater than half of the students (54.2%, n=51) this was commonly limited to those vegetables obtained when eating a salad roll or hamburger. Only sixteen students

(17%) indicated that they consumed more than one serving of vegetables over the day of the diet recall. The Cancer Council of Australia (www.cancer.org.au) suggests that poor diet is an important risk factor in the development of many chronic diseases including cardiovascular disease, type 2 diabetes, and various cancers. They suggest that a balanced diet high in fruit and vegetables is beneficial in reducing cancer risk and therefore it can be assumed that these students may be placing their health at risk.

Sixty one percent (n=57) of participants reported regular alcohol consumption. These statistics are slightly higher than the general population. Estimates of alcohol consumption in Australia have remained fairly consistent during the 1990's. The 1998 National Drug Strategy Household Surveys (NDSHS) indicated that 59% of the adult population in Australia regularly drink alcohol. The group of nursing students we studied reported that spirits were the most frequently consumed alcoholic beverage, a somewhat surprising finding given that they hailed from predominantly low socio-economic areas, and that the price of spirits is higher than beer. The gender bias of the cohort might be reflected in this finding, as females are more likely to drink spirits than males (AIHW 1998).

Fifty one percent (n= 48) of surveyed students reported they had never smoked. This figure is similar to a study conducted in 1995 that demonstrated 51% of adults living in urban Australia had never smoked (AIHW 1998). Nineteen percent of participants (n=19) in this study reported a current smoking habit. This is similar to the NDSHS estimate that 22% of the adult population of Australia were regularly smoking cigarettes in 1998. Eight students (8.5%) reported smoking at least 20 cigarettes per

day; this figure is also similar to 1998 data indicating that eight percent of the adult population in Australia smoked more than 20 per day (AIHW 1998). Although the State of Queensland has instigated one of the most significant anti-smoking reforms in Australia (Qld Health 2005) these reforms centre on pubs and clubs and therefore smokers are still able to smoke within the University grounds. Such reforms should assist to reduce the prevalence of smoking, but the present cohort reflects average Australian smoking patterns.

Strengths and limitations

This study was conducted as a pilot study and was part of a broader study designed to explore a number of health parameters in this convenience sample. The nature of the sample limits the generalisability of the results. Secondly, the data collection relied on self-reports and the inaccuracies obtained with this type of tool are recognised and discussed in this paper. Despite these limitations, it is argued that the results highlight a population at risk of developing major lifestyle disease states, namely cardiovascular disease and diabetes. Furthermore the findings suggest a need for effective intervention strategies directed towards improving the health outcomes for a population of university students within a classified low socio-economic area and a population who have the potential to influence the future health of our nation during the provision of health care.

Nurses have an important role to play in health promotion and illness prevention and positive role modelling may assist them to achieve this. However, it would be difficult at this beginning point of their career for the majority of this group of student nurses to present a picture of health, or to act as a healthy role model to

patients, when their appearance suggests they are overweight, inactive and furthermore they may smell of tobacco. To help change the position of unhealthy role models nurse academics also need to model positive lifestyles to students. Nursing curriculum and university activities might incorporate health promotion activities such as exercise programs and nutritional advice (Underwood 1998). Furthermore universities might institute for staff and students' health promotion programs informed by the Ottawa Charter (WHO 1986).

Conclusion

Participants were based on a campus where the dominant food source was fried fast food and the campus was isolated from alternative food supplies without a significant car ride. The nearest food supply off-campus was a local hotel where the fare was typical of many Australian hotels, including pies and fried foods. The main focus of university is on student learning and this also provides the opportunity to promote health. The University might acknowledge a role in building healthy public policy by making available a variety of low fat and healthier foods and services, healthier public services and cleaner more enjoyable environments. Creating a supportive health need not be separate from other social and environmental goals. Thus, the university might work with health faculties to develop a long-term health plan in conjunction with students and staff to encourage positive changes to modifiable health associated risk factors.

To assist with this community action needs to be strengthened. For example, health promotion needs to work through concrete and effective community action in setting priorities, making decisions, planning strategies and implementing them to achieve

better health. At the heart of this process is the empowerment of communities, their ownership and control of their future.

This group of students is a special community and they are also potential leaders in health. The fact that they come from disadvantaged backgrounds influences their access to health and affordability. They are more likely to be at risk of lifestyle diseases and require targeted promotion campaigns to inform, educate, support and motivate them to change their behaviour. Finally, these students need to be supported to develop personal skills to support personal and social development through providing information and education for health and enhancing life skills. Enabling people to learn throughout life, to prepare themselves for all of its stages and to cope with chronic illness and injuries is essential. This has to be facilitated in school, university, home, work and community settings. Action is required through educational, professional, commercial and voluntary bodies, and within the institutions themselves. This means that universities must enable students to access healthy food choices and to assist them to develop and live healthy lives. Future research to explore whether a health-promoting curriculum encourages students to internalise/apply health knowledge to their own lives is required.

Acknowledgements

The authors wish to thank the students who participated and Mr Greg Iselin for his statistical assistance.

References

Adriaanse H, Reek J V, Sandbelt L & Evers G (1991) 'Nurses smoking worldwide: A review of 73 surveys on nurses' tobacco consumption in 21 countries in the period 1959-1988' International Journal of Nursing Studies, 28: 361-375.

Ashton W, Nanchahal K & Wood D (2001) 'Body mass index and metabolic risk factors for coronary heart disease in women' European Heart Journal 22: 46-55.

Australian Institute of Health and Welfare (AIHW) (2004a) 'The relationship between overweight, obesity and cardiovascular disease' (AIHW Catalogue No. CVD 29) Canberra: AIHW (Cardiovascular Disease Series No. 23).

Australian Institute of Health and Welfare (AIHW) (2004b) 'Heart, stroke and vascular diseases: Australian facts 2004' (AIHW Catalogue No. CVD 27). Canberra: AIHW (Cardiovascular Disease Series No. 22).

Australian Institute of Health and Welfare (AIHW) (2003a) 'Statistics on drug use in Australia 2002' (AIHW Catalogue No. PHE 43) Canberra: AIHW (Drug Statistics Series No. 12).

Australian Institute of Health and Welfare (AIHW), (2003b) *Over 3 million Australians in battle of bulge* Available at www.aihw.gov.au/mediacentre/2003/mr20030912.cfm [accessed 25 June 2005]

Australian Institute of Health and Welfare (AIHW) (2002) 'Diabetes: Australian Facts 2002' (AIHW Catalogue No. CVD 20). Canberra: AIHW (Diabetes Series No. 3).

Australian Institute of Health and Welfare (AIHW) (2000) 'Physical activity patterns of Australian adults. Results of the 1999 national physical activity survey' Canberra: AIHW (AIHW Catalogue No. CVD 10).

Australian Institute of Health and Welfare (AIHW), (1998) 'National Drug Strategy Household Survey: Detailed Findings' (AIHW Catalogue No. PHE 27) Canberra: AIHW (Drug Statistics Series No. 6).

Better Health Commission (1986). 'Looking forward to better health: Final report' (Vol. No.1) Canberra: Australian Government Publishing Service.

Borchardt G L (2000) 'Role models for health promotion: The challenge for nurses' Nursing Forum 35 (3): 29-32.

Cancer Council Australia (2005) *Nutrition and physical activity*. Available at www.cancer.org.au [accessed 16 October 2005].

Faugier J, Lancaster J, Pickles D & Dobson K (2001) 'Barriers to healthy eating in the nursing profession: Part 1' Nursing Standard 15 (36): 33-36.

Flood V, Webb K, Lazarus R & Pang G (2000) Use of self-report to monitor

overweight and obesity populations: Some issues for consideration' Australian and New Zealand Journal of Public Health 24: 96-99.

Fuchs V R (1999) 'Who Shall Live?: Health, Economics and Social Choice' (Expanded Edition) pp. 9-29, River Ridge, NJ: World Scientific.

Godin G & Shephard R J (1985) 'A simple method to assess exercise behavior in the community' Canadian Journal of Applied Sport Sciences 10: 141- 146.

Godin G & Shephard R J (1997) 'A Collection of Physical Activity Questionnaires for Health-Related Research' Medicine & Science in Sports & Exercise 29 (6): Supplement 36-38.

Kriska A M & Caspersen C J (Eds) (1997) 'Introduction to a collection of physical activity questionnaires for health-related research' Medicine and Science in Sports and Exercise 29: 55-59.

Liu S & Manson J E (2001) 'What is the optimal weight for cardiovascular health: Debate about the cut offs for overweight and obesity should not obscure need for population strategy' British Medical Journal 322:631-632.

McGinnis J M & Foege W H (1993) 'Actual causes of death in the United States' Journal of American Medical Association 270: 2207-2212.

Najman J & Western J (eds) (2000) 'A Sociology of Australian Society' 3rd Edition, Melbourne: Macmillan.

National Heart Foundation of Australia (2004) *Healthy lifestyle: your heart.* Available at www.heartfoundation.com.au [accessed 25 June 2005].

Norton L (1998) 'Health promotion and health education: what role should the nurse adopt in practice?' Journal of Advanced Nursing 28 (6): 1269-1275.

Pate R, Pratt M, Blair S, Haskell W, Macera C, Bouchard C, Buchner D, Ettinger W, Heath G & King A (1995) 'Physical activity and public health: A recommendation from the Centres for Disease Control and Prevention and the American College of Sports Medicine' Journal of American Medical Association 273 (5): 402-407.

Perry I J, Wannamethee S G, Walker M K, Thomson A G, Whincup P H & Shaper A G (1995) 'Prospective study of risk factors for development of non-insulin dependent diabetes in middle aged British men' British Medical Journal 310: 560-564.

Piazza J, Conrad K & Wilbur J (2001) 'Exercise behaviour among female occupational health nurses: Influence of self efficacy, perceived health control, and age' AAOHN Journal 49 (2):79-86.

Queensland Government Office of Economic and Statistical Research (2005) 'Local government area profile. The Logan C Region' Brisbane: Queensland Printing.

Queensland Health (2005) *Tobacco Laws*. Available at www.health.qld.gov.au/atods/tobaccolaws/eating/indoors.asp [accessed 16 October 2005].

Rattray R, Brunner W & Freestone J (1996) *The new spectrum of prevention: A model for new public health. Contra Costa Health Services.* Available at www.cchealth.org/topics/publications/pdf/new_spectrum_of_prevention.pdf [accessed 25 June 2005].

Rowe K & Macleod Clarke J (2000) 'The incidence of smoking amongst nurses: A review of the literature' Journal of Advanced Nursing 31: 1046-1053.

Sheahan S L (2000) 'Documentation of health risk and health promotion counselling by emergency department nurse practitioners and physicians' Journal of Nursing Scholarship 32 (3): 245-250.

Underwood P W (1998) 'Breast cancer awareness begins with you' American Journal of Nursing 98 (10): 80.

Wells-Federman C L (1996) 'Awakening the nurse healer within' Holistic Nursing Practice 10 (2): 13-39.

WHO (1986) 'Ottawa Charter for Health Promotion. First International Conference for Health Promotion' November 17-21 1986, Ottawa: Canada.

Yusuf H R, Giles W H, Croft J B, Anda R F & Casper M L (1998) 'Impact of multiple risk factor profiles on determinants of cardiovascular disease risks' Preventative Medicine 27: 1-9.

Table 1: Health Associated Risk Factors

Variable	n	%
BMI		
25-29 (overweight)	21	22.3
> 30 (obese)	18	19.1
Food type		
Bread	70	74.5
Vegetables	51	54
Dairy products	43	46
Soft drink	41	43.6
Fruit	32	34
Cereal	25	26.6
Hot chips	22	23.4
Pasta	20	21.2
Hamburgers	16	17
Pies / sausage rolls	13	13.8
Rice	9	9.5
Eggs	8	8.5
Godin score		
0 = no physical activity of at least 15 minutes	9	9.5
1 - 12 = mild physical activity	15	15.9
13 - 25 = moderate physical activity at least 3 times a week	32	34
> 26 = strenuous physical activity greater than 3 times a week	36	38.2
Smoking		
Never smoked	48	51
Former smoker	28	29.7
Current smoker	18	19.1
Alcohol consumption		
Don't drink	37	39.3
1 or 2 drinks everyday	2	2.1
1 or 2 drinks some days	40	42.5
More than 2 drinks most days	1	1.0
1 or 2 drinks on weekdays but more on weekends	14	14.8
Type of alcohol		
Spirits	42	44.6
Wine	27	28.7
Beer	16	17
Fortified wines	3	3.1
Risk factors		

Physical inactivity + BMI > 25	20	21.3
Physical inactivity + current smoking	5	5.3
Physical inactivity + BMI > 25 + current smoking	3	3.1
Current smoking + BMI > 25	2	2.1