CHAPTER 1

<u>INTRODUCTION</u>

1.0   Overview

Traditionally the study of health and health behaviours has been the domain of mainstream medical researchers. More recently research in this area has encompassed the fields of sociology, psychology and education. Psychology and other health related disciplines have focussed on health behaviours in general and on factors underlying health behaviours in particular (e.g., Winett, 1985; Glanz, et al., 1990; McLeroy, et al., 1993; Adler & Matthews, 1994). Despite the contemporary relevance of research in this area, there has been some confusion in relation to the applicability of findings across gender divide. It has been generally accepted that gender is a factor in the study of the interrelationship between health and health behaviours. Verbrugge (1979), for example, has stressed that both physical and psychological health may be related to gender patterns because women and men may have different behavioural factors. For Verbrugge, these factors relate to illness behaviour, inherent vulnerabilities to disease, and physical risks of illness that influence health and disease. In relation to gender and health behaviours, other researchers have found that women are generally less likely to smoke, engage in regular exercise, and more likely to monitor their diet (Waldron 1988).

Therefore, there is a need to investigate specific aspects of women's health and health behaviours in relation to women. Some studies have been undertaken in this area but there have been inconclusive results. There are policy reasons too for undertaking research on women's health and health behaviours. Women are under-represented in official statistics on health and health care (Oakley & Oakley 1979; Nissel 1980).

Findings based on male subjects rather than female subjects are then generalised to the whole population (Levy & Richey, 1988). Some clinicians even regard a healthy male as synonymous with a healthy adult (Broverman et al., 1970). This belief of taking men as a standard of health may have a detrimental effect on science, theory, public policy, and health of the male and female populations.

The present study was focussed on women's health, (physical and psychological), with respect to three specific health behaviours - smoking, exercise and dietary habits. This was done to offer some definite perspectives on the interrelationships between women's health and in particular to health behaviours. The study was also directed to the importance of adopting women as a separate entity from men in the study of health behaviours. This current study was conceived and undertaken in this context.

At the outset, it is important to define health. Health is a concept which is sometimes difficult to define precisely. This is because the concept of health incorporates issues which are complex and cannot always be expressed precisely. It should be stressed that health is not simply the absence of disease. It is possible for an individual to have a disease and yet manifest no signs affecting his or her health (Di Matteo, 1991, p.120-122). It is also possible to have no disease and yet not be healthy. The World Health Organisation has shown awareness of the broad parameters of health by defining health as a complete physical, mental and social well-being, not merely the absence of disease or infirmity (cited in Wiesner, 1992, p.1).

Perceptions of health vary among groups of people. For some people health is an end in itself. To some groups of people health is mechanical state where the human body is perceived as a machine and the appropriate technique is called for to correct any mechanical failure. Other people perceive of health, health behaviour and health status as the outcomes of social and economic forces. Generally, health can be conceptualized as a resource for everyday life, though not the object of living. Health is a positive concept which comprises the social and personal resources available to individuals, as well as individuals' personal characteristics and capabilities.

When attempting to define health, it is important to have an understanding of what the basic requirements for positive health are. Amongst other things, it is generally agreed that some of the fundamental requirements are suitable diet, exercise, avoidance of smoking and healthy environment. To an individual, good health signifies better quality of life and less sickness and disability (Wiesner, 1992).

An individual's health, and his or her health behaviours are inter-related. Health behaviours have been defined as activities undertaken by the individual believing himself or herself to be healthy for the purpose of preventing disease or for detecting it at an asymptomatic stage (Kasl & Cobb, 1966). That this definition demonstrates the limits to the range of behaviours has been acknowledged. It has however, been pointed out that there are several limitations to this definition, including the omission of lay or self-defined health behaviours. The limitations also pertain to health behaviours of individuals with the specific illnesses that are directed at self-management. These observations were based on the study of a variety of health behaviours including medical service usage and self directed health behaviours. among the latter health behaviours were diet, exercise, smoking, and alcohol consumption (Conner & Norman, 1996, p.2).

A number of health models, which relate detrimental health to specific causes, have been used to study health behaviours. The more influential models adopted for recent research into health and health behaviours are the Biomedical Model, the Psychosomatic Model, and the Biopsychosocial Model. The Biopsychosocial Model has been helpful in highlighting and comprehending some of the more important issues of health and health behaviours. The concept and dimensions of health as proposed by the Biopsychosocial Model have helped create a role for Psychologists in the area of health. Psychological researchers who have used the Biopsychosocial Model in the areas of Psychosomatic Medicine, Behavioural Medicine, and Health Psychology have increasingly contributed to the better understanding of health and health-related factors and identifying the context of good health. Of these classes of researchers, Health Psychology has come to establish an expansive field of inquiry and findings, and has attracted a wide following among psychologists. Health Psychologists apply

the principles of Psychology to the enhancement of good health, the identification of health-risk factors, and the prevention and treatment of illness (Brannon & Feist, 1992; Matarazzo, 1980).

The fundamental claim of Health Psychologists is that a person's lifestyle is one of the major factors influencing health. Lalonde (1975, cited in Sheridan & Radmacher, 1992) defines life-style as a composite of health-related behaviours that are controlled by an individual. Life-style, or the cluster of health behaviours, is said to play an important role in promoting health and in preventing disease. Some examples of life-style or health behaviours are nutrition intake, smoking, and exercise. It has been claimed that people whose diet includes foods that are low in saturated fat, and includes more vegetables and fruits, and more wholegrain and cereals are healthier than those whose diet includes high saturated fats, fewer vegetables and fruits, and less wholegrain and cereals (e.g., Sheridan & Radmacher, 1992).

It has increasingly come to be recognized that an individual can make a significant contribution to his or her own health and well-being by adopting particular health enhancing behaviours such as exercise. Individuals can also significantly contribute to their health through the avoidance of health-compromising behaviours such as smoking and consumption of high fat diets.

Medical researchers have conclusively determined that smoking is a detrimental health behaviour, while exercise enhances good health. Smoking has been identified by the United States Department of Health and Human Services as being responsible for more than 30,000 deaths each year (USDHHS, 1989). On the other hand, exercise is a behaviour which has been associated with health. People who engage in regular exercise are more likely to be more healthy than those who do not engage in exercise (American College of Sports Medicine, 1991; DeVries, 1980; Smith, 1988).

The study of life-style, by Health Psychologists, as being directly related to detrimental or good health takes into account the psychological input in determining which one or more of a set of health behaviours an individual will decide upon in

shaping his or her life-style. The psychological influences on a person's life-style will also depend on that person's state of psychological health. For Health Psychologists, therefore, physical and psychological health are inter-related. In common with Health Psychologists, researchers in Psychosomatic Medicine also claim that physical health and psychological health are directly correlated. That being so, psychological problems experienced by people have an adverse impact on physical health.

Given the role of health behaviours in promoting good health, researchers in the field of Health Psychology have attempted to identify factors which would encourage people to adopt good health behaviours. Three of such factors identified are, Self-Efficacy, Health Beliefs, and Health Locus of Control. Bandura (1982) has pointed out that Self-Efficacy determines the degree to which we are likely to engage in certain behaviours. He has argued that the more the Self-Efficacy or, in other words, the more the degree to which people believe that they will be able to carry out certain behaviour, the more the possibility that they will engage in that behaviour.

Another group of factors identified as influencing health-related behaviours are the health beliefs of an individual (e.g., Becker, 1974). The Health Belief Model focusses on two aspects of an individual's representation of health and health-behaviour - threat perception and behavioural evaluation. Behavioural evaluation in the Health Belief Model comprises two separate sets of beliefs. One set concerns the benefit or efficacy of a recommended health behaviour; the other accounts for the costs of, or barriers to, adopting the behaviour. The parameters of the Health Belief Model was later expanded to include an individual's general health motivation (Becker, et al. 1977a). Like Self-Efficacy and the Health Belief Model, Health Locus of Control has also been used by researchers to study health behaviours. It has been found that people who have Internal Locus of Control are more likely to engage in good health behaviours than those who have External Locus of Control or Chance Locus of Control (Wallston & Wallston, 1978).

In the light of the framework identified in the preceding paragraphs, the present study is directed to examine the extent to which Self-efficacy, Health Beliefs, and Health

Locus of Control are predictors of compliance with health behaviours such as smoking, dietary habits, and exercise over a period of three months. The study also aims to examine if the modification of these life-style factors, that is, smoking, diet, and exercise, helps to improve health and reduce further health problems.

The theories and models selected for the purpose of investigation in this study are the Health Belief Model (Rosenstock, 1966; Janz & Becker, 1984), Self-Efficacy (Bandura, 1977a, 1986), and Multidimensional Health Locus of Control (Wallston, Maides & Wallston, 1976; Wallston, Wallston & DeVellis, 1978). In addition to these theories and models the Psychological Health (Goldberg, 1972), and Physical Health Scale (Greenberg, 1981) are also included in the present study.

DESIGN

This study was conducted over a period of 3 months. The subjects were required to fill in questionnaires on three different occasions refered to as Time 1, Time 2, and Time 3 respectively. The availability of women subjects determined the size of the sample. Out of 114 subjects at Time 1, 86 subjects returned Time 2 questionnaires which led to a further reduction of the sample size to 81 at Time 3. The age - group of the subjects ranged from 19 to 59 years.

The participants in this study were asked to complete questionnaires designed to assess their Health (both physical and psychological), Health Beliefs, Health Locus of Control, and Self-Efficacy, as well as, their Smoking, Exercise, and Dietary habits. In addition, participants were given some information on the relationship between healthy behaviours and good health.

2.0) Health Behaviours and Physical and Psychological Health

This section is directed at explaining and analysing the concepts of Health and Health Behaviours and showing the relationship between Health Behaviours on the one hand, and Physical and Psychological health on the other. The definition of Health highlighted in the 'Overview' recognises the multifaceted nature of Health which comprises various components and perspectives. While all of these components and perspectives can be explored individually and in conjunction with each other, researchers in Psychology have made two broad divisions - Physical Health and Psychological Health. Physical Health can generally be defined as, a state of being which is free from physical disease or illness; it has reference to the body as opposed to the mind. Psychological Health focuses on the personal experience of general well-being. Individuals who feel well are considered healthy. Those who feel distressed or not as ease are considered ill.

Health Behaviours impact on both Physical and Psychological Health. A functional definition of Health Behaviour has been offered by Kasl and Cobb (1966). They defined Health Behaviour as "Any activity undertaken by a person believing himself to be healthy, for the purpose of preventing disease or detecting it in an asymptomatic stage" (cited by Conner & Norman,1996 p. 2). However, it appears that Kasl and Cobb have presented the concept of Health Behaviours as covering only those behaviours undertaken by healthy persons to keep on being healthy. Obviously, there could be a whole range of other behaviours persued by individuals which are connected with health. These would include behaviours relating to smoking, alcohol consumption, dietary habits, medical aids directed at the control of diseases such as diabeties, cardiovascular diseases, and hypertension. The approach to health behaviours that is taken in the present study is this latter broader concept of health behaviours that has been adopted by researchers subsequent to the concept of health behaviours projected by Kasl and Cobb.

As foreshadowed in the 'Overview', Health Behaviours and many life-style patterns are considered to be important in maintaining high levels of health of an individual.

Health-related behaviours, such as smoking, diet, and exercise are considered as major modifiable risk factors in health problems (Alexander & LaRosa, 1994; Blumenthal & Emery, 1988; Siegal et al., 1988; Tonkin, 1988; King & Remenyi, 1986). It is widely accepted that beliefs and attributions that people hold can influence their health by affecting their behaviour.

Three important Health Behaviours which influence both the Physical and Psychological Health of individuals are Smoking, Diet, and Exercise. Each of these Health Behaviours and their impact on Health is briefly considered in the following sections.

2.1) Smoking and Health

Jenkins (1988) reported smoking to be the major preventable health risk behaviour for heart disease and lung cancer. Smoking also entails other health consequences such as coronary arteries, increased blood carbon dioxide levels, decreased oxygen carrying capacity of the blood, and increased potential for blood clotting. In his study, Jenkins found that men who smoke more than 20 cigarettes a day have two to three times the risk of experiencing a major cardiac episode, including sudden cardiac death, than those who do not smoke. Health risks generated by smoking are reduced after quitting this habit. It has been found that after one year of smoking cessation it was noticed that cardiac risk decreases by 50%, and after ten years of quitting smoking the risk of having a heart problem due to smoking is almost eliminated (Tonkins, 1988). Given this finding, more importance should be attached to encourage individuals to quit smoking and promote good health behaviour.

Data revealed by researchers, have shown that lung cancers was among the major cause of death among males and females during 1985 to 1989 (Giles, Hill, & Silver, 1991). This increase in lung cancer is mainly caused by cigarette smoking and statistics show that it is one of the major causes of lung cancer in women. It is more so in women who smoke cigarettes with high tar content. The increased death rates

from lung cancer have been observed among urban populations as compared to the rural population. Smoking is also related to other health behaviours that has an adverse effect on health (Morabia & Wynder, 1990) such as intake of high fat diet and alcohol, and decrease in physical activity (Klesges, Eck, Isbell, Fulliton, & Hanson, 1990; Marks et al., 1991).

In a 24-hour dietary recall, data showed that smokers tend to consume less healthy diets than non-smokers. It was noted that smokers consumed more energy, fat, alcohol, and caffeine than non-smokers. Smoking status was inversely associated with intake of vitamins A and C, dietary fibre, folate, and iron among women. This relationship was more so in women who smoked, consumed fewer vegetables and fruits than non smokers. This trend was however not noticed in men. The results concluded that health promotion messages targeted at smokers should also include dietary instructions, specially for women (McPhillips, Eaton, Gans, Derby, Lasater, McKenney, & Carleton, 1994; Larkin, Basiotis, Riddick, Skyes, & Pao, 1990).

It is true that there has been a decline in death rates from strokes and heart disease since 1950's, but other rates of death have increased. For example, the rate of lung cancer as a cause of death for women has increased in recent years, and compared with other countries, Australian men and women die at a younger age than their counterparts in Greece, Japan, Netherlands, Norway, and Sweden (NSW Department of Health, 1984). A survey revealed that on an average, the daily tar content consumed by women smokers was 157mg and for the men it was about 204 mg. The occupational and educational status were inversely related to the prevalence of smoking (Hill, White, & Gray, 1991). Recent surveys carried out by National Heart Foundation of Australia and World Health Organization have also stated that cigarette smoking is the major risk factor in the onset of disease like asthma and cardiovascular disorders and other serious illnesses. Given the pervasive impact of smoking on health of individuals and the importance of Health Behaviours in relation to smoking, it is not surprising that researchers in Psychology have attempted to study smoking behaviours in terms of predictors of this behaviour.

The tar content of cigarettes is also important in health behavioural status, as a separate variable, because it has a variable impact on the the short and long term health risks. For example, Auerbach, Hammond, and Garfinkel (1979) performed autopsy of two groups of smokers. They found that those smokers who would have taken low tar cigarettes did not show any pre-cancerous histological abnormalities unlike those smokers who had high nicotine and tar yield. Their study showed that there is a relationship between cigarette smoking and the level of tar content.

2.2) Diet and Health

Research has revealed that the percentage of people who are overly fat has increased. This increase in the overly fat people is due to the increase in the consumption of saturated fats and intake of more calories. This consumption of high calories and fats lead to obesity if people do not tend to burn the calories through exercise or metabolism. Further this accumulation of fats leads to various diseases affecting the heart (Gortmaker, Dietz, Sobol, & Wehler, 1987; Logue, 1991; Zaldivar, 1993). Statistics reveals that the tendency to increase weight increases in men till the age of 50, whereas females prevalence rate increases in later age (Miller & Stephens, 1987).

More recent studies have shown the adverse effects fats have on the vulnerability of an individual in cardiac arrythemia (McLennan, Abeywardena, & Chamock, (1990). Miller and his associates, found in their study that fat consumption could cause blood coagulation. They reported that fat intake was associated with factor V11 coagulant activity, which is a predictor of coronary heart disease. Further, they suggested that intake of high fat diet may enhance the chances of coronary thrombosis (1989).

Researches have also shown that high fat content in diet can be a major cause of various kinds of cancer and coronary heart disease (CHD). Sometimes high fat content in diet may not directly cause coronary heart disease, but may affect coronary heart disease risk indirectly (WHO, 1990; National Research Council, 1989). Haines,

Patterson, Rayner, and Hyland (1992) conducted a research on the prevention of cardiovascular disease (CVD). They stated that dietary advice should be tailored to the patient's current diet. They also suggested that apart from the role of exercise in the prevention of CVD intake of considerable amount of vegetables and fruits helps in reducing the risk of CVD.

Another study relating to diet and health was conducted by Anderson, Smith, and Gustafson (1994). In their study, they found that high fibre (wholegrains & cereal) intakes and intake of fruits and vegetables were associated with lower serum cholesterol concentrations, lower risk of coronary heart disease, reduced blood pressure, enhanced weight control, and reduced risk of certain forms of cancer. The National Heart Foundation also concluded accordingly (1992a). Apart from this preventive aspect it is believed that whole-grain and cereals, and vegetarian diets and fruits are also more beneficial for general health and its maintenance (Nelson, 1989; Dwyer, 1991). Consumption of high fat and low fibre in ones diet is also considered to have detrimental effect on an individuals health in general, and in particular by contributing to the development of cancer of the colon (American Cancer Society, 1992; Council on Scientific Affairs, 1989; Bristol, Emmett, Heaton, & Williamson, 1985; Levy, 1985).

One study was carried out by Steinmetz, Kushi, Bostick, Folson, and Potter (1994), to find the association between the consumption of vegetables and fruits and the risk of colon cancer. The study was carried on 41,837 women aged 55-69 years. The researchers found an inverse association between the intake of vegetables and dietary fiber and the risk of cancer. This study supported previous studies that vegetables and fruits were an important factor in the reduction of various diseases.

Another survey in this regard was carried by Cook and Benton (1993), to find the relationship between dietary habits and mental health. 418 individuals responded to a survey of dietary habits and to the general health questionnaire (GHQ). The results showed that women who reported a large amount of intake of vegetables and fruits in their diet had better mental health as compared to those whose intake of fruits and

vegetables was little, irrespective of their social class and age. However, this difference was not noticed in the sample of men. Therefore, it could be stated that women who have high self esteem would eat lots of vegetables and fruits in order to maintain their physical appearance. It has also been found that increased intake of vitamins and minerals do have a positive effect on the mental health of an individual (Cook & Benton, 1993).

In Britain, Wardle, Marsland, Sheikh, Quinn, et al., (1992), investigated the relationship between eating style, attitudes towards food, and consumption of food. For this study, 846 adolescent school children were studied. Results indicated that restraint, as well as external and emotional eating were associated with different profiles of attitudes and behaviour. Restrained subjects had a higher body weight, more negative attitudes towards food, a lower likelihood of overeating, and a lower overall energy intake. External eaters had a lower body weight, positive attitudes toward food and reported a higher energy intake.

Relationship between dietary habits and health has also been studied in the context of education and intervention programmes. In one study, for example, some researchers carried out a study aimed at reducing sodium and saturated fat intake and studying its impact on the risks of cardiovascular diseases. Ninety-six Black American families with 5th-7th grade education background participated in their study. Fifty subjects acted as the experimental group and forty six as the control group. Those who participated as the experimental group were given 14 consecutive weeks of education sessions. A 2-week food frequency questionnaire and 24-hour recall were also used. At the end of the experiment, post program interview were conducted with one adult per family. Though results showed that program participants reported the reduction in sodium intake in their food, participants had a tendency to quit after the 4th week of the program (Baranowski, Henske, Simons, & Palmer, 1990). This finding suggests that more research needs to be done in making people change their health behaviours that could improve their health in general. It may be noted from the study carried out by the above authors that participants quit after the 4th week. This suggests that in order to make people change their health behaviours special care is

needed in the design of the experimental programs to be employed. The programs need to be less cumbersome. In that way it may be more effective, and beneficial. Health surveys carried out by Ursin et al., (1993), suggested that individuals who were on low fat diet tend to substitute carbohydrate rich foods such as fruits and vegetables for the fat. Therefore, these dietary factors should be considered potential confounders in studies of dietary fats.

Since diet is considered to be an important modifiable risk behaviour in promoting and maintaining health, certain guidelines were laid in 1990 for the public regarding the relationship between diet and health. These guidelines were that a) in order to maintain health, eat a variety of foods that are nutritious, b) consume less amount of fat, high amount of vegetables, fruits, food containing fibre, and plenty of wholegrains and cereals (cited in Peterkin, 1990).

It is evident from the research noted above that dietary fat, vegetables and fruits, and wholegrains and cereals are important determinants of health of an individual. The 1990 guidelines also attest to this position.

2.3) Exercise and Health

The growing knowledge about the lack of exercise as a threat to physical health causing physical dysfunctionality has given an impetus to the research in the area of exercise behaviour and health. It is believed that regular exercise is essential in attaining and maintaning high level of health. During the last ten years exercise has sired a large amount of research (Byer & Shainberg, 1991). The effects of exercise on psychological health have been suggested by researchers like Tuson and Sinyor (1993). These sudies about exercise and its relation with health could be useful in long term establishment of the role exercise plays in the physical and psychological health of an individual.

The impact of exercise on good physical and psychological health has been the subject of a number of studies in recent years. Blair et al., (1989), has studied the effect of treadmill exercise on physical fitness and found that it lowered all-cause mortality in both men and women, with the largest negative impact on cardiovascular diseases. In this study there were statistical adjustments for age, smoking status, cholesterol levels, blood pressure, and blood glucose. Other recent studies in the area of exercise and health have suggested the energy expenditure, recovery pulse and performance as being related to fitness (Blair et al., 1986; Breslow et al., 1990; Feilding, 1982; King et al., 1988).

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It is believed that reasonable level of physical fitness and a graduated exercise is beneficial for recovery from coronary heart attacks at the same time is necessary for the maintenance of good physical and psychological health, and to ensure a normal life expectancy (Stebner, Vernetti, & Gillard, 1972; Davis, 1977; Berstein, 1978; Haskel, 1984; Berger, 1984; Dishman, 1985). Also researchers, for example, Haskel, (1984); Pollock, Wilmore and Fox, (1978); Bahrke and Morgan, (1978); Berger, (1984); Dishman, (1985); Morgan, (1979), reported that participation in exercise results in both physical and psychological well-being.

More recent studies have focussed on specific illnesses, such as migraine headaches. Lockett and Campbell (1992), investigated the effects of exercise on migraines in women. They divided the sample in two groups, one organized as experimental and the other serving as a control group. The experimental group comprised eleven adult females and the control group had nine subjects. The participants were required to participate in a six week exercise program. Participants were measured on a number of variables - headaches, physical fitness, intensity and duration of migraine episodes, pain severity, affective distress associated with the occurence of migraine, and social support. Measures taken were pre-, mid-, and post- exercise program. The results showed that those in the exercise group significantly decreased their pain severity scores, reduced effective distress scores, and reported reduced frequency, intensity, and duration of migraines. Earlier research conducted by Simons, Solbach, Sargent, and Leslie (1986) found similar results. They stated that exercise decreased the

frequency, duration and intensity of tension headaches in women. From the above studies the importance of exercise in reducing both general and specific illness has been established. Which gives an added importance for the present study in exploring the relationship between exercise habits and psychological and physical health of an individual.

The foregoing review of research in the health behaviours gives an understanding into the role health behaviours, in particular, Smoking, Diet, and Exercise, plays in the physical and psychological health of an individual.

3.0) Theories of Health Behaviour

Many different beliefs and attributions have been considered as precursors to health related behaviours. General and specific cognitions, derived from various theoretical models, have been used to predict behaviour in the face of a health threat as well as in response to an illness or its treatment. Strickland (1978) suggests that in an ideal or in an ambiguous situation, an individual's behaviour is predictable from generalised expectencies.

There are a number of psychological theories and models that have been proposed and can be applied to get an understanding of health behaviour. Some of the theories used are cognitive behavioural based. This approach combines stimulus-response and cognitive explanations of human behaviour into a single model. There are two major theories in this regard. These are the social cognitive theory and the value expectancy theory. A number of other models and variables are derived from the social cognitive and value expectancy theories.

The social cognitive theory is attributed to Bandura (Bandura, 1969; 1977a; 1986). Bandura's theory lays emphasis on the role of cognitive factors in the determination of behaviour. Bandura (1986) has suggested that the degree of influence of classical

conditioning, applied behavioural analysis, and cognitive theory on psychological functioning will vary according to the individuals' particular activity and his or her circumstances.

The value expectancy theory, also a cognitive behavioural theory, takes into account the motivational role of a person's expectancy of success that a behaviour will attain a particular goal, as well as the value of the goal itself (Broome, 1989). Thus, an individual's behaviour is predictive from the value of an outcome to his or her, and from the individual's expectation that a specific action that he or she indulges in will result in the outcome (Becker & Maiman, 1975).

Rotter's Social Learning Theory and the Health Belief Model are two examples of value expectancy models used extensively as a means to understanding health behaviours. The Health Belief Model is premised on two aspects of individuals' representations of health behaviour in response to threat of illness. These are perceptions of illness threat and evaluation of behaviours in counteracting this threat.

The concept of health locus of control is derived from Rotter's Social Learning Theory (1954, 1966). Later the concept has been developed and has been used quite extensively to study a wide range of health behaviours and predict change in such behaviours. Among health locus of control scales used by researchers in this regard is the multidimensional health locus of control (MHLC) developed by Wallston et al., (1978). This scale measures expectancy beliefs with respect to health along several dimensions.

Self-efficacy theory originally proposed by Bandura (1977b) forms another basis for inquiry into health behaviour. According to this theory, human motivation and action are assumed to be based, among other factors, on perceived self-efficacy expectancy. Self-efficacy expectancy is the belief that a behaviour is or is not within the control of an individual. Of these models and approaches of explaining health behaviours and predicting change, the Health Belief Model, Health Locus of Control, and Self-

Efficacy have been extensively used by researchers. These models are now examined in more detail.

4.0) HEALTH BELIEF MODEL

The Health Belief Model is focussed on two components of individuals' representations of health and health behaviour. These are threat perception and behavioural evaluation. Of these two components, threat perception is taken to depend on two beliefs, perceived susceptibility to illness and the anticipated severity of the consequences of such illness. Like threat perception, behavioural evaluation comprises two sets of beliefs. These relate to the benefits or efficacy of recommended health behaviours, and those concerning barriers to, or costs of indulging in that behaviour (Sheeran & Abraham, 1996).

The Health Belief Model (HBM) has guided much of the research on the role of social cognitive factors in other health behaviours (Maddux, 1993). It has continued to be the focus of theoretical and research attention in this area (Janz & Becker, 1984). The Health Belief Model was initially developed in 1950's to explain public participation in screening programs (Rosenstock, 1974). This model was also developed to predict behaviour of both acutely and chronically ill patients (Becker, 1974). Since then, researchers have extensively used the HBM to investigate the extent to which it explains compliance with recommended health behaviour. For example, Janz and Becker (1984), reported the use of a wide variety of self-made questionnaires based on HBM.

The Health Belief Model (HBM) hypothesises that health-related action depends upon a number of factors. These are, Susceptibility, Severity, Concern, Benefit and Barriers, and Cues to Action.

Susceptibilty: This factor refers to the subjective perception or likelihood of an individual to contract illness (Janz & Becker, 1984).

Severity: This refers to the perception of the seriousness of the illness or threat to potential health the person would encounter (Janz & Becker, 1984).

Concern: It is another factor of the HBM. The existence of sufficient motivation to make health issues salient is termed as concern (Ransford, 1986). Concern is closely related to, and influenced by, percieved likelihood and seriousness of suffering from illness (Becker, 1974).

Benefits and Barriers: This factor is included in the original HBM model and hypothesises that an individual will follow the recommended health behaviour if s/he sees the particular behaviour as feasible and efficacious, and benefits have been compared to out-come expectations as in Social Cognitive Theory (Rosenstock, Strecher, & Becker, 1988). The out-come may be health status, physical appearance, approval of others, or other consequenses (Bandura, 1977b). Barriers are referred to as a potential negative aspect of the recommended health behaviour. For example, being costly or being time-consuming may act as impediments to undertaking the recommended behaviour.

Cues to Action: Cues to action may be internal such as the perception of a symptom, or acts of dealing with an external source such as a health professional, or response to a health education campaign etc. These kinds of internal and external cues to action will influence a person's health behaviour. Preventative health action, directed at minimising or eliminating symptoms of disease, is influenced by a person's belief that he/she is vulnerable to disease; that the occurance of the disease will have some moderate to severe effect in his/her life; and that the advocated health measures are effective in reducing the susceptibility to, and severity of the disease.

The health belief scale adopted by the HBM vary from simple (e.g., Rundall & Wheeler, 1979; Beck & Lund, 1982) to complex questionnnaires (e.g., Becker,

Maiman, Kirscht, Haefner, & Drachman, 1977b; Weissfeld, Kirscht, & Brock, 1990) directed at measuring the components of health belief. The items relating to health belief are scored as 4-10 point in Likert format. The items may either refer to specific disease or behaviours, or to more general states of concern, seriousness and likelihood of disease or illness. These items used may, for example, include question like: "How Likely is it that you would have bad health in the near and distant future?" "Is it a Concern to you that you would have bad health in the near and distant future?" "How Serious is the possibility that you would have a bad health in the near and distant future?"

In the available health education literature, the HBM is recognised as among the most important theoretical formulations to explain health behaviour. In addition to explaining the relationship between health and health behaviour, the HBM theories also recognise that modification in beliefs is necessary for a change in behaviour. The HBM is also related to psychological theories of decision-making about behaviour under uncertain conditions. With regard to the HBM, it is however recognised that there is a lack of information on how to bridge the gap between theory and practice for actual, specific, and detailed programmatic input to health behaviours contributing to good health.

4.1) Research with Health Belief and Health Behaviour

The Health Belief Model has most frequently been used in studies of numerous health promoting behaviours such as exercise, giving up smoking, and dietary behaviours. Most of these studies however have not adopted a gender divide in their investigation and in the analysis of the results. Health behaviour related to smoking has been the subject of study by Ellickson and Bell (1990), and exercise behaviour has been investigated by Raboniwitz, Melamed, Weisberg, Tal, and Ribak, (1992). More recent studies that have been carried out with the Health Belief Model to predict compliance to various health related behaviours include behaviour relating to weight

loss (Frewen, Schomer, & Dunne 1994), AIDs-related risk behaviour (Zimmerman, & Olson, 1994; Rimberg & Lewis, 1994), participation in mammogramy screening programs (Aiken, West, Woodward, & Reno, 1994; Champian, 1994). All of these studies have found that health beliefs were a significant predictor of the respective health behaviours.

With regard to smoking as part of the spectrum of health behaviours, studies show that there are several factors that predict smoking behaviour. As suggested by Fishbein and Ajzen, (1975) and Ajzen and Fishbein, (1977), future intention to smoke were good predictors of smoking behaviour in a 12-month follow up. But for females, the predictive value of this predictor decreased in a 24-month follow up. This suggested that self-referent labels for smoking behaviour may be useful in the short term, establishing, at the least, some intervention programs for children who are at risk during their adolescent age.

A study conducted by Simon and Das (1984) show a strong positive linear correlation between belief variables and reported likelihood of action. Multiple correlation was found to be .69. This indicated a strong positive relationship between an individual's expectation of gain in taking the recommended health measures, and the likelihood of health action for the prevention and control of veneral disease. Perceived susceptibility to disease and perceived barriers to taking appropriate action are correlated to a certain degree with likelihood of action. The former had a low positive correlation while the latter had a low negative correlation. Only perceived seriousness of the disease did not have a statistically significant relation with the likelihood of health action. Analysis of data in this regard suggested that knowledge about an individual's belief in the efficacy of appropriate action was the most important predictor of the individual's likelihood of health action against the disease. This analysis also showed that beta values were low enough to suggest that their contribution to predicting the likelihood of action is negligible when the perception of benefit is in the regression equation. Correlation coefficients with likelihood of action were significant for perceived susceptibiltiy, barriers, and benefits.

The HBM has been used to study a range of health-related behaviours. Steptoe, Sanderman, and Wardle (1995) collected data from 282 students in the Netherlands on two occasions over a period of one year. The data collected was analysed to find the stability of beliefs associated with health, and also the predictors of the changes in health-related behaviours over a period of, one year. The health related behaviours taken into consideration included smoking, exercise, dietary fat intake, and alcohol consumption. The results showed that the awareness of the risks associated with behaviours, and explicit wishes to modify behaviour patterns, such as giving up smoking, and exercising more, did not predict change from year 1 to year 2. However it was found that health behaviours vary in their stability, and that health beliefs may predict future health behaviour changes.

To determine whether beliefs in the HBM might be useful in discriminating different levels of smoking behaviour, Weinberger and his associates (1981) compared health beliefs of subjects divided into three categories: heavy smokers, moderate smokers, and ex-smokers. Issues relating to severity of health effects were posed by asking subjects questions like, 'why should people quit smoking'. Subjects were also asked to rate their susceptibilty to ill effects on their health as a consequence of smoking, and also the adverse effects on future health as a result of smoking. On computing discriminant analysis two functions were produced. One of those was that the smokers were discriminated from ex-smokers. The other was that the ex-smokers were able to give reasons for quitting smoking, and about the detrimental effect smoking could have on a person's health. Moderate smokers did cite the complications associated with smoking but did not however, consider themselves as susceptible to health disorders. This study concluded that in order to stop smoking it is not only important to know the adverse effects of smoking, or for that matter any other health risk factor, but that one should see himself or herself as personally affected by health risk factors generated by smoking.

Others studies on health behaviour offer evidence that the nature of a particular disease influences the perception of seriousness. Janz and Becker (1984) reported, after reviewing 24 studies, that the strongest predictors were perceived barriers to the

behaviour and the perceived susceptibilty to the condition in question. There are other studies which reveal that the HBM has been a useful model for understanding individuals health-related decision-making.

In a review of 19 studies, barriers and benefits were found to be the most powerful HBM dimensions followed by perceived severity of the individual's condition (Becker and Rosenstock, 1984). These studies investigated dietary compliance to determine the relationship between weight loss as a measure of treatment compliance in obese children, and the belief of their mothers or carers. It was argued that mothers or carers of children may influence children's weight because they may influence the childrens' eating habits directly or indirectly, and thereby influence their weight (Becker et al., 1977a).

In these studies, mothers and carers were asked questions about the concern, susceptibilty and severity regarding children's illness, and about their being overweight. The mother's or carer's concern about the child's health, and beliefs about the susceptibility and severity of his/her illness, were predictive of weight loss in the child after two months. Though the results showed significant relations between health belief and weight loss, correlations were small, and ranged only from .21 to .31. These results then have left a large proportion of the variance in health behaviour unexplained. Later studies have, however, come up with slightly larger correlations.

Contento and Murphy (1990) conducted a 12-month follow-up study to find the relationship between dietary changes and health belief. The results showed that those subjects who reported having made dietary changes were more susceptible to disease, and showed more concern about their health. On discriminant analysis, these subjects also showed perceived benefits to change their dietary habits as predictive of their dietary behaviour change. However, like other studies, as described above, this study also showed relatively low coefficients. This suggests that there may be other factors besides health beliefs that contribute in changing recommended health behaviours.

Langlie (1977) has conducted studies which support the hypothesis that there exits a relationship between health belief and preventive health behaviour. However, this relationship is concerned more with indirect risk factors, and more consistent with preventive health behaviour. Smoking, for example, is a direct risk, while low loading exercise is an indirect risk in the preventive health behaviour group. The 24-item interview which was the basis of Langlie's study focussed on behaviours relating to "cigarette smoking", "overweight/underweight variables", and "regular participation in physical activity" (1977).

For the first two behaviours in Langlie's studies, subjects were asked questions about how serious they thought the impact on health was with respect to smoking cigarettes and being over weight. With respect to the last behaviour, subjects were asked questions about "perceived efficacy". Subjects were divided into two age groups, those aged 65 years and over were put in one group, and those under 65 years formed another group. Analysis was performed separately for the two age groups. Results showed both age categories had a statistically significant relationship between 'seriousness' and smoking, and between 'seriousness' and being 'overweight/underweight'. With regard to physical activity, the "efficacy" variable was significant due to the fact that some senior citizens are unable to perform regular physical activity because of their health status. This study therefore confirmed previous findings that health belief has a predictive value for health behaviours.

There is lot of empirical support for the HBM from studies of preventive health, illness, and sick role behaviours (Bandura, 1977a, 1986; Rosenstock, 1966, 1974). Other studies have also shown the importance of model variables in predicting or explaining health behaviours. (Becker, 1974; Leventhal, Meyer, & Guttman, 1980; Rotter, 1966; Strecher, DeVellis, Becker, & Rosenstock, 1986; Schunk & Carbonari, 1984). However, there is room for further research in the area of health and health behaviours and the variable correlation between the two. Notwithstanding the need for further reasearch in this general area, there is substantial evidence from the research reported in this section that health belief can be a significant predictor of compliance of health behaviour.

5.0) SELF-EFFICACY

Self-efficacy theory forms the basis of one of the more commonly used social cognition models dealing with the determinants of health behaviour. Much of the assumptions and applications of this theory can be traced back to the influential writing of Bandura (1977a) who introduced the concept of perceived self-efficacy in the context of cognitive behaviour modification. A strong sense of personal efficacy has been found to be related to better health, higher achievement and more social integration. An individual who believes in being able to cause an event can conduct a more active and self-determined life course. Self-efficacy reflects an individual's belief in being able to master challenging demands by means of adaptive action. This dimension of a person's behaviour makes a difference in how he or she feels, thinks and acts. Self-efficacy levels can enhance or impair the motivation to act. In this regard, actions are pre-shaped in thought, and people anticipate either optimistic or pessimistic situations in line with their levels of self-efficacy. Self-efficacy also allows people to select varying settings, take stock of their surroundings, or create new situations. Self-efficacy is based on experience and should not be confused with positive illusions or unrealistic optimism (Schwarzer & Fuchs 1996). Self-efficacy can be measured in terms of level or magnitude, strength, and generality (Bandura, 1977a).

Perceived self-efficacy represents the belief that an individual can change hazardous health behaviours by his or her own action (Bandura, 1977b, 1986; Schunk & Carbonari, 1984; Marlatt & Gordon, 1985; Donovan & Marlatt, 1988; Marlatt et al., 1994). Perceived self-efficacy is related to situation-outcome expectancies and action-outcome expectancies. Both of these expectancies and self-efficacy play crucial roles in regard to health behaviours by eliminating detrimental habits and maintaining change, but they play different roles. On the one hand, outcome expectancies are important determinants in the formation of intentions but are not crucial in action control. Self-efficacy, on the other hand, appears to be crucial in both stages of self-regulation and health behaviours. Having chartered these assumptions of perceived self-efficacy, the rest of this section is devoted first, to a

review of studies on self-efficacy in relation to general health behaviours and second, to studies on self-efficacy and smoking, dietary, and exercise habits.

There have been numerous studies devoted to find the validity of the self-efficacy model and an adopted self-efficacy scale in predicting compliance with health-related behaviours. Sherer et al., (1982) developed a self-efficacy scale and tested it on 376 college students. Factor analysis was performed which yielded two sub-scales viz, general self-efficacy and social self-efficacy. Results confirmed the hypothesis that past experiences created a sense of personal mastery for a number of actions. Successes and failures ascribed to these experiences influenced behavioural change of the subjects. Results also showed a positive relationship between the self-efficacy scale and vocational educational, and military successes that established criterion validity. Additionally, the relationships between the self-efficacy sub-scales and other personality measures (HLC, Personal Control, Social Desirability, Ego Strength, Interpersonal Competence, and Self Esteem) provided evidence of construct validity.

Another study in this area was conducted by Tipton and Worthington (1984) to determine the construct validity of the self-efficacy scale. In this study, fifty-seven students participated. Participants were asked to perform a simple self-determination task, target a behavioural self-modification objective (e.g., reducing smoking, weight reduction), and asked, to complete the general self-efficacy scale (GSE). In both tasks, self-determination and self-modification, subjects with high GSE scores augmented more effort, showed more persistence in the face of obstacles and changed more than those who had low scores on the GSE scale. The results confirmed the construct validity of the instrument.

Prior to these studies, Sallis et al., (1988) had developed the self-efficacy scale for health-related diet and exercise behaviours. The sample comprised forty adults, who were interviewed with a view to identifying behavioural and situational components that helped to change dietary and exercise behaviours. The items derived from these subjects were then administered to 171 undergraduate students and university staff. Factor analysis revealed two important exercise self-efficacy factors, and five dietary

self-efficacy factors. The test-retest reliability and internal consistencies of these factors were also examined in this study. Results showed self-efficacy factors to be significant predictors of the exercise and dietary behaviours of the subjects.

More recent studies have attempted to validate two measures of cardiac risk factor self-efficacy. These were the cardiac diet self-efficacy instrument, and the cardiac exercise self-efficacy instrument. The subjects in one of these studies were taken from a cardiac rehabilitation centre. Three hundred and seventy subjects aged 32 to 79 years participated in this study. The factor analysis showed unidimensionality of each scale. The construct validity was supported by comparing the scores of 171 subjects with 54 marathon runners (aged 22-55 years) on the cardiac self-efficacy instrument and the exercise self-efficacy instrument. Results established the predictive value of the cardiac diet self-efficacy instrument and the exercise self-efficacy instrument in predicting exercise and diet performances respectively. The study therefore concluded that self-efficacy scale was an important factor to be used in cardiac rehabilitaion (Hickey, Owen & Froman, 1992).

A recent study conducted by Duncan and McAuley (1993) has concluded that self-efficacy cognitions operated as an arbritation in the relationship between social support and health-promoting behaviours of the population at risk. This conclusion confirms earlier predictions of Bandura (1986) in this regard. In another enquiry comprising of a nine month follow-up study of 82 older adults aged 45 to 65 years, McAuley, Lox, and Duncan (1993) found that exercise self-efficacy predicted adherence to future exercise habits.

The studies just discussed concerned the relationship of self-efficacy to health behaviours and risk factors. Scales to measure self-efficacy were used in those contexts. The next thing to note is that Self-efficacy can be measured in different ways. According to Bandura (1977a) self-efficacy can be measured in terms of both level and strength. Level (magnitude) is a measure of the level of performance of people that they believe that an attainment of a particular behaviour is in their capacity. In the foundation research to test the Self-Efficacy Theory, Bandura,

Adams, and Beyer (1977) used subjects who had snake phobia. The researchers presented these subjects with a hierarchical list of 29 increasingly threatening behaviours involving interaction with a boa constrictor. These behaviours ranged from approaching the snake in a glass case to actually touching it. The level of self-efficacy was taken from the list of the most threatening behaviour the subject thought that she/he would be able to cope with. The subjects were asked to rate those behaviours that they thought they could perform, and also to rate how confident they were in performing that behaviour. The scale consisted of a 100 point scale with 10-point intervals, ranging from 0 to 100 indicating low to high confidence in the behaviour of the subjects. In summing up this study, Bandura (1978) has stated that snake phobias provided a reliable standardized procedure with high experimental control for measuring the relative power of different ways of influencing self-efficacy and behaviour change.

5.1) Research with Self-Efficacy and Health Behaviours

Various studies have endeavoured to relate self-efficacy to specific health behaviours such as smoking, dietary habits, and exercise. This section is directed to highlight the results of those studies with a view to concluding that self-efficacy is a significant predictor of health behaviours.

Among others, DiClemente, Prochaska, and Gibertini (1985) investigated the influence of self-efficacy and the changes of self change in smoking. Sperry and Nicki (1991) manipulated cognitive appraisal and evaluated its effect on self-efficacy as a mediator of cigarette smoking behaviour among 3 groups. The three groups comprised of 26 high self-efficacy (SE), 27 low SE, and 21 control subjects. High self-efficacy subjects received information about concept of SE and its relevance to not smoking, and the low SE subjects obtained information about learning theory determinants of not smoking. This study lasted for 6 weeks. By the end of the sixth week, both the number of cigarettes smoked per week (CPSW) and nicotine intake

per week (NIPW) decreased substantially. Results showed that SE strength was greater for the high SE group, but there was no significant treatment group differences with respect to number of CSPW or NIPW. However, there were significant decreases from baseline to 1-6 month follow up periods for both number of CSPW and NIPW.

Condiotte and Lichtenstein (1981) developed a questionnaire which was later used by Garcia, Schmitz, and Doerfler (1990), to find the relationship between self-efficacy and smoking behaviour. Significant but small correlation was demonstrated between self efficacy for resisting smoking and the number of cigarettes smoked in a four week quit smoking program. Self-efficacy measured before the quit date was not significantly correlated with resisting the urge to smoke in the first 2 weeks. However, self-efficacy taken 2-weeks into the program did correlate with the percentage of a high risk situation in which subjects managed to resist the urge to smoke in the final 2-weeks of the program. It appears that self-efficacy may well have changed by becoming more realistic as the program progressed.

Another study was carried by Carey and Carey (1993) to find changes in self-efficacy resulting from the unaided attempts to quit smoking. Smoking self-efficacy was assessed prior to the self selected quit date and again in twelve months. The quit status was determined at one, six, and twelve months after the quit date. Results showed that the quitters self-efficacy increased, whereas continuous smokers self-efficacy decreased from the time of pre-quit baseline to the twelve month assessment. Also significant drop in the self-efficacy was noted in relapsers. Earlier studies were carried out to evaluate the role of self-efficacy among other social cognitive variables in predicting changes in smoking behaviour. Researchers found that higher self-efficacy was associated with reducing smoking habit in subjects (Devins & Edwards, 1988). Thus supporting the claim that self-efficacy is predictive of health behaviour change in a person.

Borrelli and Mermelstein (1994) studied the role of self-efficacy, motivation, and stress in subgoal setting (SGS), and also the achievement in a smoking cessation

program. They also examined their prediction in achieving abstinence and the relationship of subgoal in achieving this abstinence. The sample comprised of 124 smokers. Results indicated the negative relationship between self efficacy and subgoal setting. However, self-efficacy and prior subgoal were found to be the significant predictors of subgoal achievement over time. Results also confirmed that the self-efficacy level during treatment emerged to be the only significant predictor of abstinence.

In another study involving younger people, the self-efficacy scale was used on 576 students attending school in the 7th grade to find the predictive value of self-efficacy scale in determining future smoking behaviour. Subjects were asked to complete the questionnaire on three different occasions. Statistical analysis revealed the already established pattern of three sub-scales viz, opportunity to smoke, emotional stress, influence of friends or peers. Further, test-retest correlations were computed which confirmed the reliabilty of self-efficacy scale. The scale also showed construct-content and criterion validity, substantiating the usefulness of self-efficacy scale in predicting smoking in young adolescent (Lawrance, 1989).

In addition to smoking behaviour researchers have also studied the correlation between self-efficacy and dietary habits. A number of studies have been conducted to find out the relationship with dieting self-efficacy and weight change in behavioural weight control program (Stotland & Zuroff, 1991; Blair, Booth, Lewis, & Wainwright, 1989). Also studies have been conducted to examine the self-perception and reaction to a dietary challenge, dietary change for cardiovascular disease cardiac diet and self-efficacy (Hickey et al., 1992; Baranowski, 1990; Polivy & Herman, 1991; Toshima, Kaplan, & Ries, 1990). In all these studies self efficacy has been found to play a significant role in determining health behaviour.

Studies on the relationship of self-efficacy to dietary changes have however not always yielded conclusive results. Hertog, Finnegan, Rooney, and Vishwanath (1993), for example, investigated the nature of self-efficacy and its relationship to predictors relating to diet. In this study self-efficacy dimensions were used to design

messages used in community intervention. These were directed to improve a community-based information campaign to help change dietary risk behaviours. Results, however, did not conclusively support a relationship between self-effiacy and diet-related changes. This finding generated more evidence to stress the importance of including Self-efficacy in the Health Belief Model and in public health intervention. Brawley (1993) stated that joint intervention of theories such as Self-Efficacy, Reasoned Action, and Planned Behaviour had more potential influence to enhance exercise behaviour change than any single theory.

In relation to exercise behaviour and self-efficacy, one study was conducted by McAuley and Courneya (1992) on eighty eight sedentary middle aged adults aged 45 to 64 years. They examined the relationship of pre-existing efficacy for exercise with perception of effort expenditure and in task affect during exercise testing. Subjects who had high efficacy had lower perception of effort expenditure. Whereas they reported more positive affect during exercise than did their less efficacious counterparts. Further, affective responses during exercise were significant predictors of post-test self-efficacy.

Other studies have found perceived self-efficacy to be major motivating factor in forming intentions to exercise and maintaing exercise practice for an extended period of time (Weiss et al., 1989; Dzewaltonski et al., 1990; Feltz & Riessinger 1990; McAuley 1992, 1993; Shaw et al., 1992; Weinberg et al., 1992). The role of self-efficacy in initiating and maintaing a programme of regular physical exercise has also been studied by Desharnais et al., (1986), Sallis et al., (1986, 1992), Wurtele and Maddux (1987), Long and Haney (1988), and Fuchs (1995). Endurance in physical exercise was found to be dependent on competitive efficacy by Weinberg et al., (1979, 1980, & 1981).

The review on the studies of self-efficacy and health behaviours has shown that self-efficacy is predictive of intentions and actions in different areas of health functioning. The intention to engage in any specific health behaviours and the actual behaviour generated as a result of that intention are directly associated with an individuals'

beliefs in his or her self-efficacy. The stronger an individual's self-efficacy beliefs the more positive will be their goals and commitments.

Despite the importance of the self-efficacy model some inadequacies of this theory have been highlighted. Rosenstock (1988), for example, has suggested that self-efficacy is only one factor in determining health behaviour. He has argued that health behaviours are also determined by perceptions of health threat seriousness, susceptibilty of illness, barriers, and cost benefits in attaining recommended health behaviour. Despite inadequacies such as those suggested, self-efficacy is still believed to play a role in determining health behaviour.

6.0) HEALTH LOCUS OF CONTROL

Generally, Locus of Control represents an expectancy that an individual's actions are instrumenal to the attainment of goals. Like the self-efficacy theory discussed in the previous section of this thesis, the locus of control theory emphasise the importance of perceptions of control, personal competence, and perceived competence. As a result of studies and research on locus of control, it is now generally assumed that individuals who believe that they have control over their health will more likely to pursue a range of health promoting behaviours (Strickland 1978; Wallston & Wallston 1981) and, consequently have better health status (Seeman & Seeman 1983; Marshall 1991).

Health locus of control (HLC) theory has been extensively applied in health psychology as a predictor of health behaviour. The basis of the HLC theory owes much to the pioneering work of Rotter (1954) in the area of social learning theory. Starting from the fundamental principle of the social learning theory that the liklihood of a behaviour taking place in a particular setting is a function of both the individual's expectancy that the behaviour will lead to a particular reinforcement, and the extent to

which the reinforcement is valued, Rotter (1954) proposed that the theory could operate on two levels - the general, and the specific.

This proposition of Rotter facilitated the introduction of the locus of control notion as a generalised expectancy relating to the perceived relationship between an individual's actions and experienced outcomes. In presenting his perspective in this regard, Rotter proposed a distinction between internal and external locus of control orientations. According to him, 'internals' are seen to believe that events are a consequence of an individual's own actions and thereby under his or her personal control. External's, on the other hand, are seen to believe that events are unrelated to their actions and thereby determined by factors beyond an individual's personal control (Norman and Bennett, 1996).

Moreover people who care about their health are more likely to have internal locus of control as for they feel responsible for their health (Hill, 1978). On the other hand people who are high in external locus of control believe that their lives are controlled by other people and hold those powerful others, or fate, responsible for whatever they do. Moreover internal locus of control has been associated with higher levels of self esteem, lower levels of anxiety, greater assertiveness, and resilience following failure, and has also been associated with sufficient knowledge of disease, (Wallston et al., 1976); ability to quit smoking by Steffy et al., (1970); ability to lose weight (Balch & Ross, 1975). This degree of belief in self determination is measured by Rotter's Internal-External locus of control scale devised by him in 1966.

While Rotter's locus of control scale comprised of internal and external dimensions later locus of control scales are multidimensional. Health Locus of Control is a multidimensional scale with independent beliefs that health is influenced by external factors or what is called 'powerful others'. Health locus of control for them is the that world is an ordered place but is controlled by those who are in a better position or possess strong personalities. Personal behaviour is the other component of health locus of control contruct. It looks at health as dependent upon one's own self and 'chance'. Health locus of control factors that is health of a person, is dependent upon

forces like fate or mere chance, and these people may view the world as unordered (Levenson, 1974; Wallston, Wallston, & De Vellis, 1978). Wallston et al., (1978) found the scale to be reliable and predictive. They also presented the contruct validity of the scale. Later Shipley (1981) also reported the subscale validity and independence of each sub scale. This indicated that this new version of health locus of control scale is a more accurate measure of health related locus of control. Wallston and Wallston (1982) proposed that patterns of scores are used to describe each person's overall locus of control.

Research have been conducted to examine people's locus of control by Internal and External Locus of Control Scale (I-E), or by using scales developed to assess health related locus of control. Despite some recent claims that multidimensional health locus of control (MHLC) does not show high correlations between 'Internal', 'Powerful others' representing 'External Locus of Control', and 'Chance' subscales, Multidimensional Health Locus of Control by Wallston, Wallston, & Devellis (1978) is considered to be the best measures so far. Strickland's (1978) review of a number of early studies demonstrated a positive relationship between internal control of reinforcement and physical health. As Strickland (1978) pointed out, one would expect that 'internals' would seek out health knowledge, be more receptive to health messages and be more active in health related behaviour than 'externals'. In a later study Wallston (1992) has argued that internal health locus of control beliefs tend to show stronger correlation with the performance of preventive health behaviour on a general level, than with specific behaviours

6.1)   Research with Health Locus of Control and Health Behaviour

Studies which have sort to link internal health locus of control beliefs to the performance of preventive health behaviours such as smoking have produced mixed results. It is generally assumed that those smokers who perceived that they have personal control over their health would be more likely to initiate changes and

maintain changes in their smoking behaviour. It is however possible to argue that the initial impetus for change in smoking behaviour comes not from personal control but from health professional advice to change the smoking behaviour. Studies in this regard bear out the truth of these statements.

In their study, Rosen and Shipley (1983) examined self initiated smoking reduction and concluded that internal health locus of control beliefs were important in predicting the maintainenace of successful smoking reduction regimes in individuals. Another study by Shipley (1981) indicates that smokers with an internal health locus of control orientation who attended a smoking cessation program were more likely to successfully quit smoking in six months. While these studies portray an optimistic relationship between internal health locus of control beliefs and smoking related - behaviour change, other studies have not been so conclusive.

In one study, researchers examined three variables viz., health conception, health locus of control, and power as predictors of smoking behaviour change. Of 64 subjects who participated in this study 32 reported to have quit smoking effectively and successfully whereas the other 32 subjects either continued smoking or resumed to smoking after initial attempts to stop smoking. Results indicated that the subjects who were receptive to advice simply had the conception of health as the absence of disease, having the external locus of control over the smoking habit or simply having the elated awareness of the power over the cigarette smoking habit (Segall & Wynd, 1990).

A more recent study by Stuart, Borland, and Murray (1994), examined the role of health locus of control and self-efficacy in predicting smoking cessation of an individual. Two hundred and fifty seven subjects particiapted in a smoking cessation program. The study was carried for six months. Results showed that after six months 207 subjects had made attempts to quit smoking whereas 43 subjects had stopped smoking. Both pre-treatment self-efficacy and health locus of control showed significant relations with an attempt to refrain from smoking. But at post treatment self efficacy came out be the only significant predictor of maintainence of smoking

behaviour. Locus of control did not conclusively show any strong predictive value in determing the smoking behaviour. Suggesting still more work and research required to find the role of health locus of control.

Wojcik (1988) found that individual smokers with 'powerful others' locus of control who attended formal treatment programmes were more likely to relapse to their previous behaviour at three months. The results of these studies tend to suggest that while internal health locus of control beliefs can play a role in smoking related - behaviour change, the influence is not significant enough to draw any decisive conclusions. Similarly with regard to Wojcik (1988) study it can be remarked that while 'powerful others' health locus of control can be a factor in initiating attempts to quit smoking, it is not strong enough to sustain long term cessation of smoking.

As with the studies linking health locus of control beliefs with a smoking behaviour it is possible to argue that dietary habits may be dependent on both 'internal' and 'powerful others' health locus of control. But as with health locus control beliefs and a smoking behaviour studies linking health locus of control with dietary behaviours have proved inconclusive. This is revealed in the studies reviewed here.

It is accepted that over consumption of foods containing fat, sugar, and salt are linked to obesity heart diseases and other ailments (World Health Organization 1982; Shaper, 1988). Health promotion programmes have therefore, been adopted on a national level to encourage the consumption of healthy diet by individuals (Directorate of Welsh Heart Programme 1985; Farquhar et al., 1985; Puska et al., 1985; Department of Health 1992).

Other studies suggests that the health locus of control construct may be useful in predicting some dietary choices at a population level (Booth-Kewley & Friedman, 1987). Issues of health locus of control or the value attached to health may not be substantively correlated to dietary choice at a population level. Norman and Bennett (1996) have concluded that health locus of control construct is a weak predictor even

when its interaction with health value is considered. In reaching this conclusion Norman and Bennet have referred Wallston (1992) and Wurtele et al (1985).

Like studies on the relationship between health locus of control and smoking and dietary behaviours, researchers have also studied the interrelationship between health locus of control and exercise. In one study Slenker et al., (1985) compared the health locus of control beliefs of joggers and non joggers. This study found the joggers to be more internal. In another study Carlson and Petty (1989) found that college students with strong internal health locus of control beliefs were more likely to take part in physical activities involving high calloric expenditure time. O'Connell and Price (1982) established a link between health locus of control and attendance at worksite-fitness programmes. While these studies concluded that there was a strong link between internal health locus of control beliefs and exercise, other studies found either a weak relationship or no relationship between internal health locus of control beliefs and exercise behaviour.

In one such study, Rabinowitz, et al., (1992) investigated the importance of personal determinants of leisure time exercise activities among 37 female and 9 male blue collar workers, aged 17-54 years. The personal determinants studied were self-efficacy, beliefs about the contribution of exercise, health locus of control, and dispositional optimism. The results showed that health beliefs and self efficacy rather than health locus of control came out to be the main predictors of leisure time exercise. Also beliefs and efficacy turned to be highly correlated. Conversely, neither health locus of control nor the dispositional optimism seemed to relate to leisure time exercise. Optimism was related to the positive belief that exercise is a precipitating factor to health. Other studies have concluded on a similar note these include Calnan (1989); Norman, (1990).

The review of studies in this section has shown that number of studies have demonstrated a relatively significant relationship between health locus of control and health related behaviour. But Speake, Cowart, and Pellet, while investigating the health behaviour of a large sample of elderly people, found correlations to be very

small. Internal locus of control was found to be significantly correlated with the positive exercise behaviour, low stress, nutrition, and health responsives but the correlations were as low as 12 (Speake, Cowart, & Pellet, 1989). However, Strickland, (1978), Wallston and Wallston, (1981, 1982), reported mixed findings regarding the role the locus of control plays in determining the health behaviour. The reasons given for this kind of finding may be that the locus of control, together with the lack of specific health locus of control measure, is unsophisticated. Also the use of different instruments and a failure to measure locus of control in the context of health value might have been the reasons for mixed findings (Wallston & Wallston, 1981). Overall, however, health locus of construct have been found to be a weaker predictor of health behaviour.

7.0) Psychological Health and Physical Health

It is generally assumed that health behaviours relating to physical fitness is conducive to an individual's psychological well-being. Psychological health refers to general feelings of psychological well-being whereas physical health refers to the self-report of one's illness and how an individual rates his/her health. It is believed that psychological factors affect all aspects of an individual's health and illness by affecting their health behaviours. More specifically psychological and emotional well-being of an individual is associated with his or her psychiatric and physical condition (Beiser, 1974), anxiety (Warr, 1978) level of cortical arousal, degree of personal relaxation and conscientiousness and general level of physical health (George, 1978).

A number of studies conducted by Bandura and Adams (1977) lend substantial validity to the theory that psychological influences alter defensive behaviour. Similar findings have been reported by Kamen and Seligman (1989); and Lin and Peterson (1990). Other researchers have found significant relationship between physical health and mental illness (Houpt et al., 1980; Verbugge, 1979). Oldenberg, Perkins, and

Andrews (1985) have reported the relationship between psychological health and compliance with recommended health behaviours such as smoking, exercise, and consumption of alcohol. They found that poor psychological health had an adverse effect on the health of the individual and were less conducive to change in health-related risk behaviours.

McCann and Holms (1984) conducted a study on the interrelationship of aerobic exercise, relaxation training on non-clinical depression. The subjects were divided into more than one group and the group that received exercise treatment showed significant improvement in depression scores than those who did not. The depression scores were measured by Beck Depression Inventory.

Doyne et al., (1987), compared the affectiveness of aerobic and non aerobic exercise in the treatment of clinical depression in women. The women were assigned to three conditions on 8 week running aerobic program, a weight lifting non-aerobic program or wait-list control conditions. Results of the study indicated that exercise conditions significantly reduced depression, compared with the wait-list control condition (cited in Bryne & Bryne, 1993),

In a specific study of aerobic exercise and the placebo effect (Desharnais, Levesque, Jobin, Cote, & Godin, 1993) was conducted with 48 healthy young adults engaged in a supervised 10-week exercise program. The thrust of this experiment was to determine whether a placebo effect is involved within the exercise-psychological enhancement connection. The indicator of psychological well-being adopted in this experiment was self-esteem. Self-esteem was measured on four occasions during training program. The results showed that self-esteem was significantly improved over time in the experimental, but not in the control condition. These findings re-inforce the belief that exercise may enhance the psychological well-being.

In a study relating smoking to psychological health, Dhillon & Sexena, (1988) examined the effect of smoking. These researchers also included academic discipline and attitudes towards smoking as an added variable. The study comprised of male

university students with seventy smokers in each groups and thirty non-smokers. Although the study found that smoking behaviour did not significantly effect self-concept, feelings of security and level of anxiety, the results implied that smoking behaviour compared with other variables was responsible for differences in personality between smokers and non-smokers.

Cook and Benton (1993) investigated the relationship between diet and mental health, on a thousand individuals, drawn from Welsh city. This study was directed to assert an association between the consumption of fruit and vegetables and better mental health. It was found that those eating large amounts of fruits and vegetables were less likely to be anxious or depressed. This direct relationship between healthy diet and better mental health was consistent, irrespective of age and the social background of the subject (Cook & Benton, 1993).

It has been pointed out that studies devoted to finding physical fitness and psychological well-being have yielded equivocal results. It has been asserted in this context that researchers claiming a positive interrelationship between exercise treatments and psychological benefits should be interpreted with caution (Bryne & Bryne, 1993).

More generally, other studies, while finding less psychological dysfunctionality consequent to better adherence to healthy life style factors such as smoking, exercise and food habits, have failed to clearly correlate psychological dysfunction and lifestyle (eg., Oldenburg, Perkins, & Andrews, 1985).

Although studies linking issues of health with psychological well-being have not proved totally conclusive they provide a large base to permit experimentations to explore the potential efficacy of healthy health behaviours for the eleviation of psychological symptoms and prevention of distress (eg., Bryne & Bryne, 1993; Morgan & Goldston, 1987 in the context of exercise and psychological health).

8.0) Research on the impact of Information

Campaigns aimed at changing health care behaviour (eg., anti smoking propaganda, campaigns to direct people to have healthy choices about their foods etc.) and efforts for women to check themselves for signs of breast cancer have become quite common. It has also been observed that the style of campaign and communication, influences the people's responses to these campaigns. But the source and the message that is conveyed should also be effective (McGuire, 1968; DeSola-Pool et al., 1973). Mass media seems to be a suitable medium for providing information and knowledge and awareness about health and health related behaviours. However, the perception of the message varies from person to person.

Generally the communicative aspect of health behaviour is attributed to the mass media, pharmacists and physicians who provide information and guidance on health and medicine in positive terms (Sogaard & Fonnebo, 1992; Crossman & Eyjolfsson, 1991; Avis, McKinlay, & Smith, 1990). The information provided has an impact on the health risk behaviours such as smoking, poor dietary habits, and exercise in addition to stress and alcohol consumption (Blumenthal & Emery, 1988; King & Remneyi, 1986; Siegal et al., 1988; Tonkin, 1988).

One study was carried out to determine the importance of communication in reducing diet-related cancer risk (Vishwanath, Kahan, Finnegan, Hertog et al, 1993). The study was carried out on both more educated people and less educated ones to see the role of education as a motivating factor. Results showed that knowledge of the cancer risk was dependent on the education level.

In one study of the smoking behaviour, the subjects comprised of one group of medical students and one group of law students. It was found that the students' knowledge and their opinion of the evidence relating to the hazards of smoking were related to their stage of education, whereas their assessment of the risk was linked with their smoking behaviour. It was suggested that increase of smoking amongst

medical students may have been forestalled by providing information about the hazards as early as possible (Knofp & Wakefield, 1974).

Jackson (1994) studied the effectiveness of different kinds of written-communication interventions to enhance patient adherence to prescribed exercises. The patients in this study, who suffered from back or neck pain, were divided into three groups. Group 1 and group 2 received educational booklets, but the control group received none. The results indicated that the subjects in group 1 and 2 had varying degrees of confidence in the medical advice contained in the supplied booklets. This level of confidence was more stronger than that exhibited by the members of the control group.

In their study of the perceived inadequacy of the patient education (Skelton, Murphy, & O'Dowd, 1995) highlighted the inadequacy of patients education. They drew attention to the inadequacy of the current professional assumption in this regard, and stressed the need for improving patient education. For patients suffering from cardiac disorder the risk factor modification is the main concern in the rehabilitation of these patients, as means to attentuating the disease process. The attempt to change the behaviour starts right from the day the patient is in the coronary care unit. The rehabilitation starts by giving these patients education, which is provided via the media, written material, counselling from nursing staff or physicians (eg., Jeffery, 1988; Murray, 1989).

More complex interventions, other than education, that involve counselling and behavioural techniques have been shown to be more successful in improving compliance and knowlege (Baile & Engel, 1978). Most of these studies have however focussed on male subjects and relatively little data is available on women.

9.0) Objectives of the Present Study

It is useful at this stage, to re-state the context and objectives of the present study. This present study is directed to examine the extent to which Self-efficacy, Health Beliefs, and Health Locus of Control are predictors of compliance with health behaviours such as smoking, dietary habits, and exercise over a period of three months.

As already pointed out in the 'Overview', the theories and models selected for the purpose of investigation in this study are the Health Belief Model (Rosenstock, 1966; Janz & Becker, 1984), Self-Efficacy (Bandura, 1977a, 1986), and Multidimensional Health Locus of Control (Wallston, Maides & Wallston, 1976; Wallston, Wallston & DeVellis, 1978). In addition to these theories and models the Psychological Health Scale (Goldberg, 1972), and Physical Health Scale (Greenberg, 1981) are also included for examination and application in the present study.

The present study focussed on women. There were two reasons for this. One is that Health Behaviour varies by gender. Verbrugge (1979), for example, has stressed that both physical and psychological health may be related to gender patterns because women and men may have different behavioural factors. In relation to gender and health behaviours other researchers have found that women are generally less likely to smoke, engage in regular exercise, and more likely to monitor their diet (Waldron 1988). The other reason for undertaking research on women's health and health behaviours were for the policy reasons. Women are under-represented in official statistics on health and health care (Oakley & Oakley 1979; and Nissel 1980). Findings based on male subjects rather than female subjects are then generalised to the whole population (Levy & Richey, 1988). Therefore, there is a need to investigate specific aspects of women's health and health behaviours in relation to women.

The subjects who comprised this study were given a number of questionnaires (the first set) in the beginning of the study. These related to Health Beliefs, Health Locus of Control, Self-Efficacy, Health Behaviours, Physical Health and Psychological

Health. Those subjects who returned the completed first set of questionnaires were then provided with written information about health and engaging in health-related behaviours. One week after the distribution of this written information, the subjects were given a second set of questionnaires relating to Health Beliefs, Health Locus of Control, and Self-Efficacy.

At an interval of one month after the distribution of the second set of questionnaires and the written information, subjects were given the full set of questionnaires comprising of the first and second set of questionnaires except Self-efficacy questionnaire. The responses of the subjects on the full questionnaire were then collated and analysed.

The questions which the present study seeks to answer are formulated in the Hypotheses as follows:

10.0) Hypotheses

1) It is hypothesised that healthy behaviours would be associated with good health at the time of the measurement. This hypothesis is formulated as a preliminary analysis to establish whether there is a relationship between self reported healthy behaviours over a period of three months prior to the participation in the present study, and good health both physical and psychological.

2) It is predicted that the greater the reported Likelihood of having bad health in the Near and Distant Future, the greater the Concern about having bad health in the Near and Distant Future and the greater the Seriousness with which women view having bad health in the Near and Distant Future at Time 1 and Time 3, the healthier would be the Behaviours they would engage in at both Time 1 and Time 3, and the better would be their Health at that Time of the measurement. The purpose of this hypothesis is to find whether health beliefs at Time1 and Time 3

are related to health behaviours the time of the measurement. That is whether health behaviours at Time 1 and Time 3 sequentially followed health beliefs at those times.

3) It is predicted that the higher the Internal Locus of Control and the lower the External Locus of Control and Chance Locus of Control at Time 1 and Time 3, the healthier would be the Behaviours that women would engage in at Time 1 and 3, and better would be their health at the time of the measurement. The purpose of this hypothesis is to ascertain that health locus of control predicts the compliance with health behaviours and subsequently women will report better health .

4) It is predicted that as a result of information provided to women, they would report increased Likelihood about having bad health in the Near and Distant Future, increased Concern about having bad health in the Near and Distant Future, and increased Seriousness about having bad health in the Near and Distant Future. However, no significant changes are predicted in the Health Locus of Control dimensions and measures of Self-Efficacy. This hypothesis is formulated to determine whether written information provided to women participants will change their health beliefs, which in turn will change their health behaviours. However, no significant changes are predicted in the Health Locus of Control, dimensions and measures of Self-Efficacy.

5) It is hypothesized that the change in Health Behaviours from Time 1 to Time 3 is related to the change in Health Beliefs from Time 1 to Time 2. However, no significant relations are predicted in the change in Health Behaviours from Time 1 to Time 3 with Self-Efficacy and Health Locus of Control from Time 1 to Time 2. The purpose of this hypothesis is to determine whether the change in health behaviours at Time 3 is subsequently followed by the change in health beliefs of women from Time 1 to Time 2 as a result of the written information provided to the participants.

CHAPTER 2

METHOD

The plan of the present study was to determine the extent to which Self-Efficacy, Health Locus of Control, and Health Beliefs were predictive of compliance with health behaviours in women. The health behaviours taken into consideration were Smoking, Diet, and Exercise. The study also aimed at exploring whether the health behaviours of the women who participated in the study changed over the period of three months, that is from Time 1 to Time 3.

1.0   DESIGN

The present study was carried out over a period of three months. The participants were given a package of self-reported assessment tasks at each of three times (referred to as Time 1, Time 2, and Time 3 respectively). At Time 1, participants were given six questionnaires. These were Health Behaviour, Self-Efficacy, Health Belief, Health Locus of Control, General Health Questionnaire, and Physical Health. The questionnaires at Time 1 established the relationship between self-reported Health Behaviours and Health (Physical & Psychological), and between Health Behaviours and Self-Efficacy, Health Belief, and Health Locus of Control. One week prior to Time 2 testing, participants were provided with written information concerning health and health risk behaviours. At Time 2, the questionnaires, Health Belief, Self-Efficacy, and Health Locus of Control were readministered to test the effectiveness of the intervention. It was assumed that as a result of intervention subjects Health Beliefs will change. Whereas, no change was ascertained in subjects' Self-Efficacy and Health Locus of Control. At Time 3, the same questionnaires at Time 2 (except Self-Efficacy) were again administered. Time 3 assessment examined to find the

change in health behaviours of participants from Time 1 to Time 3, and to determine whether this change in health behaviours from Time 1 to Time 3 sequentially followed from Time 2. At Time 3, the relationship between Health Behaviours and Health (physical and psychological), and Health Belief, and Health locus of Control were again examined.

2.0 SUBJECTS

Subjects were academic, non-academic women and also female students studying at the University of New England. Names and contact telephone numbers of administrative women staff of the University were collected with the help of administrative agencies of this University. In respect of some women academic staff members, the investigator obtained names and contact telephone numbers from the University of New England phone book. For women students, the experimenter approached heads of different residential colleges of the University of New England, who in turn helped the investigator distribute the information about the study and an invitation to participate.

The experimenter then contacted prospective participants by phone and explained the nature of the project to them. Two hundred and fifty women indicated that they were interested in the project. These women were sent information about the project and were informed they would be required to complete questionnaires at a) the beginning of the project (Time 1), b) about one month later (Time 2), and c) approximately three months' time from Time 1 (Time 3). One hundred and fourteen women completed the questionnaires at Time 1 (Mean age: 36.82; S.D 10.72; age range: 18-59 years), 89 women completed questionnaires at Time 2 (Mean age: 38.52; S.D 10.46; age range: 18-59), and 81 women completed questionnaires at Time 3 (Mean age: 40.73; age range: 19-59).

In the present study the drop-out rates among participants was minimal. The investigator considered the suggestions made by Baronowski et al., (1990),

highlighted in Chapter 1, in which compliance to new health behaviours is enhanced by making the programmes easy to follow. To make the task less cumbersome, and easy to follow, questionnaires were divided into three sets over the period of three months. This helped to reduce the drop-out rates among participants. As well the investigator had a personal approach and kept in touch with the participants over the period of three months. This regular contact was effective as it minimised the drop-out rates.

3.0   MEASURES

Subjects completed questionnaires designed to assess their Health Behaviours, Self-Efficacy, Health Beliefs, Health Locus of Control, Psychological Health, and Physical Health. Subjects completed these questionnaires at Time 1, Time 2, and Time 3 as shown in Table 1. The Health Behaviour Scale, the Psychological Health Scale, and the Physical Health Questionnaire were completed at Time 1 and Time 3. The Self-Efficacy Scale was completed at Time 1 and Time 2; and the Health Belief and Health Locus of Control Scales were completed at Time1, Time 2, and Time 3.

Schedule of Questionnaires

Table 1	Time 1	Time 2	Time 3
Health Behaviour	X		X
Self Efficacy	X	X	
Health Belief	X	X	X
Health Locus of Control	X	X	X
General Health Questionnaire	X		X
Physical Health	X		X

3.1)   HEALTH BEHAVIOUR:

The Health Behaviour Questionnaire used in this study was based on Hase's Pre-Heart Attack Health Behaviour Questionnaire (1992).   The Health Behaviour Questionnaire assessed the Smoking, Diet and Exercise behaviours of subjects over the previous three months.   The Questionnaire included information relating to Smoking, Diet, and Exercise.   It was pointed out to the participants that smoking habits included the quantity of cigarettes smoked and the tar content of the cigarettes; fatty foods like fatty meat, chicken skin, whole milk, cheese, and eggs contain saturated fats; and exercise included activities like walking, swimming, cycling, jogging, aerobics etc. The Questionnaire is shown in Appendix A2.

In providing information about their Smoking Behaviour, subjects indicated the average number of cigarettes smoked and the tar content smoked per cigarette by them per day.   The amount of tar content per cigarette is given on the packet of cigarette.   The number of cigarettes smoked was rated on a 7-point scale: ranging from 1, *I do not smoke at all* to 7, *I smoke more than 20 cigarettes*.   The tar content of the cigarettes smoked by subjects was rated as Low (up to 4 mg), Medium (5 mg-12 mg), and High (13 mg and higher).   The number of cigarettes smoked was scored from 1 to 7 and the Tar Content was scored on a range of 1 (Low), 2 (Medium), and 3 (High).

Subjects' Dietary Behaviours were assessed by asking them to indicate their intake of Saturated Fat, Vegetables and Fruits, and Wholegrains and Cereals over the last three months on a 5-point rating scale.   Subjects indicated their Saturated Fat intake over the last 3 months as follows:

1, *My diet is completely free of saturated fats* to 5, *My diet has high amount of saturated fats*, Vegetables and Fruits intake 1, *I eat high amount of vegetables and fruits* to 5, *I do not eat any vegetables and fruits*, and Wholegrains and Cereals intake 1, *I consume high amounts of wholegrains and cereals* to 5, *I do not consume any wholegrains and cereals*.

Subjects also reported their Exercise behaviour over the previous 3 months on a 10-point rating scale as follows:

1, *On an average, I exercise for approximately 40 minutes a day for at least 5 days a week* to 10, *I engage in little or no exercise.*

3.2   HEALTH BELIEF

The Health Belief Questionnaire, (Appendix A3), comprised three components namely, Likelihood, Concern and Seriousness. Each of the three components are most widely used by researchers in investigations with Health Belief Model. In the present study these components were assessed in two time frames, 'in the Near Future', and 'in the Distant Future'. This was done to assess how subjects perceived their health in the near future and the distant future. Subjects were asked to provide information about the Likelihood of their having bad health in the Near and the Distant Future, their Concern about having bad health in the Near and the Distant Future, and the Seriousness with which they viewed having bad health in the Near and the Distant Future.

Perception of subjects regarding their likelihood of having bad health in the near and distant future was measured by asking them to respond to Likelihood questions. An example of questions are, 'how likely it is that you will have bad health in the near future' and 'how likely it is that you will have bad health in the distant future'. Subjects' concern of having bad health in the near and distant future was measured by responses to the Concern questions. An example of a question was, 'how concerned are you about having bad health in the near future', and 'how concerned are you about having bad health in the distant future'. Similarly the Seriousness with which subjects viewed their having bad health in the near and distant future was measured by asking them questions on Seriousness, for example, 'how serious is it to have bad health in the near future' and 'how serious is it to have bad health in the distant future'.

Each question on Likelihood, Concern and Seriousness was answered on a 4-point scale. For Likelihood questions the scale ranged from 1= Very likely to 4=Not at all likely; for Concern questions the scale ranged from 1=Very concerned to 4=Not at all concerned; likewise, for Seriousness questions, the scale ranged from 1=Very serious to 4=Not at all serious. A low score on each of the questions by the subject's was indicative of strong belief and a high score indicated poor belief.

3.3   SELF-EFFICACY

The Self-Efficacy questionnaire, shown in Appendix A4, assessed the level and confidence of Self-Efficacy for Smoking, Diet and Exercise Behaviours. This questionnaire required the subjects to indicate the level of health behaviour they believed they would achieve in three months' time. Subjects were also required to indicate on a 100-point scale the degree of confidence they had in achieving the chosen behaviour in three months' time. In the confidence rating scale, '0' referred to very low or no confidence, '50 - 60' referred to moderate confidence, and '90 - 100' referred to very high confidence.

With respect to Smoking, subjects' Self-Efficacy level was assessed by asking them to indicate the average number of cigarettes and the level of tar content in the cigarettes that they would smoke in three months' time. The level of Smoking Self-Efficacy was rated on a 7-point scale: 1, *I will not be smoking at all* to 7, *I will smoke more than 20 cigarettes*), and the Self-Efficacy for tar content was rated as Low (*up to 4 mg*), Medium (*5 mg-12 mg*), and High (*13 mg and Higher*).

Subjects also indicated the confidence they had in achieving the smoking behaviour in three months' time. The level of Dietary Self-Efficacy was reported by subjects by indicating their Saturated Fat, Vegetables and Fruits, and Wholegrains and Cereals intake in three months' time on a 5-point rating scale:1, *My diet will be completely free of saturated fats* to 5, *My diet will have a high amount of saturated fats*, Vegetables and Fruits Self-Efficacy 1, *I will eat high amount of vegetables and fruits*

to 5, *I will not eat any vegetables and fruits*, and Wholegrains and Cereals Self-Efficacy 1, *I will consume high amount of wholegrains and cereals* to 5, *I will not consume any wholegrains and cereals*.

Subjects also indicated their confidence that they would be able to achieve the chosen dietary behaviour in three months' time.

Exercise Self-Efficacy level among subjects was assessed by asking them to report the average amount/level of exercise they would do in three months' period. The level of Exercise Self-Efficacy was rated on a 10-point scale: 1, *On an average I will exercise for approximately 40 minutes a day for at least 5 days a week* to 10, *I will engage in little or no exercise*. Subjects also indicated the confidence that they had in achieving the chosen exercise behaviour. A high score on the confidence rating scale indicated strong belief that the desired behaviour change would be achieved in a given period of time and a low score indicated poor belief that the desired behaviour change would be achieved in a given period of time.

3.4 HEALTH LOCUS OF CONTROL

The Health Locus of Control (HLC), scale as shown in Appendix A5, was based on Multidimensional Health Locus of Control (MHLC) Scale designed by Wallston, Wallston and DeVellis (1978). Wallston, Wallston and DeVellis (1978) reported that the MHLC scale had high construct validity and predictive validity. They also reported that the test-retest reliability was 0.688 for Internal subscale, 0.745 for the Powerful Other subscale, and 0.687 for the chance subscale (Hallal, 1982).

The scale consisted of 18 items with scores ranging from 1 to 6 (Strongly Disagree to Strongly Agree) and comprised of 6 questions on each of the three components, (a) Internal Health Locus of Control, (b) Powerful Others Health Locus of Control represents the External Health Locus of Control, and (c) Chance Health Locus of

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Control. The list of items were placed in random order. The subjects indicated the response for each item, which was most appropriate as it applied to them.

Among the queries in the three components, the question, 'I am in control of whether I have bad health or not', measures the Internal health locus of control. The question, 'My family has a lot to do with my having or not having bad health', measures Powerful Others health locus of control. And the question, 'Luck plays a big part in determining how quickly I recover from bad health' measures Chance health locus of control. The subjects were required to respond to each of these questions on a 6-point scale: 1=*Strongly Disagree* to 6=*Strongly Agree*. A high score on each of the three components indicates a high Internal, high Powerful Others, and a high Chance health locus of control subjects.

The sum of ratings for questions indicative of internal health locus of control provided the Internal health locus of control score. The sum of ratings for questions indicative of powerful others provided the Powerful Others health locus of control scores. Likewise, the sum of ratings for questions indicative of chance health locus of control provided the Chance health locus of control score.

3.5   PSYCHOLOGICAL HEALTH

The General Health Questionnaire (GHQ) is a self-reported questionnaire designed to identify personality traits of individuals and measures their inability to carry out normal functions in anticipation of distress situations and past experiences (Goldberg, 1972). All versions of the GHQ have proved to be reliable and a valid measure of psychological health. The present study employed the 28 item version of the scale and therefore this version warrants special mention here. Goldberg and Williams (1988) reported 12 studies that showed the validity of the scale for assessing the general psychological health of the individual.

The validity of the shorter version comparing the 28-item scale of the General Health Questionnaire of Goldberg (1972) was presented by Goldberg and Hiller in 1979. This scale consists of 4 sub scales a) Somatic symptom b) Anxiety and Insomnia c) Social dysfunction d) Severe depression.

For the preparation of the 28-item GHQ, 523 questionnaires were completed by consecutive attenders to a group practice in South Manchester for a survey previously described by Goldberg et al (1976a). For this analysis all 60 questions were scored using Likert scoring (0-1-2-3). Eleven significant factors accounted for 53.5% of the total variance. The analysis was repeated using 28 chosen items. The first four factors were found to have 59% of the total variance. Split half reliability was reported as .78. This was further confirmed and validated by researchers like Vieweg and Hedlund, (1983); Burvill and Knuiman, (1983); Cheng (1985); Power (1988); Winefield, Goldney, Winefield and Tiggemann (1989); and Huppert, Walters, Day and Elliot (1989). The test-retest correlation of the GHQ-28 item scale has been found to be sound and valid by Robinson and Price (1982). Validity tests has also been found to be sound (Banks, 1983); Lindsay, (1986).

The 28-item version of the General Health Questionnaire (GHQ-28; Goldberg & Williams, 1988) was used to assess the Psychological Health of women (see Appendix A6).

This questionnaire was directed to assess Somatic Health (*items 1-7*), Anxiety (*items 8-14*), Social Dysfunction (*items 15-21*), and Depression (*items 22-28*) experienced by the subjects. Subjects were required to answer each of the following questions on a 4-point scale:

(eg., "Been feeling perfectly well and in good health," "Lost much sleep over worry," "Been managing to keep yourself busy and occupied," and "Been thinking of yourself as a worthless person,")

The responses to these questions were as follows: Better than usual, Same as usual, Worse than usual, Much worse than usual; Not at all, No more than usual, Rather more than usual, Much more than usual; More so than usual, Same as usual, Rather less than usual, Much less than usual; Not at all, No more than usual, Rather more than usual, and Much more than usual. These responses were scored as 0, 1, 2 and 3 respectively. The responses representative of better psychological health were scored as '0', those representative of poor psychological health were scored '3', and other intermediate responses were scored as '1' and '2' respectively on a 4-point rating scale. The total score for 28 items indicated overall/general psychological health. Of this total score, questions 1-7 measured the condition of Somatic Health; questions 8-14 indicated Anxiety; questions 15-21 measured Social Dysfunction; and questions 22-28 measured Depression. A low score on the total GHQ was indicative of better psychological health while a high score indicated poor psychological health.

3.6   PHYSICAL HEALTH SCALE

The Physical Health Scale shown in Appendix A7, has two measures. The first part of the scale measures the subjects' self-reported physical health. This part of the scale has been used in a number of studies and found to be a valid measure (Dua, 1993, 1994). The second part of the scale requires the subjects to report the frequency with which they suffered from various illnesses included in the questionnaire, during the past three months. This part of the scale was based on a measure developed by Greenberg (1981). For the second half of the Physical Health Scale, the internal consistency of the illness scores has been found to be .73 (Nowack, 1989).

Subjects were asked to report their physical health on a 5-point scale varying from 'very bad' to 'very good'. In addition, the questionnaire consisted of seven physical illness-related questions directed to assess physical health. The questions related to injuries/accidents; infections (bacterial or viral); respiratory illness; gastrointestinal illness; headaches, migraines or neurological disorder; cardiovascular illness; and miscellaneous other symptomatology or illness. Subjects were also asked to indicate

miscellaneous other symptomatology or illness. Subjects were also asked to indicate on a 5-point scale, (1 = not at all; 2 = once; 3 = two times; 4 = three times; 5 = four or more times), the number of times in the past three months that they have suffered from these illnesses. The seven illness categories taken together yielded an individual's illness score.

3.7)   INTERVENTION

An intervention in the form of written material was included in the study. The material contained information about health and health risk factors, (smoking, dietary habits, and exercise behaviours), and was prepared by the investigator. The purpose of the written information was to stress the importance of health in general, and how smoking cigarettes, eating unhealthy foods, and lack of exercise could threaten the better health of the individual. Intervention through written material has been used, for example, in health promotion, primary prevention, secondary prevention, and tertiary prevention (Pender, 1982). It has also been used by Weiss (1984). Although the intervention in the present study was not ordered as a way of theoretical treatment, it is a form of intervention..

The written information was developed on the basis of theoretical evidence that educational programmes provide help in modifying health risk factors. It is acknowledged that the electronic and print media can play an important role in promoting better health by providing their audiences with information about the detrimental effects of health related risk factors such as smoking (Flay, 1987).

Among other studies on the impact of written information highlighted in Chapter 1, one study conducted by Armstrong, Klerk, Shean, Dunn and Dolin (1990), underlines the importance of the information and of awareness programs relating to the detrimental effects of smoking on an individual's health. These researchers found that smoking prevention programmes were effective in making people change smoking habits. Studies like these provide the basis for the adoption of written communication

as a standard in enquires about health and health related behaviours. (See Appendix A8 for the text of the written information).

The material for the written information in the present study was mainly taken from the literature published by the Australian National Heart Foundation. The written information was posted to those subjects who returned the completed set of Time 1 questionnaire, together with the consent form.

4.0   PROCEDURE

The investigator sought permission from the Ethics Committee of the University of New England, Armidale, for carrying out the research on women's health behaviour. After approval from the Ethics Committee, the investigator contacted academic and non-academic women staff, and students by phone. The nature of the study was explained to them. Those who agreed to participate in the project were required to fill in the questionnaires at three different times referred to in the present study as Time 1, Time 2 and Time 3.

Time 1 Testing

Two hundred and fifty women agreed to participate in the present study. The subjects were then sent the first set of questionnaires which related to Health Behaviour, Physical Health, Psychological Health, Self-Efficacy, Health Locus of Control and Health Beliefs. Health Behaviours included in the present study were Smoking, Diet, and Exercise. The front page of the set of questionnaires described the nature of the study. Subjects were also asked to provide their name, age and occupational status and their written consent to take part in the study.

Time 2 Testing

Out of the two hundred and fifty subjects who agreed to participate, one hundred and fourteen returned the completed set of Time 1 questionnaires. The subjects who returned the Time 1 questionnaires were sent some relevant materials to read for one week. The information contained in the material was about health and health- related risk factors, for example, how smoking cigarettes could be detrimental to an individual's health and could cause major health problems (e.g., lung cancer); how eating high levels of saturated fat, fewer vegetables and fruits, and less wholegrains and cereals could pose a threat to health; and how lack of exercise could be detrimental to health in general (see Appendix A8, for detailed information).

Subjects were provided with Time 2 questionnaires one week after providing them with written information (approximately one month from the beginning of the study). The Time 2 questionnaires provided were Health Belief, Self-efficacy, and Health Locus of Control. These questionnaires were provided to subjects to ascertain whether written material impacted on the subjects' health beliefs, self-efficacy and health locus of control.

Time 3 Testing

Questionnaires for Time 2 were returned by eighty-six subjects. Those subjects who returned Time 2 questionnaires were provided with the last set of questionnaires approximately three months from the beginning of the study. The Time 3 questionnaires were Health Behaviour, Health Belief, Physical Health, Psychological Health, and Health Locus of Control. These questionnaires were provided to subjects, to assess any change in health-related behaviours. It was also intended to determine their Psychological and Physical health to see if modification of Health Behaviours (e.g., Smoking, Diet, and Exercise habits) lessen the risk of health problems.