Adolescents' perceptions with regard to health risks, health profile and the relationship of these variables to a psychological factor ...

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ADOLESCENTS' PERCEPTIONS WITH REGARD TO HEALTH RISKS, HEALTH PROFILE AND THE RELATIONSHIP OF THESE VARIABLES TO A PSYCHOLOGICAL FACTOR - A STUDY ACROSS GENDER AND DIFFERENT CULTURAL SETTINGS

A thesis submitted in fulfilment of the requirements for the award of the degree

DOCTOR OF PHILOSOPHY

from

THE UNIVERSITY OF WOLLONGONG

by

YOUNG-HO KIM, B.Ed., M.Ed.

FACULTY OF EDUCATION

1997
ACKNOWLEDGMENTS

The writer wishes to express his deepest appreciation and gratitude to Dr. John Patterson for such a high level of scholarly, skilled assistance throughout the duration of this study.

In addition, special thanks are due to the administrative staff and student colleagues in the Faculty of Education for their understanding and full support.

Gratitude is extended to Dr. Ki-Woong Kim at Ewa Women's University, Seoul for his valuable encouragement, not only to this study but, to the total overseas experience the writer undertook.

With much love and affection, the writer expresses his appreciation to his father and mother for their encouragement and devotion. Their dedicated contribution to his education has been inestimable. Finally, the writer wishes to express his greatest gratitude to his lovely wife SunWon and son HyunWoo.
ABSTRACT

This thesis reports on research that was undertaken to investigate health risk perceptions and health profile of adolescents of the same ethnic background in two different cultural settings. Further, it attempts to identify a possible linkage between health risk perceptions and health profile of adolescents and psychological factor. The data obtained provides a basis on which to potentially develop, refine or co-ordinate educational strategies concerning adolescent health, particularly directed towards the ethnic group which was the focus of the study.

The major research questions were directed towards adolescents' own perceptions with regard to personal health risks; comparison of these perceptions of health risks with those risks perceived for other people of the same age; and, differences in health risk perceptions, health profile and psychological variables of adolescents across gender and cultural settings. Moreover, they attempted to identify a relationship of psychological variables with the domains in health risk perception and the dimensions in health profile; and, a relationship between health risk perception, health profile and a constructed psychological factor.
Four hundred and sixteen Korean national students randomly selected from high schools in Seoul, Korea and Sydney, Australia were the subjects used in this study. The study was quantitative, with data gathered through the use of the standardised and self-reported survey questionnaires that examined health risk perceptions and health profile of adolescents and psychological variables relating to them. Descriptive analysis, independent t-test, paired t-test, univariate and multivariate analysis of variances, regression analysis and factor analysis were used to analyse the data.

Results indicated that adolescents tended to have unrealistic perceptions about their vulnerability to the overall health risks and perceived their likelihood of health mishap as lower than that of others in the same age.

Female adolescents, when compared with males, tended to perceive their own health risks as lower than those of their male peers. Cultural differences existed in optimistic bias in that adolescents in Seoul perceived their likelihood of most of the health risks as lower than risks faced by the Sydney adolescents.

The differences in health profile were not revealed between male and female adolescents. For the cultural differences, however, adolescents in Seoul reported high scores on Self-actualisation,
while the Sydney adolescents responded with higher scores on the health related items of Health Responsibility and Exercise.

Further, differences in psychological variables were found according to gender and culture. Male adolescents reported higher scores on Internal Health Locus of Control and Self-esteem than female adolescents, while females tended to be more dependent upon Powerful Other Health Locus of Control than males. For cultural differences, adolescents in Seoul rated higher scores on Internal Health Locus of Control than those in Sydney, however, for Self-efficacy and Self-esteem the Sydney adolescents reported significantly higher scores than the counterpart sample.

Results pointed out that the selected psychological variables significantly contributed to the domains in health risk perception and the dimensions in health profile, and there was a relationship between health risk perception, health profile and psychological factor.
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CHAPTER I

INTRODUCTION

This chapter briefly discusses adolescent health, issues related to health risks of adolescents, and factors associated with adolescents' health risk perceptions and health profiles. It also identifies the purpose and significance of the study and the delimitations and limitations of the study.

Adolescence is typically viewed as a transitional period between childhood and adulthood and a time during which young people continue to develop the social and intellectual skills that will prepare them for adult roles and responsibilities (Millstein, Petersen & Nightingale, 1993).

During this period, adolescents reach physical and sexual maturity, develop more sophisticated reasoning ability, and make important educational and occupational decisions that will shape their adult careers. It is also, unfortunately, a period fraught with many threats to the health and well-being of adolescents and with substantial consequent impairment and disability. Many of the adverse health consequences experienced by adolescents are, to a large extent, the result of
their risk behaviours and perceptions (DiClemente, Hansen & Ponton, 1996).

Along with the fundamental physical changes which occur during adolescence, a great many of the psychological attributes which shape and regulate the occurrence of health behaviours are either acquired or consolidated during adolescence. Young people's attitudes and beliefs, their motivations and personal control, and their self image and self-esteem are substantially determined by important changes in psychological abilities which shape their capacity to understand health problems and avoid them (Penny, Bennett & Herbert, 1994).

From a developmental perspective, adolescence has been considered a healthy stage of life and health has been improved by social changes, better medical management, as well as psychological advances (Bennett, 1982; Robertson, 1986; Mark & Fisher, 1987). However, this period still produces many problems of a physical, psychological and social nature that can threaten not only the young person's health, but also the health and well-being of future adulthood.

Across diverse cultures, many adolescents today and perhaps an increasing number in the future, are at risk from death, disease and other adverse health outcomes. In general, there have been marked changes in the causes of mortality and morbidity within the adolescent population. Previously,
infectious diseases accounted for a disproportionate share of adolescent mortality and morbidity. At present, however, the overwhelming toll of adolescent mortality and morbidity is the result of behavioural factors and, therefore, adolescents are a target group for reducing risks attributed to accident related behaviour, sexual behaviour, substance use and abuse behaviour, mental health behaviour and nutrition behaviour (U.S. Department of Health and Human Services [DHHS], 1991).

The rationale for focusing on these particular health issues becomes obvious when the major sources of mortality and morbidity during adolescence are examined. According to research in the United States and Australia, which demonstrate remarkably similar patterns of mortality and morbidity of adolescents, the three primary causes of mortality during adolescence are accidents, homicide and suicide; these factors are responsible for 75 percent of all adolescent deaths. Major sources of adolescent morbidity include accident and disability associated with the use of motor and recreational vehicles; consequences of sexual activity such as AIDS, Sexually Transmitted Diseases [STD], pregnancy and abortion; and, the consequences of substance use. Other significant sources of morbidity include mental disorders, chronic illness, and eating disorders (Gans, Blyth & Elster, 1990; Australian Bureau of Statistics, 1991; Irwin, Brindis, Brodt, Bennett & Rodriguez, 1991; National Centre for Health Statistics, 1993). The major causes of morbidity and mortality have been associated with risk taking behaviours.
These health risk behaviours may become increasingly problematic in the future. The initiation of risky behaviours is occurring at progressively younger ages. For example, youth start using alcohol, tobacco and other drugs at markedly earlier ages (Penny et al., 1994). As a result of these trends, many adolescents may be vulnerable to experiment and initiate risk behaviours that have deleterious consequences during adolescence (Dryfoos, 1990). Some of these behaviours have consequences that are not readily manifest until adulthood, as is the case with HIV infection acquired during adolescence progressing to AIDS, or smoking which may significantly contribute to mortality and morbidity in later life (Office of Disease Prevention and Health Promotion, 1993).

In Korea, risk-taking behaviours are only now being considered crucial factors in the health status of adolescents and important public health and social issues. Unlike the United States and Australia, however, data related to adolescent health status and behaviour in Korea are limited. Available Korean studies do however, demonstrate similar trends to these countries. For example, studies report that the rates of smoking, drinking alcohol and drug use during adolescence, have remarkably increased since the 1980's and more seriously, the negative risk behaviours of adolescents tend to correlate with adolescent delinquency (Korea Institute for Youth Development [KIYD], 1995; The Ministry of Culture and Physical Education, 1996). In addition, this research argues that risk-taking behaviours of
adolescents are closely associated with several kinds of social factors such as peer pressure, breakdown in family relationships, and dissatisfaction with home and school life. These attempts to identify the issues related to adolescent health problems and causes of risk-taking behaviours in adolescents are limited and Korean policy and research regarding adolescents and their health status are still in their infancy.

Interest in health has gradually increased and within this context, recent years have also witnessed and considerable attention to the question of how to improve the health status of adolescents. Whilst a large volume of programs have attempted to improve the health-related skills of adolescents and to change personal behaviours and perceptions from health-damaging to health-promoting ones, they have, until recently, overlooked the social factors and psychological variables relating to health-risk behaviours and perceptions.

Health concerns of adolescents appear to vary with their achieved maturity, cultural background, socio-economic situation, environment and, most importantly, their own perceptions about health risks. Regarding perceptions of vulnerability to health risks, it is broadly recognised that adolescents often have misperceptions about health issues, although with enough exposure, such as in the case of information on AIDS, their knowledge increases. Furthermore, a widely held belief regarding adolescents is that they perceive
themselves as being invulnerable to harm as a direct result of their level of psychological development (Penny, Bennett & Herbert, 1994).

The literature also implicates low self-esteem as a factor in risk-taking behaviour which can lead to lowered health status (Baumrind, 1987). When adolescents were asked to identify what they saw as being major problems for themselves, they identified a range of psychological problems such as those related to concern for their failures, a sense of belonging and the development of social relationships (Robertson, 1986).

As one would expect, younger adolescents possess less factual knowledge about a variety of health topics than do older adolescents (Morrison, 1985). Finn and Bragg (1986) and Jonah (1986) report that young drivers perceived less risk in speeding and night driving than older drivers. This suggests that accident rates among youth may reflect a failure to perceive dangerous situations. Perception about avoiding life's risks can be different according to gender. Smith and Rosenthal (1995) investigated the differences of health risk perceptions between boys and girls and report that girls rated some activities such as drinking-driving, sexual intercourse and drug use as significantly more risky than did boys.

Along with the age or gender differences, perceptions of vulnerability have been shown to vary as a function of race or culture. Specifically, black and Hispanic adolescents in U.S. feel
more susceptible to a variety of health outcomes, such as cancer and AIDS, than do their white peers (Eisen, Zellman & McAlister 1985; Price, Desmond, Wallace, Smith & Stewart 1988).

According to various professional and popular literature, health in interdisciplinary perspective is used as a comprehensive term, defining a physical and mental state in which an individual is capable of processing inner and outer reality in a productive and satisfying manner. This concept follows modern theoretical approaches to human development that are based on the assumption that social (environmental), psychological (personal) and biological (somatic) factors affect the formation of health behaviours and perceptions. According to this concept, it is important to remember that the state of health reflects the subjective processing of and coping with physiological, psychological and social factors and also is affected by inter-correlations among such factors (Bennett & Murphy, 1997).

If factors associated with health risk perceptions and health behaviour of adolescents are identified, they can be adapted to fit adolescents' specific and special needs. There are a number of questions that are generated by this statement. These questions form the framework for this study of adolescent health perceptions and behaviours.
1.1. The Purpose of the Study

Adolescence is a time of rapid physical, psychological and social change. These multiple changes promote exposure to some new health risks such as drug use and sexual activity. Adolescence, thus, is a key life stage for the shaping of health in adulthood and in later life and, at the same time, is in itself a stage of risk for morbidity and mortality.

Traditionally, issues concerning adolescent health have been focused on providing information, education and counselling programs without fully considering the psychological and social factors associated with adolescents' risk perceptions and behaviours. As a result, it is timely to rethink the concept of adolescent health and consider it in a comprehensive approach of health promotion for adolescents.

Today, it is broadly recognised that research about adolescent health issues have to focus, not only on the long-term consequences of specific diseases but also, on health-related knowledge, perceptions and behaviours. Moreover, many studies have argued that such perceptions and behaviours of adolescents with regard to health risks can be related to the important psychological constructs.

In this regard, psychological factors that influence the health behaviours and health risk perceptions of adults have
frequently been identified. However, the same level of research has not been focused on the adolescent population. There has been little discussion, for example, about how adolescents perceive the health information to which they are exposed and what factors affect adolescents' behaviours and perceptions; particularly factors such as psychological constructs, cultural background and gender.

The purpose of this research was to investigate health risk perceptions, health profiles and psychological variables of adolescents. In addition, this study examined the possible relationship of selected psychological variables on health risk perception and health profile of adolescents. It also investigated a possible causal relationship between health risk perception, health profile and psychological factor related to adolescent health status; and, focused on the subjects of the same ethnic background located in two different cultural settings. Specifically, the major research questions investigated were:

1. How do adolescents perceive their own health risks and compare their own likelihood of health risks with that of other people in the same age group?
2. Is there a difference in health risk perception of adolescents across gender and cultural settings?
3. What are the differences in health profile across gender and cultural settings?
4. What are the differences in psychological variables across gender and cultural settings?

5. Is there a relationship between the five psychological variables and health risk perceptions and health profiles of adolescents?

6. What is the relationship between health risk perception, health profile and psychological factor?

Data gathered to provide answers to these questions were used for the purposes of testing the following research hypotheses:

1. Adolescents will perceive their own chances of the health risks as lower than those of other people of the same age.

2. There will be a difference in health risk perception of adolescents across gender and the different cultural settings.

3. There will be a difference in health profile across gender and the different cultural settings.

4. There will be a difference in psychological variables across gender and the different cultural settings.

5. There will be a relationship with each of the five psychological variables with health risk perceptions and health profiles of adolescents.

6. There will be a relationship between health risk perception, health profile and psychological factor.
1.2. The Significance of the Study

Adolescents show considerable prevalence and incidence rates in specific health problems and numerous programs and interventions demonstrate the difficulties involved in changing established health problem behaviours and risk taking perceptions (Hurrelmann & Losel 1990; Lavery & Siegel, 1993). Since it is broadly recognised that many self-destructive behaviours and risk perceptions related to health have been predicated on multiple factors associated with adolescence, this period has become a key period for prevention.

Previous studies about adolescent health focus on antecedents of health risk perception and, risk-taking behaviours of adolescents have generally seen these constructs in isolation from other factors and sometimes in isolation from social and psychological factors which contribute to behaviours and perceptions of adolescents. There are numerous studies of adolescent smoking behaviour, alcohol use, knowledge and attitudes about AIDS and dietary choices, which are meritorious in their examination of these problems. However, individually and collectively, they fail to consider relationships between behaviours and other factors which become apparent in the examination of the literative consideration of the complex nature of the psychology and sociology of health.
An important aspect of this study lies in the fact that it has the potential to identify various factors that contribute to positive or negative perceptions that in turn could lead to health improvement or health breakdown in adolescents. In addition, the study has the potential to contribute to the existing knowledge about adolescents in general and provide information about the factors contributing to the adolescents' health, particularly in the Korean ethnic group.

The results may have a great potential value to educators because of the possibility of modification of students' perceptions and behaviours regarding health risks through educational practices. In other words, the findings of this study could help educational administrators at different levels to consider the needs of students in their educational planning and to meet the needs of students in curriculum planning for health education. They could also assist teachers and counsellors to reach a better understanding of their students and to determine how to teach the students to attain positive health perceptions and behaviours.

From the community perspective, this study provides a knowledge base on which to build more effective health services and to emphasise integrated health promotion activities. Again, health-related strategies could be planned and developed to maintain and improve the health profile of adolescents on a community-wide level.
In Korea, there is a lack of studies on adolescents. The field of adolescent health is just beginning to develop and there is a lack of research which describe the prevalence and incidence of health behaviour and there are virtually no studies which research health risk perception and related variables of Korean adolescents. This study makes an important contribution to those domains. More importantly, by investigating aspects of health-related behaviour and risk perception of Korean adolescents it may encourage the development of education and health-related fields and lead to the increased social awareness and political interest.

1.3. Delimitations

The study was delimited in the following manner:

1. The subjects were randomly selected 416 male and female Korean adolescents aged 14 to 18 who attended schools in Seoul, Korea and Sydney, Australia.

2. The variables were health risk perceptions; health profiles; psychological variables pertaining to their personal health, such as health locus of control, self-efficacy, self-esteem, and gender and cultural setting which were identified as the demographic factors.
1.4. Limitations

The investigation undertaken in this study contributed to understanding related areas of adolescents health status such as health risk perceptions and health profiles. There existed, however, circumstances which were unable to be controlled that could have affected the study results:

1. The study tried to select a sample which might allow the results to be generalised beyond the Seoul and the Sydney area, but generalizability should be tested by further studies.

2. The survey was not administered to adolescents other than those attending schools on the nominated day. To increase external validity to adolescents in general, information needs to be obtained from adolescents aged 14 to 18 years who do not attend schools, who, for example, may be homeless or those who may be already in full-time employment.
3. Means, standard deviations, t-test, univariate and multivariate analysis of variance for dependent means, a linear regression analysis and a confirmatory factor analysis for a linear relation and a causal effect represented the major statistical procedures used in this study. The use of such analytical procedures with data reaching only an ordinal level of measurement, although commonly used, is sometimes questioned.

4. Although some of the important demographic factors were studied in relation to health risk perceptions, health profiles and psychological factors, other demographic factors which may influence health risk perceptions and health profiles of adolescents should be identified by future studies.
CHAPTER II

REVIEW OF LITERATURE

In the last decade there has been a burgeoning of information written about the adolescent years, especially in the area of health. This has been in response to a stronger recognition of the importance of health to adolescent quality of life and future adult health status. This study aimed to contribute to the body of literature in this area by examining the difference in health risk perception and health behaviour of adolescents of similar ethnic background across two different cultural settings and by identifying the possible relationship of selected variables to their health behaviours and health risk perceptions with a view to providing information which may better assist the development of health promotion programs in each setting. Understanding concepts related to Adolescence; Health and the Determinants of Health; Adolescent Health Behaviour and Risk Taking Behaviour; Selected Negative Health Behaviours of Adolescents; Risk, Risk Perception and Perception Bias; and, Selected Psychological Variables Related to Adolescents Health Status were vital to this study. Literature was reviewed under each of these headings in both a general sense and specifically for adolescents. The review has focused on literature from the United States, Australia and Korea. For simplicity of presentation the literature has been organised and presented under topic headings
2.1. Adolescence

The term adolescence comes from the Latin "adolescere" meaning "to grow up" and describes that period of time between the beginning of puberty and the attainment of adulthood. Adolescence has been defined biologically, psychologically and sociologically while being described variously as a stage; a crossroad in life; a transition; and a process (Bennett, 1982; Hurrelmann & Losel, 1990; Hogarth, 1991).

According to the World Health Organisation [WHO] (1984, cited in Kenny & Job, 1995), adolescence has been defined as:

The period of transition from childhood to adulthood . . . characterised (a) by efforts to achieve goals related to the expectations of the mainstream culture; and (b) by spurts of physical, mental, emotional and social development (p. 6).

Crockett and Petersen (1993) explained that:

Adolescence is typically viewed as a transitional period between childhood and adulthood and a time during which young people continue to develop the social and intellectual skills that will prepare them for adult roles and responsibilities (p. 13).
Thus, adolescent development is shaped by the developmental phases that precede and follow it. The notion of adolescence as a period of preparation for adulthood is key because it emphasises the developmental challenges toward which the young person is moving and that shape the social pressures and opportunities encountered along the way (Lerner, 1987).

With respect to the developmental phases in adolescence, the WHO (1993) suggested that adolescence, chronologically, occurs between the ages of ten and 19 years and, youth occurs between 15 and 24 years. Developed countries have extended the nature of adolescence and divided adolescence into three subphases: early adolescence (11-14 years), middle adolescence (15-17 years) and late adolescence (18-20 years) (Millstein, Petersen & Nightingale, 1993).

Regarding the subphases in adolescence, Crockett and Petersen (1993) defined them as:

Early adolescence is the transition from childhood to adolescence and is characterised primarily by puberty. Middle adolescence is the heart of adolescence, in which there is a dominant peer orientation with all of the stereotypical adolescent preoccupations: adolescent music, attire, appearance, language and behaviour. Late adolescence includes the transition to adulthood and ends when the young person takes on adult work roles, marries or becomes a parent (p. 14).

From a medical perspective, Cohen, Litt, Schonberg, Daum and Hein (1974) found that definitions of normal adolescence
focused on chronological age coupled with one of three clinical phenomena. The clinical phenomena are described firstly as endocrine age, related to the onset and termination of puberty and secondly as anthropometric age related to factors such as height, weight or bone age. The third phenomenon is "the onset of a series of psychological behaviours and their satisfactory resolution or psychological age" (Cohen et al., 1974, p. 10).

A broader explanation, beyond that of a clinical context, accepted from a variety of literature and research, is that adolescence may be explained from three perspectives: a physiological, a sociological and a psychological perspective.

The physiological perspective which relates to puberty, with its accompanying increases in sex hormones and changes in body structure and function, is the biological fact of puberty and is relatively unchanged from culture to culture. In both sexes, increases in hormone production lead to the development of reproduction capability and a mature physical appearance. In males, physical changes include pubic hair growth, genital development, voice change and emergence of facial hair. In females changes are associated with pubic hair growth, breast development and menarche (Millstein et al., 1993). However, these changes generally are accompanied, during the developmental processes of adolescents, with efforts at socialisation and the increase and growth of psychological constructs including cognitive and affective skills (B.E. Newman & P. Newman, 1979).
The nature of adolescence is strongly determined by the broader sociocultural context and, for the most part, the journey of adolescence reflects life's larger journey in general (Elder, 1985).

The sociological perspective is important and can be seen when adolescents are described in terms of their status within the society in which they live and adolescent development is examined within the context of social change, social grouping and social growing. Stevens-Long and Cobb (1983, p. 35) reported that social time makes sense of the growing process in terms of the "progress individuals make in passing through society's groups and institutions".

A key social group related to adolescent development is the peer group. Peers can provide a closer bond for adolescents who are trying to loosen ties with parents or family. In addition, relationship with peers during adolescence allows the necessary practise and improvement in skills of interacting with others to enable the individual to have workable and socially-acceptable relationships as adults (Millstein et al., 1993). It is the strong socialisation aspects within the peer group (i.e., peer pressure) and the need to conform to peer behaviours which attract the attention of sociologists, and indeed health educators, as they try to explain adolescence in the sociological paradigm and not really in terms of physiological change.
A psychological perspective describes the way young peoples' behaviours reflect and is reflected by the psychological change process that occurs in adolescence. According to Stevens-Long and Cobb (1983), frequently the psychological approach to the definition of adolescence focused on a variety of psychological tasks, such as cognitive growth, performance in school, personal feelings and social relationships with friends and family during adolescence. However, the development of cognitive capacities reaches a stage where values and beliefs held as true until adolescence, are suddenly questioned and doubted. Elkind (1978) stated that adolescence is the period during which the capacity to acquire and utilise knowledge reaches its peak efficiency. In addition, Petersen (1984) argued that during adolescence almost all aspects of psychological development are effected by biological and social change.

It is clear that definitions of adolescence can be considered from biological, sociological and psychological perspectives. However, whatever position is taken as a starting point, adolescence is a developmental stage synergising biological maturation, enhancement of socialisation and increase of psychological skills. Important outcomes of this synergy are health related behaviours and health status both during adolescence itself and in subsequent years.
2.2. Health and Determinants of Health

The World Health Organisation (1947, cited in Gutin, Manos & Strong, 1992) has defined health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (p. 129). This definition is considered, by many, to have both breadth and depth. It is considered to have breadth because it encompasses the various aspects of health and does not focus on just the physical. The definition is considered also to have depth in that it emphasises the extension of health which ranges from high levels of well-being to states of sickness and morbidity. However, the definition is also considered to be too general; so general in fact as to not be suitable to effectively explain health in today's setting.

In a more recent attempt to explain health, Seedhouse (1986) indicated that:

A person's optimum state of health is equivalent to the state of the set of conditions which fulfil or enable a person to work to fulfil his or her realistically chosen and biological potentials. Some of these conditions are of the highest importance for all people. Others are variable dependent upon individual abilities and circumstances (p. 61).

Seedhouse's is but one of a myriad of definitions which vary from person to person and interest group to interest group. Davis and George (1988) pointed out a number of different factors affect the way individuals and groups viewed, discussed
and defined health. They noted, for example, that those persons with a professional interest in health may develop definitions of health that differ from those of other members of society. Thus, they suggested that specific notions about health and illness are based on a diversity of beliefs and can be affected by any particular society, culture and geography.

It is not just beliefs about health that are interactive according to a plethora of factors. Health status is a function of interrelations within a person, and between the person and their physical and sociocultural environment. Perry (1984) identified four domains of health that were interrelated in the whole person. Figure 2.1 illustrates these domains and their interrelationships.

Figure 2.1 Domains of Health.
As seen in Figure 2.1, the recognition that physical health may be affected by factors in social, psychological or personal health provides a broad focus for discussing the consequences of health behaviours. This is especially relevant to adolescents, where health behaviours are often regulated by particular aspects of each of these domains.

A similar, but more complex, model was presented by Eberst (1984).

Figure 2.2 The Cube Model of Health. Source: Eberst, pp. 100, 1984.

This model has divided health into six dimensions such as physical, emotional, social, spiritual, mental and vocational dimensions. Each dimension is composed of smaller sub-
elements and whenever one element is rearranged the movement affects almost every other sub-element in each dimension. The interactive aspect is clear.

Thibodeau (1983), in keeping with the multifactorial concept, noted that wellness and illness may be conceptualised as a continuum, as co-existent states, or as mutually exclusive or bipolar states. Health is characterised by a point on the continuum.

Boddy (1985) supported the dimensional, interactive notion of health by referring to various aspects of health as intrapersonal, interpersonal, extrapersonal and metapersonal components. Health outcomes are dependent on each of these aspects or factors and the interaction between them. Whilst this concept about health is abstract, it acknowledges the multifactorial interactive nature of health.

Again using the continuum concept, Bouchard, Shephard, Stephens, Sutton and McPerson (1990) pointed out that health is a continuum with positive and negative end points. High positive health is sometimes referred to as wellness or high-level well-being. This could be characterised by positive physical and emotional well-being with high capacity for enjoying life and challenges and possessing adequate coping strategies in the face of difficulties.
Recently, Heaven (1996) in discussing adolescence, described health as a function, not only of one's physical condition, but also of one's attitudes toward health, one's perceptions of risk and the environment. In other words, in keeping with the current definitions of health, Heaven proposed an expanded multifactorial view. Health is an outcome of individual behaviours within a realistic framework of individual potential and a quality of life that involves social, emotional, mental, spiritual and biological fitness on the part of the individual, which result from adaptations to the environment.

In summary, in daily use, 'health' can have either positive or negative connotations. It may refer to vitality, fitness or many other positive facets; similarly 'health', especially 'ill health' may refer to illness, dysfunction, disability or inability to function normally. Health is a contribution to total well being of individuals in every stage of life: social well being; economic well being; life satisfaction; and, spiritual or existential well being.

Considering the various views of health, good health can be described as follows:

Good health implies the achievement of a dynamic balance between individuals or groups and their environment. To the individual, good health means improved quality of life, less sickness and disability, a happier personal, family and social existence and the opportunity to make choices in work and recreation (The Better Health Commission, 1986, cited in Davy, Parker & Patterson, 1992, p. 5).
In the mid 1970s, the Lalonde Report (Lalonde, 1974) identified health as an outcome of the interaction of genetics, lifestyle factors, environmental factors and access to health care. The Centers for Disease Control in Atlanta quantified the contribution of these factors to health status (The Centers for Disease Control, 1977).

Later, in the mid 1980s, the importance of social factors was recognised as a major contributor to health status. Such elements included psychological, cultural, educational and economic factors (Syme, 1986; Last, 1987). Despite lack of clarity about causal mechanisms, previous work, especially in the United Kingdom, stimulated discussion about the multi-causal nature of health inequalities with a focus on social factors (Townsend & Davidson, 1982). The Ottawa Charter (WHO, 1986), a key document concerning the development of health promotion strategies aimed at raising health status, recognised the importance of social and cultural factors in influencing the capacity of individuals to improve their health.

Recent literature has combined the concepts of the Lalonde Report with increased recognition of social factors. A model developed by Evans and Stoddart (1990) acknowledged the complexities and realities of the determinants of health behaviour.
This model recognised that people have their behaviours modified by their environment in the broadest sense of the word. Many health professionals are considering the effects on health of social, economic and physical factors with the aim of altering them to sustain healthy living.

In doing so, however, the role of individual behaviour cannot be ignored. Behavioural factors are still regarded as being of prime importance in determining health status. As such, any step towards understanding health behaviour is important. This is especially true for adolescents where the complexities are not known, let alone understood.

The following section identifies personal behaviours as one of the key factors in maintaining and improving health status.
Health behaviour is a complex process, especially when it involves changing negative behaviours into positive ones. Health behaviours are determined by knowledge, beliefs, values, family, peers, skills or the interaction between these factors.

2.3. Adolescent Health Behaviour and Risk Taking Behaviour

As has been explained, health is a function of health related behaviour, and the WHO (1989) noted that, in an effort to improve the health status of population groups, attention has been turned towards those problems that arise from specific health behaviours.

The study of health behaviours is important for two major reasons: a substantial proportion of the mortality tends to be caused by particular behaviours and these behaviours are modifiable (W. Stroebe & M.S. Stroebe, 1995); and, recognition that individuals can make major contributions to their own health and well-being through the adoption of particular health-enhancing behaviours (e.g., exercise) and the avoidance of other health-threatening behaviours (e.g., smoking) (Millstein, Petersen & Nightingale, 1993).

Although behaviours in general have been the subject of extensive research, only recently has the relationship of health
behaviours to other factors, especially cognitive psychological factors, been explored.

Kasl and Cobb (1966) defined health behaviour as:

any activity undertaken by a person believing himself to be healthy for the purpose of preventing disease or detecting it at an asymptomic stage (p. 246).

Gochman (1988), as well as outlining the underpinning of behaviour, defined health behaviour as:

Those personal attributes such as beliefs, expectations, motives, values, perceptions and other cognitive elements; personality characteristics, including affective and emotional states and traits; overt behavioural patterns, actions and habits that relate to health maintenance, to health restoration and to health improvement (p. 3).

Donatelle and Davis (1994) indicated that health behaviour is a broad spectrum of human thoughts and actions.

Today, health behaviours range from health-promoting behaviours, such as regular exercise and proper eating; health-protecting behaviours, such as health screening, immunisation against disease and condom use to negate the threat of AIDS; and avoidance of health-endangering behaviours, such as smoking, excessive alcohol consumption and unsafe driving practices (Millstein et al., 1993).
All people, including adolescents, engage in health behaviours. And, the goal of health educators and health promoters is to ensure that, as often as possible, people engage in health promoting or positive health behaviours, no matter where they may be situated on a health continuum. However, in reality not all people engage in positive health behaviours. People often behave in ways which clearly detract from their health status or place their health status at risk.

Health behaviour may be extensively changed according to social, psychological and cultural factors. Such changes can be difficult to handle. This is particularly true during adolescence when young people often engage in negative health behaviours that may lead to morbidity and mortality.

Negative health behaviour, often termed risk-taking behaviour, is a commonly identified aspect of adolescence as young people gain greater independence, develop new social relationships and experiment with new forms of behaviour. Risk-taking behaviour can have negative health outcomes that are immediately and directly related to the behaviour (e.g., drink driving leading to car accidents); indirectly related to the behaviour (e.g., cigarette smoking); or, which may have both immediate and long-term consequences (e.g., unprotected sexual intercourse).

Baumrind (1987) argued that the same behaviour may represent a serious risk for one individual and relatively minor
risk for another. He also noted that not all risk-taking behaviour is negative and taking risks in controlled, positive environments may contribute to the healthy development of adolescents. Some behaviours, however, are clearly associated with a much higher likelihood of negative health outcomes.

A feature of the research regarding health behaviour and adolescents is that specific negative health behaviours are frequently investigated in isolation from other behaviours and sometimes in isolation from the physical and social environment which contribute to them (Penny et al., 1994). This approach to studying negative adolescent health behaviours may not provide full explanations about the important relationships between behaviours which become apparent in the examination of a range of negative health behaviours.

Jessor (1984) suggested that problem health behaviours do not exist in isolation but are associated with each other and highlights the important relationship between behaviours. The following summarises Jessor's finding about problem behaviours:

Firstly, risk behaviours, in some way, associated within the adolescent's social context - as one behaviour is associated with another it suggests that there are socially organised opportunities to learn and practice them together. Secondly, different risk behaviours may share an underlying psychological and/or social meaning so they each serve a similar function for the adolescent. Finally, it suggests that adolescent health behaviours may best be conceived
as constituting a lifestyle rather than as isolated behaviours (p. 79-83).

In addition, Jessor and Jessor (1975) argued that adolescent risk-taking behaviour is any activity that deviates from social norms. They reported peer influence as a major factor related to risk taking of adolescents and indicated that,

--- in general, young people who engage in high-risk behaviour acknowledge to perceive greater support for their risk-taking behaviour from friends and also report having more friends who engage in such a behaviour (p. 7).

To identify what factors are related to actual participation in high-risk activities, one study using the psychometric paradigm by Severson, Benthin and Slovic (1989) revealed several differences between the risk perception of those who participate and do not participate in the risky events. Participants generally report,

--- greater knowledge of risks, less fear of risks, less personal risk, less risk to peers, greater benefits relative to risks, less seriousness of effects, more personal control over risks, greater peer influences, less desire for regulation, less ability to avoid the activity and higher perceived participation rate (p. 6).

These findings, therefore, imply that actual participation in high-risk activities is connected to very discrete cognitive, social and personality factors.
Benthin, Slovic and Severson (1993) argued that young people who engage in one form of risk-taking behaviour, such as excessive use of alcohol, are relatively more likely to engage in another risk behaviour such as smoking cigarettes. These results are consistent with previous studies addressing the issue of interrelated rather than independent behaviours (Donovan & Jessor, 1984; Jessor, 1984; Biglan et al., 1990).

Clearly, one risk behaviour of adolescents is likely to correlate with other behaviours. Risk behaviours are not prioritised and clearly defined, but are rather blurred, as factors from one or more risk behaviours impinge on other risk behaviours.

2.3.1. Cultural Differences in Risk Taking Behaviour

In a social perspective, the importance of culture in adolescent risk behaviour has started to gain broad attention. Culture as a key factor affecting or shaping health behaviour and risk perception has been referred to as

... shared values, norms and codes that collectively shape a group's beliefs, attitudes and behaviours through their interactions in and with their environment (Airhihenbuwa, 1994).

Within such a definition Airhihenbuwa (1995) indicated that cultural beliefs and values can play a crucial role in variation
of risk perception and health behaviour, and eventually contribute to health outcomes.

In a study which investigated knowledge, attitudes and misconceptions about AIDS among adolescents in different cultural backgrounds, DiClemente, Boyer and Morales (1988) indicated that White adolescents reported higher scores on the effectiveness of condom use as a method for reducing the risk of disease transmission during sexual intercourse, compared with Black and Latino adolescents. Meanwhile, Blacks were almost and Latinos were more than twice as likely than Whites to have high levels of knowledge misconceptions concerning AIDS. The study suggested that adolescents, particularly, Black and Latino adolescents may be at greater risk of HIV infection as a consequence of engaging in unsafe sexual practices attributable to insufficient knowledge and a lack of useful information which could be discussed as a function of their culture.

Jepson, Kessler, Portnoy and Gibbs (1991) supported the notion of cultural difference when they reported on cancer prevention behaviour and knowledge between Blacks and Whites. The results noted that Blacks had significant differences in rates of diet change, stool blood testing and smoking differences which were essentially confined to men. Additionally, results indicated that Blacks scored lower than Whites on cancer knowledge measures, and were less likely to believe that cancer was preventable. Therefore, this study concluded that
the behavioural differences of Blacks in cancer prevention activities were caused by the knowledge discrepancies.

One study concerning depression of students in the various cultural settings by Crittenden, Fugitta, Bae, Lamug and Lin (1992) revealed that Korean students appeared to have higher self-reported frequencies of depressive symptoms than students in U.S., Philippines and Taiwan. This was consistent with the result of study by Crittenden and Fugitta (1987), reporting that Korean students showed a more depressive attributional style compared to students in the United States, Taiwan and the Philippines. This typical Korean pattern is considerably and more culturally approved by Korean respondents than the self-enhancing pattern defined as protective against depression. These results concluded that the culturally approved and characteristic depressive attributional style and a high level of depression comprise a consistent cultural cluster among Koreans, and it may be that distinctive features of Korean culture predispose Koreans to depressive illness.

In addition, a study by Domino and Regmi (1993) examined attitudes toward cancer using the Cancer Metaphors Test (CMT) reported that Nepalese students tended to see cancer both more pessimistically and more optimistically than did American students. They also indicated that these cultural differences may be caused by psychological variables. This suggestion supported the result of studies (Lefcourt, 1981;
Weisz, Rothbaum & Blackburn, 1984), indicating that U.S. students are more internally oriented and perceive a greater control over external events than do Nepalese students.

Cooper, Peirce and Huselid (1994) investigated the prevalence of alcohol and risk behaviour across Black and White adolescents in the U.S. and indicated that White adolescents tended to drink alcohol significantly more than Black adolescents. The results revealed that Whites were substantially more likely than Blacks to drink proximal to intercourse. The authors argued that Whites were significantly more likely to have sexual intercourse with drug use, and concluded that drug use was both more common and more strongly linked to risk taking Whites than Black adolescents, suggesting a cultural difference existed between Black and Whites.

Schwartz (1996) investigated the differences in sexuality and HIV/AIDS education between Swedish and American female students. All Swedish samples received a minimum of two class session for sexuality education, with more than half the students receiving ten or more sessions. By comparison, in the United States, 12 percent of students reported that they received no sexuality education, and 27 percent of students reported receiving ten or more sessions. The author suggested a reason for the difference was the cultural aspects of sexuality. This study found that there was a significant difference between Swedish and American students regarding
contraceptive use during first coitus, indicating that the Swedish students had a substantially higher overall rate of oral contraceptive use, as well as a higher rate of condom use.

Recently, Edman and Kameoka (1997) investigated illness attribution between American and Filipino students. The findings revealed that Filipino students tended to attribute illness to a number of causes such as witchcraft, sorcery and virus, meanwhile the American students had beliefs that illness mainly depends on individuals' ability to control their behaviour and perception. The study suggested that illness concepts were learned through formal education and prior experiences, and had implications for health educators and health prevention programs designed to serve various cultural groups.

Most people, in general, live in various risk situations and sometimes engage in the risky behaviour. Adolescents as a key group in the formation of healthy behaviour are likely to experiment with new forms of risky behaviours. In relation to this, it is broadly accepted that much morbidity and mortality of adolescents today is mainly caused by their negative risk behaviours which may be related to psychological variables and cultural settings.
2.4. Selected Negative Health Behaviours of Adolescents

It has been clearly accepted that the role of health behaviour in determining health status is crucial. Given that health behaviour can have both immediate impact and long-term implications; especially during adolescence. Certain negative behaviours of adolescents can lead to a significant increase in the risk of morbidity and premature mortality.

There are a variety of ways that these adolescent behaviours may be examined and discussed. Some authors have categorised them according to their psychological bases while others have reviewed them from a sociological perspective. Most commonly, however, adolescent behaviour is discussed according to morbidity and mortality associations and statistical categorisation.

In 1993, Singer, Singer and Anglin indicated, in the United States, accidents, homicide and suicide are the three leading causes of mortality among adolescents, and are all largely preventable and directly related to psychological and developmental issues. Additionally, health risks of adolescents are closely associated with sexually transmitted diseases, HIV/AIDS, substance abuse, mental and emotional disorders, gang involvement and physical and sexual abuse. It is these categories that are often used for the purposes of discussion and categorisation.
In Australia, a large body of research identified similar problems and discusses adolescent health accordingly. Burkinshow (1986) organised health problems of adolescents into four categories: biological issues, risk taking behaviours, sexually related behaviours and emotional problems. Recently, Kenny and Job (1995) noted that the leading causes of adolescent mortality and morbidity in Australia were road crashes, suicide, injuries, psychological problems, sexually related problems, alcohol and drug abuse, smoking and eating disorders.

A review of literature clearly indicates a categorisation according to health domain to be acceptable and the most often discussed domains are those associated with Accident Related Behaviours; Sexually Related Behaviours; Substance Use and Abuse Behaviours; Mental Health Behaviours; and Nutrition Behaviours. Aspects of adolescent involvement in each of these areas are reported in this chapter using the results of survey research, morbidity statistics and mortality data from the United States, Australia and Korea.

2.4.1. Accident Related Behaviours

The literature on adolescent behaviour and health reveals accidents as the major risk factor threatening adolescent health status. Accidents are a leading cause of mortality and
morbidity. U.S. studies conclude that accidents account for 20 percent to over 60 percent of deaths among young people with generally higher rates among American males (Hurrelmann & Losel, 1990; Nutbeam, Farley & Smith, 1990).

Figure 2.4 shows a comparison of causes of death in young people aged from 15 to 24 years in the United States between 1979 and 1991 (National Centre for Health Statistics [NCHS], 1993).

According to Figure 2.4, although there was a 33 percent reduction in mortality in this age group between 1979 and 1991, unintentional injuries was still the leading cause of death
for young people, accounting for over 42 percent of all deaths (NCHS, 1993).

In a more recent study, Lescohier and Gallagher (1996) reported, among the US adolescents aged ten to 19 years, 59 percent of deaths were caused by unintentional injury. They also found that the proportion of deaths attributed to accidents differed according to age. Almost 75 percent of injury deaths in the younger group aged ten to 14 years were caused by accidents as compared with 56 percent among older adolescents aged 15 to 19 years.

It is broadly recognised that traffic-related accidents were the key cause of unintentional injury death in the United States. The National Safety Council [NSC] (1993) reported that 78 percent of all injuries among young people were attributable to car accidents, with males accounting for three-fourths of these deaths.
Aspiration
Suffocation
MV Bike
Fall
Fires/Burn
Poisoning
Unintent Firearm
MV pedestrian
Drowning
MV Other
MV Occupant

Figure 2.5 Number of Adolescent Deaths by Cause, 1991: By Age (10-14 and 15-19).

As seen in Figure 2.5, approximately 62 percent of adolescent deaths for males aged ten to 14 years were caused by car-related accidents (32 percent for car occupants and 16 percent for pedestrians), meanwhile for older adolescents aged 15 to 19 years, the car related deaths captured approximately 59 percent including 23 percent for car occupants and 12 percent for pedestrians.

Drowning ranked as the third most common cause of accident related death. According to Figure 2.5, in 1991 13 percent of deaths in adolescents aged ten to 14 years occurred by drowning and this increased to 15 percent of deaths for adolescents in the age of 15 to 19 years.
In addition, firearms were the cause of nine percent of deaths in adolescents aged ten to 14 years, followed by fire with seven percent of fatal cases, falls with three percent and poisoning with two percent. In older adolescents aged 15 to 19 years, 11 percent of deaths attributed to firearms and the following causes were poisoning with six percent of deaths, fires with four percent and falls with three percent.

Sports-related injuries were the most frequent causes of adolescent morbidity in the United States. Malek, Chang, Gallagher and Guyer (1991) indicated that the overall rate of sports injuries in younger adolescents in the age of ten to 14 years was 25 percent, followed by falls with 21 percent, being struck by an object with 16 percent and cutting and piercing instruments with 12 percent. Meanwhile, older adolescents aged 15 to 19 years were injured from sports with 21 percent, cutting and piercing with 14 percent, struck by an object with 14 percent and falls with ten percent.

Australian statistics for 1991 reported that adolescent deaths caused by injuries increased according to age, ranging from approximately 44 percent in younger adolescents (ten to 14 years) to 69 percent for older adolescents (15 to 19 years). In addition, in younger adolescents male deaths by injuries were about 56 percent and females were 32 percent, meanwhile for older adolescents males were about 80 percent and females were 58 percent (Commonwealth Department of Human Services and Health [CDHSH], 1994a).
Among adolescent deaths attributed to accidents in Australia, car accidents were the leading cause of death for 1989-90. Oldenburg, Ffrench and O'Connor (1995) reported that death due to car accidents for young people aged ten to 14 years was 30 percent for males and 14 percent for females in all deaths. This increased to 41 percent for males and 36 percent for females for the ages 15 to 19 years. According to CDHSH (1994a), of road fatalities of adolescents in the age of ten to 14 years, in 1990, 44 percent were pedestrian deaths and 35 percent were car occupant deaths. Meanwhile, for older adolescents aged 15 to 19 years most fatalities were attributed to car occupants with 67 percent and motorcyclists with 17 percent.

Similar to the U.S. and Australia, accidents are a leading cause of adolescent deaths in Korea. According to the Ministry of Culture and Physical Education, in 1995 the death rates attributed to accidents increased with age, ranging from 20 percent for children and adolescents aged five to 14 years to 48 percent for 15 to 24 year olds.

The Ministry of Culture and Physical Education (1996), in addition, reported that the mortality rates of young people caused by traffic-related accidents steadily increased from six percent in 1993, through seven percent in 1994 to eight percent in 1995. In contrast, for early adolescents (ten to 14
years) the deaths associated with traffic accidents slightly decreased from ten percent in 1993 to eight percent in 1995.

Data available indicated car accidents were clearly the most prevalent and the most serious in terms of morbidity and mortality. Researchers in the U.S. and Australia commented as to the possible underlying causes of car accidents. Hurrelmann and Losel (1990) noted that car accidents may be related to extreme risk taking behaviour and use of drugs and alcohol. In an American study, Hingson and Howland (1993) indicated that adolescent drivers were significantly more likely than adult drivers to report that they speed, run red lights, make illegal turns, not wear safety belts and drive after heavy drinking or drug use. Lescohier and Gallagher (1996) also reported that approximately 59 percent of all injuries by car accidents were generally associated with several factors: driving at night, drink driving, speeding and other traffic violations.

Research indicated adolescents generally tended to view preventive measures such as increased speeding enforcement, raising the drinking age, lower blood alcohol limits for younger drivers, using lights in daytime, or rear seat belts as less effective in reducing deaths or injury related to car accidents (Jonah & Dawson, 1987).

Risk driving behaviour of adolescents may be explained from a social and psychological perspective indicating adolescents generally tended to have lower perceived risk of car accidents
(Hingson & Howland, 1993). Adolescents undergo a social learning process that ultimately leads to over-confidence in their perceived driving abilities. The more young drivers travelled without experiencing car accident, the more they may come to believe that they were better than other drivers (Job, 1990). Another factor related to unsafe driving may be adolescents’ desires and needs to impress their peers and gain social acceptance. Peer group pressure is sometimes closely related to adolescent drivers’ unrealistic confidence, high-speed driving and even driving after drinking or drug use (Job, 1990).

The literature indicates the importance of accidents in terms of adolescent mortality and morbidity. Negative health behaviours are often related to accident occurrence and underlying factors associated with these health behaviours may well be related to psychological and behavioural variables such as perception of risk, self-esteem and other health behaviours which are a focus of this study.

2.4.2. Sexually Related Behaviours

A person's sexual activity is everything that makes that person a sexual being. It goes beyond the biological aspect of behaviours and includes all those experiences, attitudes, feelings and reactions that relate to being male or female. It is generally accepted that many adolescents become involved in
sexual behaviours that range from holding hands and kissing through petting to intercourse. However, for the purposes of this discussion, sexual activity is simply defined as a term associated with the physical act of sexual intercourse because it is through that activity that the health risks may ensue. This engagement of sexual activity increases the health risks which include sexually transmitted diseases [STDs], Acquired Immune Deficiency Syndrome [AIDS], unplanned pregnancy and abortion, making sexual behaviours of adolescents one of the most significant and immediate risks to their health status.

Surveys in the United States, based on large samples, estimated that by 17 years of age, approximately 50 percent of young people were sexually active (Howard, 1988; Kulbok, Earls, Felton & Montgomery, 1988). More recently, the Centers of Disease Control [CDC] (1992a) confirmed this report suggesting that approximately 54 percent of ninth to 12th graders engaged in sexual intercourse with almost 40 percent within the previous three months.

In a recent Australian study regarding sexual activity of school students by Dunne et al. (1994), sexual intercourse was reported to range from ten percent for those aged under 13 years, to 24 percent at age 15 and 51 percent at age 17 years and over. Furthermore, senior students with sexual experience reported having three or more partners in the previous year. Of those surveyed in the 17 years and over category, males were 26 percent and females were 18 percent.
In 1996, the Korea Planned Parenthood Federation indicated that 16 percent of male students aged 17 to 19 years had engaged in sexual activity. Sexual intercourse was reported to range from 12 percent for students at 17 years to 20 percent for those aged 18 years to 17 percent at age 19 years.

Sexually transmitted diseases in adolescents can be classified by illness syndromes or by specific disease agent which most often include those listed in Table 2.1.

Table 2.1
Sexually Transmitted Disease Syndromes in Adolescents

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Infectious agent</th>
</tr>
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<tbody>
<tr>
<td>Urethritis</td>
<td>Neisseria gonorrhoea</td>
</tr>
<tr>
<td></td>
<td>Chlamydia trachomatis</td>
</tr>
<tr>
<td>Vaginitis/Cervicitis</td>
<td>Trichomonas vaginalis</td>
</tr>
<tr>
<td></td>
<td>N. gonorrhoea, C. trachomatis</td>
</tr>
<tr>
<td>Genital ulcers</td>
<td>Herpes simplex</td>
</tr>
<tr>
<td>Syphilis</td>
<td>Treponema pallidum</td>
</tr>
<tr>
<td>Chancroid</td>
<td>Haemophilus ducreyi</td>
</tr>
<tr>
<td>Pelvic inflammatory disease</td>
<td>N. gonorrhoea</td>
</tr>
<tr>
<td></td>
<td>C. trachomatis</td>
</tr>
<tr>
<td>HIV/AIDS</td>
<td>Human immunodeficiency virus</td>
</tr>
</tbody>
</table>

Source: D'Angero and DiClemente, pp. 334, 1996.

In the U.S., Kroger and Wiesner (1981) noted that the incidence rates of STDs among adolescents markedly increased in the years 1960-1980 and it was estimated that in 1980, one out of four of all STD victims were infected before leaving high school. In a more recent years, Webster, Berman and Greenspan (1993) indicated that although the total number of cases of gonorrhoea reported between 1981 and 1991 decreased, the
rates of gonorrhoea in male adolescents aged 15 to 19 years actually increased and the rate of female adolescents decreased.

In Australia in 1992, approximately 27 percent of male and 50 percent of female adolescents and young people in the age of 13 to 24 years were infected with gonorrhoea. Thirty one percent of male and 43 percent of females were diagnosed with hepatitis infections, and 40 percent of male and 67 percent of females were reported as having non-specific urethritis or genital chlamydia infection (CDHSH, 1992).

The AIDS epidemic, now well into its second decade, has relentlessly expanded in scope and magnitude since 1981, when the disease was first recognised. In this regard, it is important to note that one of the primary risk groups for AIDS is adolescents. Although there are other major risks for AIDS other than sexual activity (e.g., coagulation disorders and intravenous drug) sexual intercourse, particularly homosexual intercourse is important.

In the U.S., a report complied by the Centers for Disease Control (1992a) showed that the number of cases of AIDS among the 13 to 19 years of age group increased by 30 percent between 1989 and 1991. Additionally, 20 percent of the AIDS patients were between the ages of 20 and 29, most of whom acquired the disease during adolescence. Because the incubation period for the virus is ten years or more, it is reasonable to suppose
that the majority of these people were infected during their teenage years. As a result, AIDS is now the sixth leading cause of death among those 15 to 24 years of age (NCHS, 1993, cited in Sells & Blum, 1996).

Figure 2.6 AIDS Cases in Adolescents under the Age 13-19.
According to Figure 2.6, the U.S. Department of Health and Human Services [U.S. DHHS] (1994) indicated that, among male adolescents, the three previously mentioned causes captured 84 percent of cases. Meanwhile, female adolescents aged 13 to 19 years were reported as having heterosexual contact with 52 percent, intravenous drug use with 20 percent and coagulation disorders with 17 percent as the leading causes of AIDS transmission.

According to the recent statistics for AIDS in Australia, since 1984 young people under 20 years of age have been diagnosed HIV positive and approximately 20 percent of AIDS cases and 19 percent of AIDS deaths occurred in people aged 20 to 29 years (National Centre in HIV Epidemiology and Clinical Research, 1992). It is reasonable to assume that negative health behaviours in adolescents were contributory to this mortality.

Similar to the American statistics, the leading cause of HIV transmission in Australia is homosexual intercourse between males accounting for 81 percent of cases, followed by heterosexual contact with six percent of cases, intravenous drug use accounts for five percent of cases, homosexual contact with three percent of cases and coagulation disorder with two percent of cases (National Centre in HIV Epidemiology and Clinical Research, 1994).
AIDS cases in Korea have displayed similar characteristics to Australia and the United States (see Table 2.2).

### Table 2.2
AIDS Cases in Korea

<table>
<thead>
<tr>
<th>Category \ Year</th>
<th>'87</th>
<th>'88</th>
<th>'89</th>
<th>'90</th>
<th>'91</th>
<th>'92</th>
<th>'93</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total infection cases</td>
<td>14&lt;sup&gt;a&lt;/sup&gt;</td>
<td>22</td>
<td>37</td>
<td>54</td>
<td>42</td>
<td>76</td>
<td>78</td>
<td>323</td>
</tr>
<tr>
<td>AIDS patients</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>16</td>
</tr>
</tbody>
</table>

<sup>a</sup> '85 : 1, '86 : 4, '87 : 9

When grouped according to age, the group 20-29 have the greatest prevalence of cases. Again, it may be reasonable to assume risk taken in adolescence contributed to the health problem (MHSA, 1993, cited in Jo et al., 1996).

Another health risk associated with adolescent sexual activity is unplanned pregnancy which has become a source of increasing social and economic concern in most countries. According to several studies in the United States (Zabin & Clark, 1983; Stephenson, 1989; Kolbe, 1992), 50 percent of all adolescent pregnancies occur within the first six months after initial intercourse and, prior to their 20th birthday, four out of ten adolescent females become pregnant. One study by Henshaw (1994, cited in Stevens-Simon & McAnarney, 1996) pointed out that in 1989, 1,043,600 female adolescents under the age of 20 became pregnant, about 50 percent gave birth, 37
percent had legal abortions and an estimated 14 percent miscarried.

Abortion is legally accepted in many developed countries and in 1993, abortion rates among adolescent females aged 15 to 19 years were 53 percent in the U.S. (The Alan Guttmacher Institute, 1994). According to the U.S. statistics (CDC, 1992b), in 1989 abortion rates in the adolescent group aged less than 20 years occupied approximately 24 percent of all abortions. In addition, as increasing age abortion rates of the adolescent group decreased from 46 percent for young adolescents aged less than 15 through 38 percent at age 15 to 17 years to 36 percent at age 18 to 19 years.

In 1989, statistics for South Australia showed that among all pregnancies, approximately 18 percent ended in abortion. In the case of adolescents, approximately 50 percent of adolescent pregnancies were terminated as a result of abortion (Australian Institute of Health and Welfare [AIHW], 1994). In addition, according to the South Australia Health Commission (1994), among all pregnancies in 1994, adolescents under 19 years occupied 20 percent. This study also indicated that of all abortions and births in South Australia, adolescents accounted for approximately 20 percent of the abortions and 5 percent of the births.

Although all adolescent pregnancies may not be troublesome, there is evidence that it is frequently accompanied by physical
and psychological problems. Physical complications of pregnancy can include: nutritional deficits, anaemia, urinary tract infections, uterine dysfunction and congenital abnormalities. These complications, alone or in combination, can lead to premature delivery, low birth weight babies and the concomitant problems associated with these babies (Levine & Valle, 1982; Blum, 1987; Siedlecky, 1987; Davis, 1989).

Psychological problems such as anxiety, guilt and depression may develop as a consequence of forced marriage, single parenthood, adoption or abortion. In addition, the maternal-infant relationship may require intensive care for some time, as the demands and tasks of motherhood occur before the mother has completed her own physical and emotional growth (Davis, 1989; Carver, Kittleson & Lacey, 1990).

Adolescent fathers, an often neglected group, are frequently viewed with anger and resentment by the girl's family. They may be liable for a criminal charge and sometimes forced into a marriage that is associated with social and economic disadvantages and subsequently, a high failure rate (McAnarney & Greydanus, 1989).

Sexual behaviour of adolescents has been viewed as a moral issue and this perspective has recently been broadened to include social and cultural considerations. According to Brooks-Gunn and Paikoff (1993), the motives for sexual intercourse in adolescence can differ somewhat from those of adults.
Involvement of adolescents in sexual activity is influenced by situational pressures, such as peer pressure from the same or opposite sex; curiosity; sexual gratification; family like parental behaviour; culture; religion and, media. Juhasz and Sonnenshein-Schneider (1987) argued that much of adolescents' sexual intercourse was unrelated to their real developmental needs and interests. Young people will continue to experience sexual curiosity and engage in sexual activity and unsafe sexual activity will continue to considered a health risk behaviour.

2.4.3. Substance Use and Abuse Behaviours

Within a contemporary context, adolescent substance use and abuse is often described in simplistic terms. It is however, a complex problem created and often maintained by a host of factors. Currently, it is true that many adolescents have some experience with alcohol and/or other substances and many personal and social problems are related to their use. Although the types of substances and the prevalence of use are constantly changing, many adolescents experiment with one or more substances.

Alcohol is the most commonly used and abused substance by adolescents and alcohol use is also one of the major causes of violent crime and road accidents. Drug use is associated with
poor social functioning and crime (CDHSH, 1994b). In addition, according to Davy et al. (1992), alcoholism and drug addiction can seriously disrupt work efficacy, social life and family life and eventually damage the victim's quality of life.

In the United States, research has concluded that adolescents' absolute rates of self-reported drug use risk behaviours were high. (National Adolescent Student Health Survey, 1988, cited in Quadrel, Fischhoff & Davis, 1993) This survey revealed that 17 percent of high school students reported having used alcohol or drugs during the preceding year and 26 percent of eighth graders and 38 percent of tenth graders reported having had five or more drinks on at least one occasion during the preceding two weeks.

The American School Health Association [ASHA] (1989), Johnston, O'Malley and Backman (1991) and Bush and Iannotti (1993) examined the lifetime prevalence of alcohol use for four different levels of students (Figure 2.7).
As seen in Figure 2.7, about one-half of the fourth grade students had already used alcohol at least once. The alcohol prevalence of eighth grade students increased to almost 76 percent, and by tenth and 12th grade the prevalence is 87 percent and 89 percent, respectively. The results of these findings can be interpreted as the early onset of alcohol use being common among a large number of adolescents.

In terms of drug use of adolescents, in 1988, the University of Michigan surveyed high school students aged 14 to 17 years. Results of the survey indicated that a variety of drugs were used by adolescents at a high rate, with marijuana being the most prevalent (33 percent for "ever used" and 18 percent for "regularly used"). In addition, 11 percent of adolescents had
tried stimulants, eight percent for cocaine and five percent for LSD (Allen-Meares, 1994).

Johnston et al. (1994) investigated the prevalence of illicit drug use among high school students. The results showed that, since peaking in 1979 the prevalence of illicit drug use declined from 39 percent in 1979 to 18 percent in 1993, but that there were significant increases in marijuana, stimulant, LSD and inhalant use at all age groups.

In Australia, the New South Wales School Drug Survey examined alcohol and drug use of adolescents (Figure 2.8).
As seen in Figure 2.8, the findings reported that regular consumption of alcohol of adolescents aged 12 to 16 years continued to decline for both sexes between 1983-1992 from 32 percent of girls and 33 percent of boys to 16 percent of girls and 20 percent of boys. However, cannabis use of adolescents increased, among boys, from seven percent in 1983 to ten percent in 1992. It slightly decreased, among girls, from approximately six percent in 1983 to approximately five percent in 1992 (NSW Department of Health, 1993).

The National Drug Strategy [NDS] in 1992 conducted a study of alcohol and drug use patterns amongst secondary school students in Victoria, Australia. According to this study, 68 percent of students aged 12 to 16 years reported that they
used alcohol; 48 percent of students were monthly drinkers; and, 28 percent used alcohol weekly (CDHSH, 1994c). Moreover, the prevalence of monthly alcohol use significantly increased according to age, ranging from 21 percent for adolescents at 12 years through 44 percent for the age 13-15 years to 69 percent for adolescents aged 16 years. In terms of drug use, among adolescents age 12 to 16 years, 25 percent of adolescents had ever used inhalant and 23 percent had ever used marijuana. In marijuana use the proportion increased from five percent for adolescents at 12 years, to 20 percent for the age of 13 to 15 and 40 percent for 16 years (CDHSH, 1994c).

In Korea, the number of adolescents who have experienced drinking alcohol has steadily increased. One study related to alcohol use of high school students by Cha (1994, cited in Go & Han, 1995) indicated that 76 percent of male students and 68 percent of females reported having ever drinking alcohol and even, in the elementary school, 36 percent of boys and 21 percent of girls had ever experienced drinking alcohol.

In addition, Lee (1994) investigated the time of onset of alcohol experimentation and consumption. The results noted that most students experimented with alcohol use in elementary and middle school (30 percent and 42 percent, respectively) and ten percent of cases reported having consumed alcohol before school age. These figures are much higher than those of other countries and imply that alcohol use of adolescents should receive much more social attention in Korea.
In the case of drug use, although Korean adolescents are relatively less exposed to drug risk than adolescents of other countries, the rate of adolescent mortality and morbidity caused by drug use has steadily increased and some negative issues related to drug use of adolescents have raised serious social issues in Korea.

Kim (1995) investigated the prevalence of drug use among high school students aged 13 to 18 years. The results showed that younger students aged 13 to 15 years have ever used analgesics with 18 percent, narcotic with four percent, tranquilliser with three percent and stimulant with two percent and, for older students in the age of 16-18 years, analgesics with 29 percent, narcotics with six percent, stimulant with four percent, tranquillisers with three percent and sedative with three percent. Furthermore, female students tended to report higher prevalence in drug use than males. Twenty six percent of females used analgesics, six percent narcotics, four percent tranquillisers and three percent stimulants. Males reported 21 percent used analgesics, four percent narcotics, three percent tranquillisers and two percent stimulants (Kim, 1995).

Smoking is a behaviour that is often initiated during the adolescent years and has been recognised as an important cause of preventable morbidity and premature death. Smoking is highly addictive and regular smoking during adolescence
develops into nicotine dependency. This behaviour is likely to continue to adulthood, increasing the likelihood of long-term adverse health outcomes such as lung cancer, respiratory disorders and cardiovascular disease.

In the United States, according to the Teenage Attitudes and Practices Survey [TAPS] and The Monitoring the Future Study [MTFS], approximately 66 percent of adolescents had smoked cigarettes by age 18 and, in 1989, the national prevalence of current smoking for adolescents aged 12 to 18 years was 16 percent (Perry & Staufacker, 1996). In addition, similar to previous research, 22 percent of TAPS and 40 percent of MTFP students reported that they had smoked their first cigarette by age 14 among 12th grade students.

Previously, Johnston et al. (1994) reported prevalence of daily smoking by grade (Figure 2.9).
As seen in Figure 2.9, daily smoking rates among high school seniors steadily increased with grade level from eighth grade with eight percent, tenth grade with 14 percent to 12th grade with 19 percent. Even though the differences by gender were not significant, male students tended to smoke slightly more cigarettes than female students.

In Australia, since 1989, daily or occasional smoking rates of Australian adolescents increased from 13 percent to 17 percent for males and from 17 percent to 22 percent for females. According to most recent national statistics, smokers aged 16 to 19 years were reported as 20 percent for males and 31 percent
for females (Australian Institute of Health and Welfare [AIHW], 1994).

A recent Australian survey by the New South Wales Department of Health (1995), reported the early onset of smoking in smoking trends of students (Figure 2.10).

![Figure 2.10 Trends in Smoking 1986-1993](image)


The survey of primary school students in years five and six concluded that almost 30 percent of boys and 20 percent of girls had ever smoked a cigarette. Also, as seen in Figure 2.10, although the proportion of year five and six students who had ever smoked a cigarette declined since 1986, the percentage of regular smoking increased from three percent in 1986 to five percent in 1993 across all ages and sex (NSW Department of Health, 1995).
The Korea Association for No-Smoking Movement (1992) reported that most smokers generally started smoking during adolescence and sometimes even earlier. This study also indicated that the smoking rates of young adolescents aged from 13 to 15 increased from two percent in 1988 to three percent in 1991 and the smoking rates for older adolescents, aged 16 to 18 years, greatly increased from 24 percent in 1988 to 32 percent in 1991.

In a more recent study comparing the proportion of smoking between male and female students who have ever smoked, the Conversation Plaza for Youth (1993, cited in Korea Institute for Youth Development [KIYD], 1995) indicated that 68 percent of male students and 21 percent of females had ever experienced smoking (Table 2.3).

Table 2.3
Smoking Behaviour by Age and Gender

<table>
<thead>
<tr>
<th>Age</th>
<th>Male (%)</th>
<th>Female (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td>17</td>
<td>53</td>
<td>29</td>
</tr>
<tr>
<td>18</td>
<td>81</td>
<td>22</td>
</tr>
<tr>
<td>19</td>
<td>81</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>68</td>
<td>21</td>
</tr>
</tbody>
</table>


As seen in Table 2.3, male students tended to increase in the smoking rates with increasing age. The smoking rates between
ages 17 and 18 increased remarkably and over 80 percent of male students had ever smoked cigarettes. In the case of female students, the smoking rates increased between age of 16 and 17 and tended to decrease after that period.

Another Korean study investigated the differences in smoking rates of adolescents according to demographic factors related to their schooling, their workplace, or their situation in a juvenile prison. The findings revealed that the 39 percent of students, 52 percent of working adolescents and 83 percent of delinquent adolescents were regularly smoking everyday (Go & Han, 1995).

Research conducted with Korean adolescents pointed out that adolescents experimented with smoking for several reasons. Female students reported the leading reasons for smoking as curiosity, peer pressure and stress due to study. Male students reported peer pressure as the leading reason, followed by curiosity and stress due to study (The Conversation Plaza for Youth, 1993, cited in KIYD, 1995).

Although some substances, namely alcohol and tobacco, are commonly used drugs and are accepted legally for adults, it is broadly recognised that adolescent drug use and abuse is associated with negative health status of adolescents. This substance use or abuse of adolescents may be related to a variety of social and psychological factors. Adolescents' substance abuse is influenced by situational pressures such as
peer pressure from the same or opposite sex, changing social structures, curiosity, alienation and ignorance (The United Nations, 1992).

2.4.4. Mental Health Behaviours

During the last decades, a focus of adolescent health has been on their physical well being. There has been, however, growing interest in the broader welfare of this age group with increasing emphasis on mental health issues. Mental health problems presenting during the adolescent years may represent persistence of problems which arose in childhood or the onset of new illness. These mental health problems generally include stress, depression, anxiety, attention deficiency, learning disabilities and are sometimes associated with suicide (Hogarth, 1991; Jensen, 1991; Waters, 1991).

Raphael (1993) reported that anxiety, depression and adjustment problems were the major examples of mental health problems which frequently occurred during adolescence. Within adolescent health, mental health is an issue and the behavioural outcomes of this issue are reflected in the mortality and morbidity statistics.

In the U.S. studies revealed that adolescents were less concerned about physical health issues than they were about psychosocial issues (Sternlieb & Munan, 1972; Smith, Turner &
Jacobson, 1987; Froman & Owen, 1991). Garbarino (1990) supported these findings and suggest that a large number of environmental risks, as having a major psychological effect on adolescents.

In a U.S. community sample, Kashani et al. (1987) reported 41 percent of adolescents had at least one mental disorder and, 19 percent were judged to be functionally and emotionally impaired to a degree where the need for psychiatric treatment was indicated. The three most common mental disorders found in this sample were: anxiety disorders which affected nine percent of the sample; conduct disorders affecting nine percent; and, depression affecting eight percent. Similarly, Brandenburg, Friedman and Silver (1989) noted that the prevalence of psychiatric disorders in adolescents was approximately 14 percent to 20 percent.

More recently, U.S. statistics related to mental health problems of adolescents indicated that between 12 percent and 22 percent of adolescents under the age of 18 had at least one diagnosable mental disorder (U.S. DHHS, 1990). Such mental health problems are in common, caused by lack of social competence, uncertainty of future and life goal, low self-actualisation and bad peer relationships (Ellickson, Lara, Sherbourne & Zina, 1993).

A further U.S. study by Robert (1993) investigated adolescents' life satisfaction and reported that life satisfaction of
adolescents gradually increased from 82 percent of a sample in 1983, to 87 percent of a sample in 1987 to 87 percent of a sample in 1992. Results also indicated that there was a gender difference in life satisfaction. Eighty eight percent of male adolescents reported life satisfaction, while 85 percent of females indicated satisfaction with life.

In the United States, suicide has been placed as a leading cause of death for young people. According to a Centers for Disease Control survey (1991), 27 percent of high school students reported serious suicidal ideation, 16 percent had a specific suicidal plan, and eight percent had actually attempted suicide. Between 1979 and 1988, the national suicide rates increased by approximately eight percent. There were marked increases in both early adolescents aged ten to 14 and late adolescents 15 to 19 (75 percent and 34 percent, respectively) (U.S. DHHS, 1993).

The National Centres for Health Statistics [NCHS] (1989) indicated that between 1981 and 1987, suicide rates showed differences between male and female adolescents. Deaths of adolescent males aged 15 to 19 years attributed to suicide ranged from 13 percent in 1981 to 16 percent in 1987. Meanwhile, for females, the proportions were from three percent in 1981 to four percent in 1987. According to the NCHS (1991), among all deaths of adolescents aged 15 to 19 years in 1988 14 percent were caused by suicide. In 1991, the rates of
adolescent suicide occupied 13 percent of all deaths for young people aged 15 to 24 years.

Adolescent mental health is as important in Australia as it is in the U.S.. In Australia, in 1990, six percent of psychiatric in-patients were adolescents aged under 20 years. This was doubled compared to two years earlier where only three percent were in this category (NSW Department of Health, 1990).

Waters (1991) indicated that 15 percent of adolescents aged 13 to 17 years had their daily functioning impaired by mental health problems and for 19 year olds the figure was 20 percent. Similarly, Boyle and Offord (1991, cited in Kenny & Waters, 1995) concluded that 15 percent of adolescents aged 12 to 17 years and 20 percent of young adults had a psychiatric disorder. A further Australian study concerning adolescents' mental health, Nancarrow (1993) indicated that a large number of students were concerned with general mental health problems. The results pointed out that an estimated 53 percent of students were concerned about feeling depressed; 50 percent were concerned about emotional upsets; and, 48 percent had negative feeling about themselves or aspects of their life.

In contrast to Nancarrow, however, a more recent Australian national health survey conducted by Australian Bureau of Statistics (1995) reported that approximately 67 percent of
adolescents aged 12 to 16 years expressed agreement with the statement that they were happy with things in their life, 71 percent of those felt confident things would improve in their life and 68 percent believed their life to have purpose and meaning.

Suicide has been ranked as the second major cause of mortality for Australian adolescents (Hart, 1989; Raphael, 1989; Silburn & Zubrick, 1991). According to Australian Bureau of Statistics [ABS] (1994), the suicide rates of young people aged 15 to 24 years steadily increased from approximately 17 percent of all deaths in this age group in 1989, through 21 percent in 1990, 23 percent in 1991 to 24 percent in 1992. In addition, in 1993 the ABS reported sex differences in deaths of adolescents attributed to suicide. When the cohort of 15 to 19 year old males was considered 22 percent of all deaths were attributed to suicide and females occupied nine percent.

Adolescent mental health is an important issue in Korea and trends in mental health disorders have shown similar increases to those in the U.S. and Australia. According to the Ministry of Health and Welfare (1995), in Korea, the patient rates due to mental health disorders steadily increased each year since 1985. Males were twice as likely to suffer mental health disorders when compared to females. And, in the adolescent group, the number of patient rates for mental health disorders doubled between 1992 and 1993.
In addition, concerning students' life satisfaction and happiness, Michalos (1991) indicated that 30 percent of Korean students expressed agreement with the statement that they were happy in their life and 48 percent of those reported life satisfaction. Results also pointed out that male students had higher life satisfaction than females, in contrast, for happiness females rated higher scores than males.

Adolescent deaths caused by suicide have increased in Korea. Suicide has now become the second major cause of death of the 15 to 24 years age cohort. According to the National Statistical Office (1995), in 1994 nine percent of adolescent deaths for ten to 14 year olds died by suicide and for 15 to 19 year olds the deaths attributed to suicide occupied four percent of total mortality for this group.

The factors of suicide most frequently mentioned in the literature may be related to other risk behaviours such as substance abuse, sexual abuse and accident related behaviour. Studies indicated that substance abuse contributed to both physical and psychological impairment of adolescents and especially, adolescents depression which was correlated with substance abuse (Simons, Conger & Whitbeck, 1988; Reinherz, Frost & Parkis, 1991).

According to Hurrelman and Losel (1990), mental health not only depends on issues of appropriate socialisation and on
factors of positive environmental conditions but also on the individual's perception of what is real to them.

Factors that impinge upon and effect mental health of adolescents can be related to issues from the emotional, social, psychological and behavioural domains. Mental health problems of adolescents may result from peer group pressures, family situations, school problems, low self-esteem and the experience of chronic illness or disability (Hurrelman & Losel, 1990).

2.4.5. Nutritional Behaviours

Nutritional disorders are more prevalent during adolescence than at any other life stage. Obesity, simply defined as the excess of body fat, is the most prevalent diet-related health problem in the United States. According to Dietz (1995), obesity is associated with a number of health problems such as hypertension, diabetes mellitus, coronary heart disease, anxiety and depression.

In the U.S., Gortmaker, Dietz, Sobol and Wehler (1987) compared two national surveys conducted in 1960 and 1980 and concluded that the prevalence of obesity in children and adolescents significantly changed between 1960 and 1980. The prevalence of obesity increased from 28 percent in 1960 to 45 percent in 1980 for children aged six to 11 years and from 27
percent in 1960 to 41 percent in 1980 for adolescents aged 12 to 17.

In Australia, according to Carroll, Glesson, Ribsby and Dugdale (1986), 14 percent of adolescent females aged 11 to 19 years were overweight or obese but 36 percent of normal weight adolescents perceived themselves to be overweight. In male adolescents, 22 percent were overweight or obese but 17 percent of normal weight males perceived themselves to be overweight.

According to Australia Bureau of Statistics (1991), 18 percent of males and 36 percent of female adolescents aged 18 to 19 years were overweight and the prevalence of obesity in the adolescent group aged 18 to 19 years was approximately 13 percent for males and eight percent for females.

As opposed to obesity, anorexia nervosa includes intentional starvation, severe weight loss and distorted body image and bulimia is characterised by episodic binge eating, depressed mood following eating, purging through vomiting, laxative use and diuretic use. Weight fluctuations are common in bulimia but rarely reach the life threatening proportions that can occur in anorexia. Bulimics may be of normal weight while most anorexics are morbidly underweight (Sallis, 1993).

In the U.S., Halmi, Casper, Eckert, Goldberg and Davis (1979) indicated that the incidence of anorexia nervosa was estimated at one percent among adolescent females aged ten to 19 years
and that the age of onset was reported to be bimodal in distribution with peaks at 13-14 and 17-18 years of age. In addition, according to Atkins and Silber (1990), anorexia nervosa of early adolescents ranged from approximately 12 percent at ten years through nine percent for the age at 11 years to 32 percent for adolescents aged at 12 years.

Other U.S. studies report the incidence of bulimia range from approximately one to ten percent in female adolescents and 0.2 percent for male adolescents (Goldbloom & Garfinkel, 1989; Fairburn & Beglin, 1990; Haller, 1992). In addition, among adolescents with bulimia, approximately 30-80 percent of adolescents had a history of anorexia (Mitchell, Pyle & Eckert, 1985).

In Australian studies, Abraham, Mira, Beumont, Sowerbutts and Llewellyn-Jones (1983) reported that among adolescent and young females aged 15 to 27 years, seven percent suffered from anorexia nervosa and 13 percent were diagnosed with bulimia. In a more recent study, Ben-tovim, Subbiah, Schuetz and Morton (1989) reported that approximately two percent had an eating problem, four percent regularly used laxatives, 11 percent regularly vomited and 25 percent regularly starved themselves to lose weight.

In the United States, studies have documented adolescents' preferences for a thinner body coupled with their strong
avoidance of obesity. For this reason, many adolescents have attempted to control their weight.

Felt, Tavasso, Chenier and Dunn (1992) investigated adolescent eating habits and results revealed that 25 percent of high school female students perceived themselves to be fat and approximately 30 to 70 percent of females reported skipping meals for weight control.

According to Ponton, Gruber and DiClemente (1994), 33 percent of American adolescents reported that they binge at least twice a week, and 32 percent of Native American adolescents, 25 percent of Caucasian adolescents and 16 percent of African-American reported that they skip meals.

Button, Sonuga-Barke, Davies and Thompson (1996) indicated that approximately 57 percent of girls aged 15-16 years perceived themselves to be overweight, 46 percent responded to have ever skipped meals and estimated 17 percent of girls were currently skipping meals at the time of this study. The results, in addition, indicated that, for weight control, 38 percent of girls aged 15-16 years old responded to have exercised and 22 percent reported currently exercising.

Custatis and Shannon (1996) investigated nutritional behaviour of high school students in the 10th-12th grades. Results revealed that both male and female students surpassed recommendations for meat consumption; males surpassed
recommendations for daily consumption from the milk group, including chocolate, ice cream and cheese; and, females reported consumption of over 80 percent of the daily recommended number of milk servings. In contrast, there was much less adherence to the Food Guide Pyramid recommendation concerning the bread, vegetable and fruit groups. In terms of fat and sugar consumption, the results pointed out that male students reported significantly higher consumption from both categories than females.

In a more recent study concerning adolescents' attitudes towards food selection and the use of nutrition information, McCullum and Achterberg (1997) indicated that adolescents aged 15 to 18 years reported that they tended to consider personal preference, habits and price when selecting foods. Adolescents were five times more likely to use front labels or food items than nutrient labels as a means of decision making, and females were more likely than males to use front labels.

In Australia, Nancarrow (1993) investigated the lifestyle issues of high school students and revealed that approximately 49 percent of students reported having not enough exercise and 48 percent responded having foods in high-fat or refined sugar.

One national health survey by the Australian Bureau of Statistics (1995) investigated adolescent behaviours related to diet and nutrition. The results found out that 21 percent of adolescents aged 12 to 16 years consumed low amounts of
fruit, vegetables and green salad. The proportion of male adolescents with a low intake of these foods did not vary greatly with age, but for female adolescents, those with low consumption of these foods increased from 15 percent for 12 to 14 year olds to 31 percent among 15 to 16 year olds. In addition, this study reported that 45 percent of students daily ate potato chips and crisps, 29 percent consumed high-fat foods such meat pies, sausages and hamburgers and 73 percent ate foods high in refined sugar such as chocolate, ice cream and sweets. Male adolescents, however, consumed higher amounts of high-fat foods than females.

Adolescence is a time of increased risk for developing obesity and eating disorders and these health problems are related to nutritional behaviours that may seriously threaten adolescent health.

Some factors can be associated with adolescents' nutritional behaviours. According to Sallis (1993) nutritional behaviours of adolescents can be related to a variety of influences. Demographic factors, including age and ethnicity, have an effect. Social factors, including peer pressure, family influences and social attitudes, have an effect. Cultural and environmental factors including the influence of mass media, have an effect. And, personal and psychological factors have an effect. All the effects are eventually manifested in behaviour.
It is clearly recognised that many adolescents have been exposing to various types of risks in present times and sometimes engage in the risky behaviour. Thus, it is important to consider that negative health behaviour is likely to correlate with individuals' perceptions of health risks. It should be noted that the risk behaviour is the connotation often put on adolescents' behaviour by adults as adolescents themselves would not see many of their behaviours as risky. In relation to this perception of health risks, it is broadly recognised that people often have misperceptions about health risks.

2.5. Risk, Risk Perception and Perception Bias

Adolescence is generally thought of as a time when decisions are made concerning involvement in behaviours which may directly or indirectly affect immediate or long term health status. Examples of such behaviours include diet; substance abuse including drugs, alcohol and tobacco; and sexual activity. The decision to experiment and possibly engage in these behaviours may well be dependent on a variety of factors including how adolescents perceive these behaviours as risks to their morbidity and mortality.

In previous research, risk perception has been defined in a variety of ways such as perceived risk (Ellen, Boyer, Tschann & Shafer, 1996); susceptibility (Becker, 1974; Weinstein, 1987); perceived vulnerability (Perloff & Fetzer, 1986); perceived
susceptibility (Cumming, Becker & Maile, 1980); and, as a belief that one is susceptible to future negative outcomes and unprotected from danger or misfortune (Janoff-Bulman & Lang-Gunn, 1988).

According to Gough (1990), perceived risk is the individual or group evaluation of the risk likely to result from a certain activity. Risk preferences are used to infer perceived risk. In other words, perceived risk is the individual or group's judgment or valuation of the magnitude and likelihood of possible negative outcomes which may result from an action.

Weinstein (1980) indicated that perceived vulnerability has emphasised either a cognitive or an affective component of perceived risk and has also been treated as an emotional response to the possibility of victimisation, such as fear, worry or concern.

Weinstein (1983) defined perceived susceptibility as a belief that one is susceptible to future negative outcomes and unprotected from a dangerous situation. Accompanying this cognition is an affective component, consisting of feelings of anxiety and apprehension.

Given these concepts related to the risk construct, a ready explanation for why people take risks is that they ignore or at least greatly underestimate the likelihood of negative outcomes. A popular account of such perceptions is that
individuals see themselves as invulnerable to those risks, and in a sense are unrealistically optimistic about the outcomes of their behaviours (Perloff, 1987).

Many studies have attempted to identify the perceived invulnerability hypothesis related to unrealistic optimism. A study by McCoy et al. (1992) comparing current smokers with former smokers and nonsmokers with respect to perceptions of smoking risk concluded that current smokers judged their health risk attributed to smoking as significantly lower than former/nonsmokers and also did not consider non-smoking to be beneficial to their health. These results showed optimistic bias of current smokers and were consistent with results from the previous studies (Hansen & Malotte, 1986; Leventhal, Glynn & Fleming, 1987).

In studies based on adolescent samples, Cvetkovich, Grote, Bjorseth and Sarkissian (1975) and Morrison (1985) concluded that approximately 33-50 percent of sexually active adolescents explained not using contraceptives with variants of "I thought I (or my partners) could not get pregnant" (p. 553). This may have resulted from exaggeration of invulnerable perceptions and from specific misunderstandings about reproductive processes (e.g., "it can't happen the first time; if it didn't happen the first time, it won't ever happen; I can't get pregnant during my period") (Cvetkovich et al., 1975; Cvetkovich & Grote, 1983).
Hoorens and Buunk (1993) indicated that high school students generally judged themselves as less vulnerable than other from risks such as heart attack, suicide, AIDS and alcohol. These findings were consistent with Weinstein's (1982) earlier study which investigated students' perception in self and other risk ratings. This study concluded that college students reported their own chances to be higher than zero for the positive health events and lower than zero for the negative events.

Moore and Rosenthal (1992) investigated risk perceptions of adolescents aged from 17 to 20 years in five health-related areas (AIDS, sexually transmitted diseases, serious car accidents, lung cancer and skin cancer) and the relationship between risk perception and actual risk behaviour. The results indicated that adolescents underestimated their likelihood for each of the negative health events as lower than that of other people of the same age and gender. However, adolescents did not exhibit unthinking invulnerability but made discriminating judgments on a basis in reality about the relative likelihood of various events happening to them.

Perception bias about avoiding life's problems may be related to age and gender. Finn and Bragg (1986) and Jonah (1986) reported that young drivers perceived less risk in speeding and night driving than did older drivers, which suggests that accident rates among youth may reflect a failure to be cognisant of or appreciate dangerous situations.
Hansen and Malotte (1986) asked adolescent smokers and nonsmokers their chances of experiencing health risks related to smoking if they smoked a certain number of cigarettes each day, compared with those of others who smoked the same amount of cigarettes. The findings revealed that all adolescents reported the chances of high risk for themselves as lower than those of others and, that young smokers aged ten to 14 years had higher optimistic bias than older adolescent smokers in the age of 15 to 18 years.

Smith and Rosenthal (1995) supported gender differences and, pointed out that girls rated their chances of engaging in some activities like drink-driving, having sexual intercourse without using a condom and taking amphetamines as significantly lower than those of boys.

In contrast, Weinstein's findings (1987) based on a large general population explored that unrealistic optimism was prevalent among the population as a whole, and furthermore the amount of optimistic biases, elicited by 69 different hazards, was largely unrelated to age, sex, level of education or occupation. Moore and Rosenthal (1992), in addition, supported no gender differences in risk perceptions about several behaviours, except for driving. The findings revealed that male adolescents engaged in more actual risky behaviour because males underestimated their risks in relation to their actual
behaviour, perhaps as a consequence of overestimating their skills.

Even though comparable data with adults are lacking, a recent study by Cohn, Macfarlane, Yanez and Imai (1995) indicated that adolescents did not perceive themselves to be less likely than their parents to encounter a risky situation. Compared with their parents, however, adolescents tended to minimise the perceived risk of experimental and occasional involvement in health-threatening activities.

These results are supported by a study of Quadrel, Fischhoff and Davis (1993). Eighty six adolescents and their parents reported their likelihood of encountering four health risks such as excessive drinking alcohol, mugging, car accident and unplanned pregnancy. The findings indicated that adolescents did not perceive themselves as more vulnerable to risks than did their parents. Indeed, parents in this study estimated their chances of risk as lower than their adolescent children.

It is important to consider that most research on perceived risk perceptions compared a person's own health risks with the health risks of a typical other person, the 'average other' (Weinstein, 1980; Perloff & Brickman, 1982; Drake, 1984; Kulik & Mahler, 1987; Perloff, 1987; Quardel et al., 1993). However, it has been shown that people do not tend to perceive themselves as being less vulnerable to risks, compared with close friends or their relatives instead of the
average other. One explanation for this difference may be that one's close friends are simultaneously known better and liked more by a person than the average other, so that both motivational and cognitive processes may prevent the distortion of one's own subjective vulnerability as compared to one's best friend's risks (Perloff & Brickman, 1982; Perloff & Fetzer, 1986).

On the basis of this explanation, Perloff and Fetzer (1986) investigated peoples' judgements about their own vulnerability and the vulnerability of others. The results revealed that college students perceived themselves as less vulnerable than typical comparison groups (i.e., the average person or the average college student) to ten negative events, whereas the college students perceived their close friends or siblings as being as vulnerable as themselves.

In contrast, a study by Hoorens and Buunk (1993) was only partly consistent with the findings of Perloff and Fetzer. In this study, students compared their chances of health risk with those of three other comparison groups: the average students, randomly chosen students and their best same sex friends. Hoorens and Buunk concluded that students did not estimate themselves as less vulnerable to health risks than typical people. Students also judged their chances to health risks as the same as those of their best friends.
According to Millstein and Irwin (1985), although individuals had a similar perception concerning some negative health risks such as alcohol, smoking, drug use and unsafe sexual intercourse, when individuals compared their likelihood on health risks with that of other people, the differences of risk perceptions occur. People were likely to underestimate the potentially negative outcomes of their behaviours and perceive themselves as being invulnerable. Adolescents, especially, tended to anticipate that the risks associated with certain behaviours will diminish as age increases (Millstein & Irwin, 1985).

Such beliefs about personal risk often turn out to be unrealistic optimism. Whalen et al. (1994) indicated that the term, unrealistic optimism has been variously labelled "optimistic bias, perception bias, positive illusion or unique invulnerability because of the logical impossibility that everyone's risks are lower than those of everyone else" (p. 319).

Weinstein (1980) suggested that individuals underestimated the degree to which they were at risk of unpleasant events. Additionally, Weinstein hypothesised that unrealistically low perception of risks were associated with,

(a) more undesirable events, (b) events perceived to have a low probability in the general population, (c) events with which the judge had little personal experience (i.e., did not know a victim), (d) events which were seen to be outside the control of an individual's actions (e.g., earthquake) and (e) events for which there was a clearly defined stereotype of a
victim (e.g., AIDS suffers stereotyped as homosexuals) (p. 178).

This argument was consistent with Kahneman and Tversky's research (1974, cited in Moore and Rosenthal, 1992). They noted that such a stereotyping allowed individuals to distance themselves from the possibility of becoming victims, and that such distancing served an important ego-protective function. It is a counterproductive protective technique, however, and alleviates the likelihood of changing one's own behaviour to a healthy one.

In 1982, Weinstein explained optimistic bias on the basis of psychological aspects of cognition and motivation. The cognitive explanation involves cognitive errors referring to egocentrism and stereotyped mental images of the victim. Due to egocentrism, people may forget that their efforts to reduce the likelihood of a negative event may be shared by many others. People may also have a stereotypic mental image of the victim. If they do not perceive themselves as fitting this image, they do not find themselves at risk. Meanwhile, with regard to motivation, the model predicts a positive relationship between motivation and optimism. Again, a type of ego-defensive process such as self-esteem enhancement, influences optimism which is a general tendency of people to believe to better and healthier than average.

Weinstein and Kleim (1995) indicated that this unrealistic optimism exists because people fail to give as much attention
to their own risk-increasing attributes as they give to their risk-decreasing attributes. Commenting on the causes of optimistic bias, Taylor et al. (1992) suggested that optimistic bias is due to unmotivated cognitive errors and to the motivation to avoid anxiety related to risk. Such motivations may lead people to exaggerate the health-threatening behaviours of their peers, and result in low self-esteem and self-efficacy and high external locus of control on health because of different causal attributions for the negative health events and maladaptive psychological consequences.

Priest (1993) explained a theoretical model of risk taking in Figure 2.11 which describes the elements of risk taking linked by the psychological fields, performance, attribution, locus of control, emotions, competence, motivation, arousal and self-efficacy. This model also indicated that risk taking behaviour was explained in relation to "eustressful and distressful spirals which help participants to correct in perception of risk and competence in a risk situation" (p. 50). An explanation by Keyes (1985, cited in Yates, 1994) concerning differences in risk taking suggested that some differences can be caused by differences in risk perception.
Figure 2.11 Theoretical Model of Competence for Human Risk Taking Behaviour.
Cox (1964, cited in Attarian, 1992) categorised risk perceptions as having two dimensions: the uncertainty of the result and uncertainty pertaining to the consequences of a decision. In this respect the individual will perceive the likelihood of a particular result and also the positive and negative consequences of action.

In general, it is hypothesised that risk perception is associated with either a cognitive or an affective component. In previous studies, the perception of vulnerability has been operationalized as an estimate of the probability or likelihood of victimisation (Weinstein, 1980; Becker & Lund, 1982).

Likewise, Donovan, Jessor and Costa (1991) suggested that individuals engaging in risk behaviours tend to have a unique set of attitudes, values and perceptions and report unconventionality in their value for risk behaviours. Such unconventionality includes "high engagement in risk behaviours such as drug use and delinquency and reflected non-involvement in conventional behaviours such as school activities and academic performance" (p. 59).

In a recent American study investigating perceptions of adolescents about the general risk domains, Henker, Whalen and O'Neil (1995) found that health, safety and school-related concerns like grades and relationship to peers were reported as the key health-threatening events and approximately 25 percent of adolescents were also concerned about
environmental degradation and social relationships. Henker and colleagues, in addition, indicated that male adolescents were more concerned about everyday events, while female adolescents were inclined to focus on global and social issues. These results may mirror gender disparity in psychosocial maturity.

Adolescence is a crucial period in the formation of perception on health risk but unfortunately many adolescents are likely to have perception biases. Risk perceptions of adolescents are frequently attributed to several factors such as social, psychological and cultural factors. Similar to the other age groups adolescents are likely to judge their own likelihood of health risks as lower than that of other people in their age, due to, mainly, negative psychological consequences such as low self-esteem and self-efficacy and high external locus of control.

Although very little is known about the relationships between adolescents’ health behaviours and health risk perceptions and psychological factors, research has attempted to identify the relationship between them.

2.6. Selected Psychological Variables Related to Adolescent Health Status

Previous sections of this thesis have asserted the role played by behaviour in determining health status. Health behaviour
itself is a complex multifactorial reality. Health behaviour is the overt expression of a complicated interaction of physical, social and psychological factors. It is a sub set of the latter, the psychological factors, which is a focus of this thesis in examining aspects of health behaviour.

2.6.1. Health Locus of Control

Health Locus of Control [HLC], as a psychological construct, originated from Rotter's (1954) social learning theory to explain, predict and influence people's perception and behaviour regarding their health. The main tenet of social learning theory is that the likelihood of a behaviour occurring in a given situation is a function of (a) the individual's expectancy that the behaviour will lead to a particular reinforcement and (b) the extent to which the reinforcement is valued (Morris & Summers, 1995).

In this theory, reinforcement has been recognised as a determinant of behaviour. The perception of the individual about the sources of this reinforcement is an important element in determining future behaviour. In other words, the perception of the individual about reinforcement as a generalised expectancy relating to the perceived relationship between one's actions and experienced outcomes creates dichotomous variables termed internal and external locus of control (Rotter, 1966).
Explanations regarding internal locus of control suggest that the individuals perceive themselves as responsible for their behaviour, whereas external locus of control indicates that individuals perceive that other individuals or other forces are responsible for their behaviour (Strickland, 1978). It can be explained that internals (those who believe that they are responsible for their own behaviour) perceive a causal relationship between their actions and reinforcement. Meanwhile, externals (those who believe other people or other factors are responsible for their own behaviour) cannot recognise this relationship and try to attribute these consequences to luck, fate or other sources that are external to themselves (Kennelly & Mount, 1985).

In 1981, Levenson developed a multidimensional perspective of locus of control on the basis of Rotter's unidimensional model. In the multidimensional perspective, external locus of control is divided into two dimensions; powerful others and chance (an aspect of risk). Control by powerful others refers to the belief that individual health is determined by the actions of doctors and other health professionals through their instructions, medications and recommendations. Chance control refers to the belief that health and risks to health are largely a matter of luck or fate and are not able to be controlled (Levenson, 1981).
As such, whilst one's behaviour or perception, sometimes, may be determined by powerful others and chance locus of control, there is an assumption that internals are more likely to take control of their health, seek health information, and be knowledgeable about their risks (Bundek, Marks & Richardson, 1993).

Research has attempted to test this assumption and generally has tended to accept it. Wildman, Rosenbaum, Framer, Keane and Johnson (1979) investigated a relationship between self-control procedures and reduction of adolescents' smoking. The results indicated that a group with internal locus of control treatments smoked significantly less cigarettes than did a group with external locus of control treatments and these group differences remained almost the same throughout a follow-up period. In addition, The study implied that smoking cessation significantly correlated with high internal health locus of control and low chance health locus of control but scores on powerful others locus of control did not affect the intention to stop smoking.

Concerning a difference of health locus of control between adolescent smokers and nonsmokers, Eiser, Eiser, Gammage and Morgan (1989) indicated that smokers tended to score highly on chance health locus of control and reported low powerful others and internal locus of control, compared with nonsmokers. They also indicated that smokers had low beliefs regarding benefits of preventive health behaviours such as
exercise and good nutrition. The study implied that locus of control was associated with smoking behaviour of adolescents and locus of control beliefs should be emphasised with other health beliefs and behaviours in health education throughout childhood.

In a study testing the links between health locus of control and risk-taking behaviours of adolescents, Whatley (1991) revealed that two of three locus of control subscales were associated with engaging in risk behaviours of adolescents. Adolescents with internal locus of control beliefs perceived themselves to be healthy, and believed that illness depends on their own behaviour. Adolescents with powerful others locus of control believed their own health was largely affected by other people, while chance locus of control was not related to risk taking of adolescents in this study. The study concluded that the importance of health locus of control on risk-taking in adolescents should be introduced early in health education throughout childhood and adolescence to decrease negative health behaviours and reduce the risk-taking involvement.

A study related to a function of health beliefs to cope with a health problem by Havermans and Eiser (1991) identified a relationship between health locus of control and management of children with diabetic symptoms. The results found out that children with diabetic symptoms had lower beliefs on powerful others but higher beliefs on internal locus of control and with no differences on chance locus of control, compared with the
healthy children. These results were interpreted as the beliefs of diabetic children on powerful others are reduced because they are suffering from diabetes in spite of the continued contact with medical professionals. Moreover, importantly for this thesis, this study noted an age difference in locus of control. Children with increasing age showed a higher internal locus of control belief and a lower powerful others belief. This finding was consistent with a study by Steward and Steward (1981) suggesting that healthy older children were less dependent on doctor or other people regarding their own health than young children.

Ricco-Howe (1991) investigated factors related to adolescents' use of car safety belts and reported the significant relationship between seat belt use of adolescents and locus of control. The findings revealed that powerful others control ("safety belt use by a parent and friend") was the strongest predictor of adolescent safety belt use. Male adolescents showed a higher score on the influence of friends, compared with that of parents, meanwhile females tended to be affected more by parents than by friends. This result was consistent with a study by Maron, Telch and Killen (1986) suggesting that adolescents' seat belt use was greatly associated with seat belt use by family and friends. This study indicated that the educational programmes and legislative opportunities were essential for increasing adolescent safety belt use.
Bundek, Marks and Richardson (1993) investigated the association between multidimensional health locus of control and medical screening practice, including attentiveness to health-related information, and indicated high correlation between internal locus of control and the preventive behaviours of cancer. The study concluded that a belief that health outcomes are controlled by internal control was positively related to preventive behaviour over which has a high degree of personal control, such as screening and attention to health-related information.

Nada-Raja, McGee and Williams (1994) examined the sex differences in health beliefs of adolescents regarding general health and mental health. In general health, male students had stronger and simultaneous beliefs in internal, chance and powerful others locus of control than females. Females differed significantly from males in that they believed good health was associated with external locus of control. Although there were statistically significant sex differences in locus of control of adolescents about general health, these differences were not enough to be considered meaningful.

In addition, a study by Weizel, Hudak, Becker, Waller and Stuibergen (1994) investigated health locus of control and health promoting behaviours of white, Hispanic and black male adolescents. The findings noted that white males rated lower on both powerful others and chance health locus of control than did Hispanics and blacks. In contrast, black males showed
higher scores on both external locus of control scales than whites and Hispanics. These findings, thus, concluded that whites may attribute their health outcomes more to internal factors than do Hispanics and blacks. The study suggested that intervention strategies for improving a psychosocial aspect of health behaviour such as stress management, interpersonal support and self-actualisation should be emphasised for various cultural groups.

Cole and Slocumb (1995) attempted to explore factors correlated with the sexual behaviour of male university students. The findings revealed that students with an internal locus of control reported higher scores on a safe sex behavioural scale. This result supported the study of Tashakkori and Thompson (1992) which indicated that AIDS preventive behaviours were related to high internal locus of control beliefs.

Furthermore, Morgan, Chapar and Fisher (1995) investigated the impact of locus of control on adolescent's pregnancy and concluded that adolescents who had ever experienced pregnancy reported significantly higher scores on the powerful others locus of control subscale than did those who had never been pregnant. Based on the results, this study argued that adolescents who were dependent on others for health decision-making tended to be more susceptible to peer pressure or even more dependent on authority figures.
Regarding a relationship between locus of control and risk perception Perloff (1987) suggested if people believe that their skills and abilities to control health risks are better than those of others, then they will also believe that they will more effectively reduce health risks than other people. As health risks are perceived as controllable, this belief must lead to unrealistic optimism. An alternative explanation may be that people who believe that they are in control of their own health show more health protective behaviours than people who believe things are controlled by chance or powerful others (Strickland, 1978; M. Seeman & T.E. Seeman, 1983).

Hoorens and Buunk (1993) examined a relationship between locus of control and unrealistic optimism. The results showed that students with generalised internal control reported more optimism over specific health risk events than students with external locus of control. This study was consistent with Guarnera and Williams's study (1987) with adult samples.

It is evident that health locus of control is an important psychological predictor related to health and illness behaviour of individuals. Especially, internal health locus of control is an essential factor for changing harmful health behaviour and maintaining good healthy lifestyle and may be susceptible to age and cultural variation.
2.6.2. Self-Efficacy

Self-efficacy was introduced by Bandura (1977) in the context of cognitive modification. Self-efficacy relates to "individuals' perceptions and refers to beliefs that people can successfully perform the behaviour necessary to produce a desired outcome". (Bandura, 1986, p 391).

It is generally reported that one's self-efficacy pertaining to preventive behaviours produces the self-confidence necessary for the successful performance of preventive behaviours. A person who has low self-efficacy in a given situation is likely to avoid difficult tasks, shows low aspirations and makes minimal commitments to goals. A person with strong self-efficacy, in a particular situation, perceives tasks as challenges rather than threats, tries to overcome the tasks and maintain commitments to goals (Bandura, 1982).

The concept of self-efficacy has been applied to such diverse areas as school achievement, emotional disorders and mental and physical health. Importantly, a large body of research has identified the importance of self-efficacy as a predictor of behaviour change in the health domain (Bandura, 1992; O'Leary, 1992; Schwarzer, 1992; Maddux, 1993). Perceived self-efficacy represents the belief that one can change risky health behaviours by personal action (e.g., skill acquisition to avoid negative health behaviours) and this belief affects the
intention to change risk behaviour and the amount of effort expended to attain this goal.

In a study testing a relationship between self-efficacy and AIDS preventive behaviours, Kasen, Vaughan and Walter (1992) surveyed engagement in sexual contact, condom use and belief about self-efficacy for AIDS preventive behaviours from tenth grade students in an AIDS prevention centre. The findings indicated that students with low self-efficacy for refusing sexual contact tended to report having sexual intercourse as twice as much as other students and were five times less likely to have used condoms consistently. This study implied that building up self-efficacy for AIDS prevention behaviour should be the first step in effecting successful behaviour change.

Havermans and Eiser (1991) investigated a relationship between self-efficacy and control of diabetes with subjects at 12 years drawn from a population of healthy children and those with diabetes. The result indicated that diabetic children tended to show less self-efficacy in their abilities to overcome diabetes than healthy children.

In addition, Walter et al. (1992) argued that the AIDS risk behaviours were significantly correlated with self-efficacy. This study suggested that psychosocial factors may strongly influence involvement in AIDS risk behaviour of adolescents and thus that further explanation of the psychosocial influence
process regarding adolescent health should become a prevention research priority.

A study by Stuart, Borland and McMurray (1994) tested an impact of psychological factors on health risk behaviour and examined self-efficacy and health locus of control as predictors of smoking cessation. The results noted that self-efficacy and health locus of control were associated with the process of smoking cessation with self-efficacy tending to increase throughout the treatment sessions among those who attempted to quit smoking, but not among non-attempters. This study suggested that smoking cessation treatment should focus on increasing motivation, influencing expectations in succeeding to quit and maintaining confidence in their ability to refrain from smoking.

In a recent study, Abraham, Rubaale and Kipp (1995) investigated psychological factors influencing HIV-preventive knowledge of students. The findings noted that preventive actions were strongly associated with self-efficacy. More than half of subjects reported condom use as an effective method for reducing HIV risk. This result was consistent with Schwarzer's (1992) study suggesting the consequences of preventive actions were shown to be substantially correlated with self-efficacy and supported a study by O'Leary, Goodhart, Jemmott and Boccher-Lattimore (1992) indicating self-efficacy as a strong predictor of condom use.
Self-efficacy generally refers to the conviction that the individual can successfully perform specific behaviour necessary to produce a desired outcome. It is implicated as having a direct influence on a variety of health behaviours and thus receives support as a possible determinant of health promotive behaviour.

2.6.3. Self-Esteem

Self-esteem is widely recognised as a central aspect of psychological functioning and it is related to many other variables, including general satisfaction with one's life. According to Kalliopuska (1990), self-esteem is part of the individual's identity which is not static, but rather, it is always susceptible to internal and external influences. He also suggests that self-esteem is an internal sense of self-regard, which includes confidence in one's own abilities and judgements, and that it serves as a measure of the self-praise and the favourable which a person attributes to himself. Estimates of self-esteem generally rise when the person has self-reliance, confident awareness of his/her own powers and resources, and self-determination defined as inner control and self-regulation (Reynold & Cormack, 1990).

For example, people who have high self-esteem tend to emphasise their abilities, strengths and good qualities, whereas individuals with low self-esteem show their deficiencies,
weakness and negative qualities. Schlenker, Soraci and McCarthy (1976) also suggested that individuals with high self-esteem were used to experiencing personal success and prefer positive feedback about themselves from others. Individuals with low self-esteem were accustomed to experiencing failure and were willing to accept negative feedback.

Rosenberg (1985) argued that self-esteem was associated with many psychological variables as well as behavioural ones. He suggested, for example, compared to adolescents with high self-esteem, those with low self-esteem were more depressed, less satisfied with life and scored highly on anxiety, aggression and irritability.

Herold, Goodwin and Lero (1979) investigated the relationship between self-esteem and contraception used by female adolescents aged 13-20. The results indicated that female adolescents with high self-esteem reported to have positive attitudes toward using birth control pills, use of effective contraception, consistent use of birth control, lack of embarrassment about seeking professional advice and lack of embarrassment over the internal examination. In contrast, adolescents with low self-esteem were significantly more likely to feel guilty about having sexual intercourse, had less favourable attitudes toward using the birth control pills and were significantly less likely to be using effective contraception or to practise consistent use of contraception. The study
directly suggested a relationship between self-esteem and positive health behaviour.

One study by Button (1990) supported the general hypothesis concerning the relationship between self-esteem and eating disorders in females. Girls with low self-esteem were more likely to develop eating concerns and disorders compared to those with more positive self-reliance. In the first study, Button indicated that low self-esteem was associated with a range of psychological problems in female adolescents aged 11-12, including greater concern with regard to body image and obesity. The findings also concluded that more severe and persisting weight concern and eating problems would be likely to develop in females with low self-esteem.

More recently, one longitudinal study by Shope, Copeland, Maharg, Dielman and Butchart (1993), used tenth grade students participating in an alcohol misuse prevention programme to investigate the relationship between their health beliefs and their skills to refuse alcohol. The results indicated a relationship between alcohol refusal skills, locus of control and self-esteem. Students who were better at demonstrating alcohol refusal behaviours showed greater internal locus of control and self-esteem than other people. This result supported the study, the area of alcohol use, by Bruhn and Parcel (1982) which indicated that adolescents with high self-esteem tended to engage in fewer negative health
behaviours and reported less intention to use alcohol in the future.

Furthermore, a study testing cognitive development, egocentrism and self-esteem in relation to contraceptive knowledge, attitudes and behaviour by Holmbeck, Crossman, Wandrei and Gasiewski (1994) concluded that adolescents who had higher levels of cognitive development and self-esteem and lower levels of egocentrism tended to have more contraceptive knowledge, were more likely to report the use of contraception during sexual intercourse, and had more positive attitudes toward contraception. Adolescents with high self-esteem did not perceive issues about sexuality and contraception as trivial, were more likely to try to find information about contraception and had more positive view of such preventive measures. In broad terms they were more concerned about maintaining control over events in their lives.

Rivas, Torres, Fernandez and Maceira (1995) supported Rosenberg's findings (1985) and generally explained the relationship between self-esteem and adolescents' health. They revealed that self-esteem of young adolescents was significantly and positively correlated with personal and mental health. Self-esteem, in older adolescents, was significantly and positively correlated with mental health and aspects of safe behaviour. These findings supported by previous research which concluded that positive self-esteem contributed to improve personal and mental health, especially
during the critical period of adolescence (Neel, Jay & Litt, 1985; Costa, Jessor & Donovan, 1989).

In a study about the relationship between adolescent self-esteem and smoking, Abernathy, Massad and Romano-Dwyer (1995) concluded that self-esteem may be implicated as a key factor in the smoking behaviour of female adolescents in grades six to eight but not for males in any grade. In addition, this study argued that the level of self-esteem was associated with smoking in females but not males. Further, the study supported the findings of other research which suggested that females may have different motivations to initiate and maintain the smoking habit (Abernathy & Bertrand, 1992).

Rivas and Fernandez (1995) indicated that self-esteem was an important factor to maintain the mental health of adolescents. Specifically, higher self-esteem was closely related to avoidance of sadness, control of one's feelings and maintenance of self-confidence. This study implied that self-esteem was significantly and positively correlated with mental health and personal health and underlined the importance of taking personality factors into account in the design of health education programmes.

Recently, Button, Sonuga-Barke, Davies and Thompson (1996) investigated the role of self-esteem in the development of eating problems in female adolescents aged 15-16 who were subjects in the study conducted by Buton (1990). The results
revealed that females with low self-esteem were about eight times more at risk of developing eating problems than those with high self-esteem. Interestingly, females who were concerned about fatness at age 11-12 became heavier, more dissatisfied with their weight and more inclined to be engaged in dieting behaviour. In addition, females with low self-esteem at 11-12 tended to have lower self-esteem at age 15-16 and more likely to display a great number of problems regarding health.

Bolognini, Plancherel, Bettschart and Halfon (1996) investigated the relationship between self-esteem and mental health, and gender differences. This study found that self-esteem was a determining variable in the mental health of early adolescence and that adolescents with low self-esteem tended to report significantly high scores on depressive states. Bolognini et al. also revealed that males demonstrated a higher correlation between self-esteem and mental health than did females. Females, however, reported more problems with depression and anxiety than males. Previous studies related to gender differences and self-esteem supported the findings of this study that females generally had lower self-esteem than did males (Rosenberg & Simmons, 1975, Kawash, 1982; Brack, Orr & Ingersoll, 1988; Block & Robins, 1993).

There is a notable relationship between self-esteem and general health behaviour, specially during the critical period of adolescence. Positive self-esteem has a crucial place in
encouraging favourable health behaviour and modifying adolescents' negative behavioural habits.

2.7. Summary

The literature surveyed in this section provides a clear theoretical basis for the study. The literature outlines the nature of adolescence; reviews the nature of health and identifies health behaviour and risk perception as the major determinants of health status; considers the major causes of morbidity and mortality of adolescents and provides a behavioural overlay. The comment was made concerning the complex multifactorial nature of health behaviour and risk perception and a focus on psychological variables was developed.

Literature was reviewed from the United States, Australia and Korea. Importantly, there were similarities but also cultural differences. Clearly, the literature review demonstrated a dearth of literature available in Korea. Not only was this true for the demographic aspects regarding the prevalence and incidence of health behaviour but, especially true with regard to literature concerning the psychological aspects of health behaviour. In a sense this is not surprising given that health promotion and education is in its infancy in Korea. This gives rise to one of the implicit purposes of this study and that is to
contribute to the body of knowledge in this field from a Korean perspective.
CHAPTER III

METHOD

The purpose of this research was to investigate the health risk perceptions, health profiles and psychological variables of adolescents from the same ethnic background across gender and the two different cultural settings. This study, in addition, explored the possible relationships of psychological variables with health risk perceptions and health profiles of adolescents and identified a possible relationship between health risk perception, health profile and psychological factor. This chapter describes the research design, subjects, instruments, data collecting procedures and statistical methods of analysis designed to investigate these health issues relating to adolescents.

3.1. Research Design of the Study

Previous research into the health of adolescents have utilised a variety of methods to gather data. For this research, information of a general nature was collected from a specific population using survey methodology. According to Wilson (1993), survey research design allows the gathering of
information about a large number of people by collecting data from a sample drawn from that population. Survey research generally allows the researcher to describe characteristics, opinions, attitudes or behaviours as they can be currently found in that population. In this study, the survey approach allowed for measurement and verification of selected variables and involved the use of rating scales and identification of dependent and independent variables. In order to obtain the required information, a non-experimental study was chosen to allow the exploration and description of information about the health of adolescents and to establish a basis for future studies.

3.2. Subjects

Subjects for this study consisted of 416 Korean students who attended public high schools in Korea and Australia. The subjects were selected from three public high schools in Seoul and six Korean schools in Sydney.

Subjects in Sydney represented the population of students who attended New South Wales (Australia) public high schools for their formal education and Korean school on weekends to learn Korean language, history and culture. Most of the Sydney subjects were born in Australia or have lived in Australia for more than 5 years.
Subjects in Korea were selected from a convenience sample of three high schools which were geographically located in mid-range socioeconomic areas of Seoul. All students in the age cohort 14-18 years who attended these schools were considered as potential subjects. The final sample was randomly selected from the available student pool. The sample of Seoul students was randomly stratified to match the Sydney sample.

3.3. Instruments

Instruments were used to measure perception and perception bias of adolescents with regard to general health risks and their health profiles. Further instruments were used to measure selected psychological variables and explore their possible causal linkages with health risk perception and health profile. The list of instruments used in this study were:

1. Self and Other Risk Judgment Profile;
2. Health Promoting Lifestyle Profile;
3. Multidimensional Health Locus of Control Scale;
4. Self-Efficacy Scale; and
5. Self-Esteem Scale

For the subjects in Seoul these instruments were translated into Korean and sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to
obtain comment regarding content and construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instruments. They were then asked to check and make suggestions to improve the instruments for cultural validity and minor adjustments were made. Similarly, the revised instruments were provided to four experts (Appendix A) in Australia familiar with health education and adolescent areas. From their recommendations several items were altered. Through this process, content validity suitable to the purposes of the study and different cultural settings of the revised instruments was established.

3.3.1. Self and Other Risk Judgment Profile

For assessing the Self and Other Risk perceptions of adolescents, the instrument used in this study was a modified version of Self and Other Risk Judgments Profile (Whalen et al., 1994) which consisted of 19 negative health risk events that individuals might experience in their future lives. Sixteen health risk events from the original scale were used and a further eight items added. All items were selected on the basis of lifestyle events and health-risk reference that adolescents might experience in the future (Breslow, 1996; Sells & Blum, 1996). A total of 24 health risk events, listed in random order, were finally used in this study as a tool for assessing Self and Other Risk perceptions and optimistic bias.
This questionnaire was divided into three subsections or domains: General Health (AIDS, heart attack, cancer, diabetes, broken bones, influenza, serious car injury and tooth decay); Lifestyle Factors (smoking, use of illegal drugs, alcohol consumption, exercise levels, diet, obesity, stress, suicide, drink driving) and Environment (becoming a homicide victim, getting caught in a fire, being exposed to toxic waste, suffering illness from chemicals in food, being exposed to acid rain, suffering the effects of air pollution and getting caught in an earthquake). For each event in each section subjects were asked to indicate the likelihood of themselves or others being exposed to or suffering from the described events.

3.3.1.1. Scoring

Although a variety of other scales were used in previous studies where this type of instrument was used (Weinstein, 1980; Perloff and Fetzer, 1986), this study used a 5-point scale that ranged from -2 (very unlikely) to 2 (very likely), and emphasised the comparative aspect of the risk judgments. Subjects were asked to rate each event on the five point scale from -2 to +2. Values less than zero indicated an optimistic tendency to claim that one's risk was less than average; values greater than zero indicating a tendency to claim that one's risk was higher than the average. A score of zero indicated that one's risk was perceived average (Cohn, Macfarlane, Yanez & Imai, 1995). For each health risk event a mean score was able
to be calculated. Similarly, for each domain (General Health, Lifestyle Factors and Environment) each event in the domain was summed and a mean score for the domain was attained.

3.3.1.2. Reliability

To determine the coefficient of internal consistency of the Self and Other Risk Judgment Profile, data were collected from 60 secondary school students in Sydney. The responses were scored and a coefficient was determined through the split-half correlation. Data obtained were split into two subtests by placing all odd-numbered events in one subtest and all even-numbered events in another subtest. The scores of the two subtests were computed for each individual and were correlated. The correlation obtained, however, represented the reliability coefficient of only half the test and hence a correction was applied in order to obtain the reliability of the entire test. The Spearman-Brown prophecy formula was used to make the correction (Thorndike & Hagen 1969). Through these procedures, a coefficient of .75 was achieved.

3.3.1.3. Validity

The instrument translated into Korean sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to obtain comment regarding content and
construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instrument. They were then asked to check and make suggestions to improve the instrument for cultural validity and minor adjustments were made. Similarly, the revised instrument were provided to four experts (Appendix A) in Australia familiar with health education and adolescent areas. From their recommendations several items were altered. Through this process, content validity suitable to the purposes of the study and different cultural settings of the revised instrument was established.

3.3.2. Health Promoting Lifestyle Profile

To assess the health profile of subjects used in this study, a modified version of the Health Promoting Lifestyle Profile [HPLP] was used. Items for the initial form of the Health Promoting Lifestyle Profile [HPLP] were obtained from the Lifestyle and Health Habit Assessment (LHHA). The LHHA, incorporated ideas from a variety of literature by Pender (1982) and is a 100-item checklist of positive health behaviours. Based on the LHHA, the pilot form of the HPLP was given to a sample of 173 graduate and senior undergraduate nursing students to evaluate item clarity. Students' comments revealed a lack of clarity in the wording of a few items and then the resulting instrument produced 107 items (Walker, Sechrist & Pender, 1987).
Following the pilot study, data from the 952 general adult population were selected to obtain the final form of the HPLP. As mentioned earlier, the HPLP contained 107 items, of which 81 were worded as desirable or positive behaviours or perceptions and 26 were worded as undesirable or negative behaviours or perceptions. Item analysis was conducted on the pool of 107 items to identify those which contributed most to the internal consistency of the measure, followed by factor analysis to investigate the factorial composition of the refined item pool (Walker et al., 1987).

Through this process, the Health Promoting Lifestyle Profile [HPLP] developed by Walker, Sechrist and Pender (1987) consisted of 48 items. A total of 41 health profile items, listed in random order, were finally used in this study. Seven items from the original scale were deleted on the basis of the Validation Committees' suggestions. The HPLP is directed toward assessing an individual's level of well-being, self-actualisation and personal fulfilment. The majority of lifestyle assessment measures are health hazard/health risk appraisal tools that focus primarily on health-protecting (preventive) behaviours based on risk reduction concepts. This instrument, however, focuses on health promoting behaviours, in a psychological perspective, viewed as a multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualisation and fulfilment of the individuals.
An overall indication of the health promoting component of lifestyle is obtained through measuring components of behaviourally and psychologically oriented six subscales: Self-Actualisation, Health Responsibility, Exercise, Nutrition, Interpersonal Support and Stress Management.

3.3.2.1. Scoring

A numerical value was assigned to the response for each statement which asked the respondent to indicate their level of behaviour for each health related item. All responses were scored on a scale from one to four: 1=never, 2=sometimes, 3=often and 4=routinely. For each subscale responses were summed and mean scores calculated. In each subscale and for each item the higher the score the more positive an individuals' health promoting profile in that individual indicator or subscale.

3.3.2.2. Reliability

Following the study to obtain the final form of the HPLP, the total scale had high internal consistency reliability ($r=.92$) and subscale alpha coefficients were reported to range from .70 to .90. Stability as measured by a two-week interval test-retest of 63 adolescents produced a Pearson $r$ of .93 for the total
subscale and subscale coefficients ranging from .81 to .91 (Walker et al., 1987).

3.3.2.3. Validity

The instrument was translated into Korean and sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to obtain comment regarding content and construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instrument. They were then asked to check and make suggestions to improve the instrument for cultural validity and minor adjustments were made. Similarly, the revised instrument was provided to four experts (Appendix A) in Australia familiar with health education and adolescent areas. From their recommendations several items were altered. Through this process, content validity suitable to the purposes of the study and different cultural settings of the revised instrument was established.

3.3.3. Multidimensional Health Locus of Control Scale

To assess beliefs about selected psychological variables related to adolescents' health, the Multidimensional Health Locus of Control [MHLC] Scale (K.A, Wallston, R.S. Wallston & DeVellis, 1978) was used in this study. This standardised questionnaire,
based on the Rotter's definitions of external-internal control of outcome expectations, consisted of 18 questions which provided measures of three sub-scales (internality, powerful others and chances). The Internal Health Locus of Control scale assesses an individuals' abilities to control his/her health (Questions 1, 6, 8, 12, 13 and 17). The Powerful Other Health Locus of Control construct tests the beliefs that powerful others, such as doctors, nurses, friends and family, determine one's health (Questions 3, 5, 7, 10, 14 and 18). The Chance Health Locus of Control Construct assesses the beliefs that health/illness is determined by fate, luck or chance (Questions 2, 4, 9, 11, 15 and 16).

The administration of the MHLC scale does not require any special training. Familiarity with general test procedures and with the test items, in order to read them to the students is enough for administering it. In this regard, although the subjects in year ten or above could answer the items by themselves, the investigator read the questions aloud to the students.

3.3.3.1. Scoring

The Likert technique of summated ratings was used and numerical value was assigned for each of the six possible answers. For statements in which a favourable response was desired a "strongly agree" was allocated a numerical value of
six and a "strongly disagree" a numerical value of one. Each subscale had a range of six to 36 with median score of 21. For each subscale, individuals had "high internal locus of control, powerful other locus of control or chance locus of control" if they scored above the median (Wallston et al., 1978).

3.3.3.2. Reliability

The three subscales of this questionnaire were statistically independent. The authors of the instrument reported the alpha reliabilities for the three six-item scales as .77 for the internal control items; .67 for the powerful others items; and, .75 for the chance control items (Wallston et al., 1978).

3.3.3.3. Validity

To investigate validity for the MHLC Scale, correlations were computed between health status and the MHLC scores. As a result, health status correlated positively with Internal Health Locus of Control [IHLC] ($r=.40$), negatively with Chance Health Locus of Control [CHLC] ($r=-.28$) and did not correlate with Powerful-other Locus of Control [PHLC] ($r=-.55$) (Wallston et al., 1978). Thus, correlations in the predicted direction of the MHLC scales with health status provided some evidence of predictive validity.
The instrument was translated into Korean and sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to obtain comment regarding content and construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instrument. They were then asked to check and make suggestions to improve the instrument for cultural validity and minor adjustments were made.

3.3.4. Self-Efficacy Scale

The Self-efficacy Scale, developed by Sherer et al. (1982), was used to measure general self-efficacy expectations based on past success or failure. Subjects indicated their degree of agreement with items related to perceptions of personal ability to affect outcomes in varied situations.

3.3.4.1. Scoring

The technique of summed rating was followed and a numerical value was assigned to the response for each statement. A score of 14 indicated "strongly agree" and a score of one indicated "strongly disagree" toward the statement. Among 17 items 13 items were reversed and required the scores to be converted. The larger the score, the greater the self-efficacy expectation. Individuals scoring above mean
scores were considered high in self-efficacy and those scoring below the mean were considered low in self-efficacy (Sherer et al., 1982). The total score of each respondent was considered an indication of value of self-efficacy.

3.3.4.2. Reliability

A Cronbach alpha coefficient of .86 was reported for the instrument. The internal consistency of the instrument was accepted (Sherer et al., 1982).

3.3.4.3. Validity

As the initial step for assessing the construct validity of the Self-efficacy Scale, Sherer et al. (1982) validated the instrument with the assistance of 376 general psychology students who completed a 36-item self-efficacy scale. Through factor analysis, the instrument was scaled down to 23 items and then 17 items composed the general self-efficacy subscale. Scores on this instrument were then compared with six other personality characteristics that included locus of control, personal control, social desirability, ego strength, interpersonal competency and self-esteem. The correlations were in the anticipated direction (positive or negative) and not of sufficient magnitude to indicate that self-efficacy was measuring the
same variable as the other personality characteristics. Thus the validity for the questionnaire was claimed (Sherer et al., 1982).

The instrument was translated into Korean and sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to obtain comment regarding content and construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instrument. They were then asked to check and make suggestions to improve the instrument for cultural validity and minor adjustments were made.

3.3.5. Self-Esteem Scale

To assess the self-esteem of adolescents this study used the Rosenberg Self-esteem Scale (Rosenberg, 1965), a ten item Guttman Scale with a coefficient of reproductivity of 92 percent.

3.3.5.1. Scoring

The Rosenberg Self-esteem Scale was scored according to the Likert technique of summated ratings and a numerical value was assigned for each of the four possible answers. A score of four on an item indicated "strongly agree" and a score of one indicated "strongly disagree" toward the statement. Five
reversed items among ten items required the scores to be converted. The total score of each respondent was considered an indication of value of self-esteem.

3.3.5.2. Reliability

In order to obtain a coefficient of internal consistency, Silber and Tippett (1965) performed a two-week test-retest using a small number of college students and obtained a reliability of $r = .85$. Claire and McCullough (cited in Rosenberg, 1965) found a two-week test-retest reliability of $r = .88$ from their small number of college samples as well.

3.3.5.3. Validity

To test validity of the self-esteem scale, the convergent and discriminant validity has been examined by Silber and Tippett (1965) and Tippett and Silber (1965). This study of 44 college students measured two traits (global self-esteem and stability of self-concept) by means of four different methods: the Rosengberg Self-esteem, a self-ideal discrepancy test, the health self-image questionnaire and a psychiatrist's rating. The correlations of the Self-esteem scale to the self-ideal discrepancy score was $r = .67$; to the health self-image questionnaire, $r = .83$; and to the psychiatrist's rating, $r = .56$. 
Other evidence of convergent validity came from Crandall's (1973) finding that the correlation of the Rosenberg Self-esteem and the Coopersmith Self-esteem Inventory (Coopersmith, 1967) was .60. There was, thus, evidence of both convergent and discriminant validity for the self-esteem scale. The instrument was translated into Korean and sent out to four experts (Appendix A) in Korea familiar with the health education and adolescent areas to obtain comment regarding content and construct validity. The reviewers were briefed regarding the purposes of the study and the established background of the instrument. They were then asked to check and make suggestions to improve the instrument for cultural validity and minor adjustments were made.

3.3.6. Summary

In summary, the variables of this study were identified and assessed by selected measures. Instruments with established validity and reliability were used or modified to measure adolescents' health risk perception and health profile and the psychological variables contributing to perception and behaviours of adolescents.
Table 3.1
A Summary of Variables and Instruments of This Study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Instruments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Perception and</td>
<td>Self and Other Risk Judgement Profile</td>
</tr>
<tr>
<td>Perception Bias</td>
<td></td>
</tr>
<tr>
<td>Health Profile</td>
<td>Health Promoting Lifestyle Profile</td>
</tr>
<tr>
<td>Health Locus of Control</td>
<td>Multidimensional Health Locus of Control Scale</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>Self-efficacy Scale</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>Self-esteem Scale</td>
</tr>
</tbody>
</table>

Using these instruments data were collected in the manner described below.

3.4. Procedures

3.4.1. Permissions

In order to gather data from the selected schools, permission from several sources had to be obtained. The relevant organisations and persons were as follows:
3.4.1.1. Human Experimentation Committee in the University of Wollongong

According to the regulations of the University of Wollongong, each experiment or item of research, in which human beings are involved as subjects of the study, must be approved by the Human Experimental Ethics Committee. This committee granted its permission. A copy of the permission is enclosed in Appendix B.

3.4.1.2. Principals of the Schools

After attaining permission from the Human Experimentation Ethics Committee, the principal of each selected school was required to agree to the research being carried out in his or her school. Hence, the investigator approached the principal and explained the aims of the research and procedures of data collection. In addition, a summary of the research proposal with a cover letter from the investigator was submitted. This letter is enclosed in Appendix B.

3.4.1.3. Students and Parents

Again, before the fieldwork, the investigator was required to obtain permission of the students and their parents for their son/daughter to take part in this study. Hence, a letter with a
permission slip was provided for this purpose. This letter, along with a cover letter by the principal of the school, was sent to each parent before testing sessions. Only students who returned the permission slips signed by themselves and their parents, took part in the testing sessions. This letter with the permission slips also is enclosed in Appendix B.

3.4.2. Pilot Study

Before administering the instruments to the sample, it was necessary to administer the tests to a pilot group to ensure the instruments were suitable for the students in the survey and to check that factors such as 'time to complete' were appropriate for the study.

The sample size of the pilot study was 75 students (40 high school students in Seoul and 35 students in Sydney). The students completed the survey with no difficulties in interpretation of the items. It was possible to confirm and establish the required completion time. This information was needed for the researcher and the participating school principals in the planning stage.
3.4.3. Data Collection

To obtain the data, times were arranged for subjects to complete the battery of instruments. The aims and procedures of testing were explained and each instrument was introduced by the researcher at this time.

Students were advised that confidentiality would be maintained and voluntary participation was emphasised. Students had previously been given permission notes to take home to parents and only those students with positive responses were invited to take part. After the questionnaire was distributed, time was allowed for the students to ask questions for clarification about any part of the procedure. After the students had completed the questionnaires they were collected and a control sheet was attached to the front of the top paper to enable coding to be completed.

3.4.4. Data Entry

Items were coded to enable computerised data entry. Data were then entered and edited on a computer input data file before being subsequently transferred for storage on Statistical Package for the Social Sciences [SPSS] 6.0 and Analysis of Moment Structure [AMOS] 3.6 for Windows. This work was undertaken by the researcher. At the same time, gender and
psychological variables (in hypothesis 4) were defined as dependent variables. In addition, for hypothesis 5 the five psychological variables: Internal Health locus of Control; Powerful Other Health Locus of Control; Chance Health Locus of Control; Self-efficacy; and, Self-esteem were defined as independent variables and the sub domains in health risk perception: Health; Lifestyle; and, Environment and the sub dimensions in health profile: Self-actualisation; Health responsibility; exercise; Nutrition; Interpersonal support; and, Stress management were treated as dependent variables.

Table 3.2
A Summary of Independent and Dependent Variables of This Study

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Independent Variables</th>
<th>Dependent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1</td>
<td></td>
<td>Health risk perception</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Risk perception bias</td>
</tr>
<tr>
<td>Hypothesis 2</td>
<td>Gender</td>
<td>Health risk perception</td>
</tr>
<tr>
<td></td>
<td>Cultural setting</td>
<td>Risk perception bias</td>
</tr>
<tr>
<td>Hypothesis 3</td>
<td>Gender</td>
<td>Health profile</td>
</tr>
<tr>
<td></td>
<td>Cultural setting</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 4</td>
<td>Gender</td>
<td>Psychological variables</td>
</tr>
<tr>
<td></td>
<td>Cultural setting</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 5</td>
<td>Five psychological</td>
<td>Sub domains of health risk perception</td>
</tr>
<tr>
<td></td>
<td>variables</td>
<td>Sub dimensions of health profile</td>
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<td></td>
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</tbody>
</table>
In research regarding investigating possible relationships, researchers are often interested in studying theoretical constructs which cannot be observed directly. Such constructs are referred to as latent variables or factors. Assessment of latent variables is obtained indirectly through measurement of some variables representing them. These measured variables are termed observed variables or indicator variables. The latent variables in this study were determined by the scores of selected indicator variables obtained from the questionnaires.

In this study, to investigate possible relationship between latent variables (hypothesis 6), health risk perception, health profile and a psychological factor were determined as latent variables and variables representing latent variables (Internal Health Locus of Control, Lifestyle and Health Responsibility etc.) were defined as indicator variables.
3.5.2. Adolescents' Perception and Perception Bias on Health Risks

The Self and Other Risk Judgment Profile was utilised to measure these variables and the following steps were taken:
1. A descriptive mean score and standard deviation for the Self Risk perception were calculated for each event.

2. A paired t-test compared the means between Self and Other risk perceptions for each event.

3. To examine the differences of perception biases across gender and the different cultural settings, mean scores and standard deviations for the Self and Other Risk ratings were compared using a univariate ANOVA and Multivariate Analysis of Variance [MANOVA].

3.5.3. Health Promoting Lifestyle Profile

The questionnaire concerning adolescents' lifestyle profile was administrated and the following computations were performed:

1. Descriptive statistics were calculated for each statement.

2. To test the differences in health profile between gender and between the different cultural settings, mean scores and standard deviations for six subscales of the questionnaire were calculated using t-test and differences were compared.
3.5.4. Psychological Variables

The three questionnaires concerning adolescents' beliefs, ability to control health, self-reliability and life satisfaction were administrated and the following computations were performed:

1. Descriptive statistics were calculated for each statement in the three questionnaires.
2. To test the differences in psychological variables between gender and between the different cultural settings, mean scores and standard deviations for each questionnaire were calculated using t-test and differences were compared.

3.5.5. The Relationship of Psychological Variables with Health Risk Perception and Health Profile

Constructs such as risk perception and health profile and the psychological variables used in this study are complex. By complex, it is implied that the construct may have many facets and causes and many sources of variation. Therefore in order to study such constructs, scientific research must be able to identify the sources of variation. Such a study tries to explain the variability of a target construct, called the dependent variable, and relations with other variables, called independent variables (Pedhazur, 1982).
To build a model of relationships among variables derived from non-experimental and correlational studies of the health related domain, the researcher needed a statistical method to postulate causality. By establishing a causal link or the hypothetical model, the study can predict relationships between variables and validate hypothesis rather than describing a mere empirical association (Chen and Land, 1986).

The statistical technique regression analysis is well known as an effective method to determine how, and to what extent, variation in the dependent variable depends on manipulation of the independent variable. Generally speaking, by means of regression analysis a study can analyse the variability of a dependent variable by resorting to information that is available from one or more independent variables. In other words, studies seek to find changes in the dependent variable as a result of changes observed in the independent variables (Long, 1983).

In regression analysis when more than one independent variable is used in the study, it should be noted that the independent variables may be intercorrelated, or they may interact in their effects on the dependent variable. In this case, the application of multiple regression analysis is recommended. By multiple regression analysis, not only can the separate effect of each independent variable on a dependent variable be determined and the total effects of the independent variables
on the dependent variable can also be determined (Keppel & Shedon, 1989).

Outputs of regression analyses provide the required information. The coefficient of determination represents the proportion of the total variation in a dependent variable that is explained by the independent variable of the study (Jobson, 1991). The squared multiple correlation indicated by the coefficient of multiple correlation, is equivalent to Pearson correlation. When interpreting the results of a multiple regression analysis, the investigator usually is interested in comparing the standardised regression weights of each variable. The size of the regression coefficient depends on the scales of measurement used for the dependent variable and the independent variables which are involved in the model (Draper & Smith, 1981).

There are two kinds of regression coefficients: the unstandardised coefficient and the standardised coefficient. Therefore, when the research intends to compare the size of the effect of each independent variable on the dependent variable, it is necessary to standardise the independent variable. Again, in order to make meaningful comparisons, the research should compare the size of the standardised regression coefficients (Jobson, 1991).

One model which accounts for antecedent causes including latent variables is the Analysis of Moment Structure (AMOS).
Before using the AMOS program in the study it was important to note that the complexity of influence of variables could be assessed best if multiple variables were studied simultaneously in one structural model (Pender, Walker, Sechrist & Frank-Stromborg, 1990). The examination of the structural equation model using AMOS provided a mechanism to address the problems inherent in using hierarchical multiple regression in that the set of equation is simultaneously, rather than serially, tested and measurement error is accounted for (Arbuckle, 1997).

In order to test a possible relationship of each psychological variable with the sub domains in health risk perception and health profile, the hypothetical model was constructed in the initial step of regression analysis by an AMOS program.

Figure 3.2 displays an input paradigm for a conventional linear regression analysis model between psychological variables and the sub domains/dimensions in health risk perception and health profile.
Figure 3.2  An Input Paradigm of Regression Analysis Model between Psychological Variables and the Sub Domains in Health Risk Perception and Health Profile.
In Figure 3.2 the model scored on three Loci of Control, Self-efficacy and Self-esteem were supposed to predict Health Risk Perception and Health Profile. More specifically, it supposed that each domain in Health Risk Perception and each dimension in Health Profile can be approximated by a linear combination of each psychological variable. Again, the single-headed arrows(←) represented linear dependencies. For example, the arrow leading from Self-efficacy to Health Responsibility indicated that Health Responsibility scores depend, in part, on Self-efficacy.

The prediction might not be perfect, however, and thus the model included an Error term. The Error term represented not only random fluctuations in Health Risk Perception and Health Profile scores due to measurement error but also a composite of age, socioeconomic status, culture and anything else on which Health Risk Perception and Health Profile may depend, but which were not measured in this study. These variables were essential because the model attempted to explore the effect of psychological variables on Health Risk Perception and Health Profile scores. Without the error terms, the model would make the implausible claim that Health Risk Perception and Health Profile were an exact linear combination of all psychological variables.
3.5.6. A Relationship Between Health Risk Perception, Health Profile and Psychological Factor

In the social and behavioural sciences research is often interested in studying theoretical constructs that cannot be observed directly: such phenomena are termed latent variables or factors. Examples of latent variables in psychology are self-efficacy, self-esteem and health locus of control (Byrne, 1989).

Since latent variables are not directly observed, they cannot be directly measured. Thus, the researcher must operationally define the latent variable of interest in terms of behaviour believed to represent it. Assessment of the construct, then, is obtained indirectly through measurement of some observed behaviour. The term behaviour is used in this study in its broadest sense to include scores on a particular instrument. These measured scores are termed observed or indicator variables; they are considered to represent the underlying construct of interest (Byrne, 1989).

The most well-known statistical procedure for investigating relations between a set of indicator variables and its underlying constructs is that of factor analysis. There are two basic types of factor analysis: exploratory factor analysis and confirmatory factor analysis. In exploratory factor analysis the researcher does not know the underlying latent variable structure. Thus, the focus of the investigation is directed toward uncovering the minimal number of factors that underlie
the indicator variables. In confirmatory factor analysis, on the other hand, the research has some knowledge of the underlying latent variable structure. This knowledge may be based on theory, empirical research, or some combination of both (Bentler, 1980).

To identify possible relationship among the latent variables related to this research question: Health Risk Perception; Health Profile; and Psychological Factor, the hypothetical model, as the regression analysis model, was proposed in the initial step of a confirmatory factor analysis by an AMOS program.

Figure 3.3 displayed an input paradigm for a confirmatory factor analysis model between Health Risk Perception, Health Profile and Psychological Factor.
Figure 3.3 An Input Paradigm of Factor Analysis Model between Health Risk Perception, Health Profile and Psychological Factor.
As shown in Figure 3.3, three ellipses were labelled Health Risk Perception, Psychological Factor and Health Profile. These theoretical constructs were called latent variables and cannot be directly measured because these are not directly observed. This model, therefore, operationally defined the latent variables as the particular measures believed to represent them. These measures were called indicator variables. The Psychological Factor (latent variable) was measured by five indicator variables: Internal Health Locus of Control, Powerful Other Health Locus of Control, Chance Health Locus of Control, Self-efficacy and Self-esteem; Health Risk Perception was measured by assessing three broad risk domains: General Health, Lifestyle Factors and Environment. Also, Health Profile was assessed by the six subscales of Health Promoting Lifestyle Profile such as Self-actualisation, Health Responsibility, Exercise, Nutrition, Interpersonal Support and Stress Management.

As noted in the hypothesis 6 this model posited that there were the reciprocal causal relationships between Health Risk Perception, Health Profile and the Psychological Factor. Again, the double-headed arrows(↔) in the model connected variables that may be correlated with each other.

As well as the model for regression analysis, the path(←) from each error to each indicator variable was fixed at the default "one" in the model.
3.6. Summary

The following table provides a summary of the major hypotheses of the study; the variables relevant to each hypothesis; and, the statistical analytical techniques.

Table 3.3
A Summary of the Hypotheses, Variables and Analytical Techniques of This Study

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Variable(s)</th>
<th>Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescents will perceive their chances of health risks as less than the average and as lower than those of their peers.</td>
<td>•Risk perceptions •Risk perception bias</td>
<td>•Descriptive means and standard deviations •Paired t-test</td>
</tr>
<tr>
<td>There will be a difference in health risk perception of adolescents across gender and the different cultural settings.</td>
<td>•Risk perception bias •Gender •The different cultural settings</td>
<td>•Univariate and Multivariate analysis of variance</td>
</tr>
<tr>
<td>There will be a difference in health profile across gender and the different cultural settings.</td>
<td>•Health profile •Gender •The different cultural settings</td>
<td>•Independent t-test</td>
</tr>
<tr>
<td>There will be a difference in psychological variables across gender and the different cultural settings.</td>
<td>•Psychological variables •Gender •The different cultural settings</td>
<td>•Independent t-test</td>
</tr>
</tbody>
</table>
Table 3.3 (Continued)

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Variable(s)</th>
<th>Analyses</th>
</tr>
</thead>
</table>
| There will be a relationship of psychological variables with health risk perceptions and health profiles of adolescents | • Health risk perception  
• Health profile  
• Five psychological variables | • Regression analysis |
| There will be a possible relationship between health risk perception, health profile and psychological factor | • Health risk perception  
• Health profile  
• Psychological factor | • Confirmatory factor analysis |
A study was undertaken involving adolescents of the same ethnic background to investigate their perception; perception bias toward health risks; health profile; and, psychological variables according to gender and cultural differences. Concomitantly, this study was undertaken to identify a possible relationship of the five psychological variables with the domains in health risk perception and the dimensions in health profile of adolescents and a possible relationship between health risk perception, health profile and a psychological factor composed of identified psychological variables.

Data from the instruments were analysed by appropriate statistical methods and the results were reported for each of the research questions which guided the development of the study.

4.1. Sample

Originally 485 students were randomly chosen from selected high schools in Seoul, Korea and Sydney, Australia to participate in this study but following the gathering of data
only responses from students who fully completed the test batteries were used. Table 4.1 shows the numbers of students according to age, gender and cultural setting.

Table 4.1
Sample Demographics

<table>
<thead>
<tr>
<th>Age</th>
<th>Seoul(N) Male</th>
<th>Seoul(N) Female</th>
<th>Sydney(N) Male</th>
<th>Sydney(N) Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>13</td>
<td>16</td>
<td>10</td>
<td>14</td>
<td>53</td>
</tr>
<tr>
<td>15</td>
<td>35</td>
<td>26</td>
<td>31</td>
<td>22</td>
<td>114</td>
</tr>
<tr>
<td>16</td>
<td>9</td>
<td>7</td>
<td>13</td>
<td>20</td>
<td>49</td>
</tr>
<tr>
<td>17</td>
<td>20</td>
<td>26</td>
<td>28</td>
<td>18</td>
<td>92</td>
</tr>
<tr>
<td>18</td>
<td>23</td>
<td>33</td>
<td>18</td>
<td>34</td>
<td>108</td>
</tr>
</tbody>
</table>

A total of 416 students formed the sample for the study. An analysis of the table reveals similar gender and age distribution for each cultural setting. The exception is the 16 year age group where the Seoul sub sample had a lower number of respondents than the Sydney sub sample. This artifact of the sample was not seen as an impediment to the study but the effect on generalisation of the results is recognised.

4.2. Research Question One

Research question one investigated how adolescents, regardless of gender and the different cultural settings, perceived their
health risk (ie. whether they perceived themselves as being at risk for specified health events).

Data were obtained by asking subjects to answer the questionnaire concerning perceived risk. For each item a score between -2 and +2 was possible. A score of less than zero to -2 indicated perception bias, or a tendency to underestimate vulnerability to health risk and assess it as lower than the average. A score of zero was taken to indicate that risk was perceived as being average while a score greater than zero to +2 indicated a tendency to perceive vulnerability as higher than the average.

A descriptive analysis of means and standard deviations was conducted for each health risk event to determine the level of Self Risk perception and these are reported out in Table 4.2.

The results indicated that all adolescents, irrespective of gender and cultural setting, tended to have an unrealistic perception about their vulnerability to the majority of the health risk events. In the Self Risk rating reported in Table 4.2, of the 24 selected health risk events 20 were rated with means below zero and four items were rated with means above zero. Adolescents perceived themselves as not being vulnerable to 'drugs', 'AIDS', 'drink-driving', 'homicide', 'toxic waste', 'earthquake' and 'suicide' (means were -1.61, -1.57, -1.48, -1.21, -1.10 and -1.10, respectively). Meanwhile adolescents perceived themselves as being vulnerable to 'influenza' with a
mean rating of .95, 'too much stress' with a mean of .39, 'tooth decay' with a mean of .25 and 'air pollution' with a mean of .05. Given the mean rating for the majority of possible health risk event was less than zero, the common belief that adolescent judgements are characterised by perceptions of low vulnerability or optimistic bias was appeared to be supported.

Research question one, further investigated whether adolescents perceived their likelihood of health risks as lower than that of others of the same age. In other words whether or not they exhibited optimistic bias.

In order to identify adolescents' perceived risk for each health risk event, a mean score and standard deviation were calculated for the Self Risk scale as was a mean score and standard deviation for the Other Risk scale. A difference between Self Risk and Other Risk scores for each health event score was tested using a paired t-test and results are again reported in Table 4.2.

Table 4.2
Comparative Analysis of Self and Other Risk Ratings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self Risk Rating</th>
<th>Other Risk Rating</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Domain</td>
<td>M: -.50</td>
<td>SD: .82</td>
<td>M: .24</td>
</tr>
<tr>
<td></td>
<td>SD: .57</td>
<td></td>
<td>SD: 1.22</td>
</tr>
<tr>
<td>Broken bone</td>
<td>M: -.45</td>
<td>SD: 1.26</td>
<td>M: .49</td>
</tr>
<tr>
<td></td>
<td>SD: 1.22</td>
<td></td>
<td>SD: 1.22</td>
</tr>
<tr>
<td>AIDS</td>
<td>M: -1.57</td>
<td>SD: .84</td>
<td>M: -.10</td>
</tr>
<tr>
<td></td>
<td>SD: 1.32</td>
<td></td>
<td>SD: 1.32</td>
</tr>
<tr>
<td>Cancer</td>
<td>M: -.79</td>
<td>SD: 1.39</td>
<td>M: -.23</td>
</tr>
<tr>
<td></td>
<td>SD: 1.30</td>
<td></td>
<td>SD: 1.30</td>
</tr>
<tr>
<td>Diabetes</td>
<td>M: -.97</td>
<td>SD: 1.24</td>
<td>M: -.11</td>
</tr>
<tr>
<td></td>
<td>SD: 1.30</td>
<td></td>
<td>SD: 1.30</td>
</tr>
<tr>
<td>Serious car injury</td>
<td>M: -.52</td>
<td>SD: 1.20</td>
<td>M: .26</td>
</tr>
<tr>
<td></td>
<td>SD: 1.38</td>
<td></td>
<td>SD: 1.38</td>
</tr>
</tbody>
</table>

Table 4.2 (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self Risk Rating</th>
<th>Other Risk Rating</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>Heart attack</td>
<td>-.93</td>
<td>1.36</td>
<td>-.36</td>
</tr>
<tr>
<td>Tooth decay</td>
<td>.25</td>
<td>1.42</td>
<td>.75</td>
</tr>
<tr>
<td>Influenza</td>
<td>.95</td>
<td>1.18</td>
<td>1.23</td>
</tr>
<tr>
<td>Lifestyle Domain</td>
<td>-.79</td>
<td>.79</td>
<td>-.38</td>
</tr>
<tr>
<td>Smo ke cigarettes</td>
<td>-.84</td>
<td>1.42</td>
<td>.68</td>
</tr>
<tr>
<td>Take illicit drugs</td>
<td>-1.61</td>
<td>.78</td>
<td>-.06</td>
</tr>
<tr>
<td>Too much alcohol</td>
<td>-.96</td>
<td>1.26</td>
<td>.49</td>
</tr>
<tr>
<td>Unhealthy foods</td>
<td>-.43</td>
<td>1.09</td>
<td>.71</td>
</tr>
<tr>
<td>Drink-driving</td>
<td>-1.48</td>
<td>.89</td>
<td>-.18</td>
</tr>
<tr>
<td>Too little exercise</td>
<td>-.26</td>
<td>1.35</td>
<td>.19</td>
</tr>
<tr>
<td>Obesity</td>
<td>-.83</td>
<td>1.36</td>
<td>.07</td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>-1.09</td>
<td>1.20</td>
<td>-.19</td>
</tr>
<tr>
<td>Too much stress</td>
<td>.39</td>
<td>1.28</td>
<td>1.01</td>
</tr>
<tr>
<td>Environment Domain</td>
<td>-.79</td>
<td>.93</td>
<td>-.26</td>
</tr>
<tr>
<td>Toxic waste</td>
<td>-1.10</td>
<td>1.05</td>
<td>-.38</td>
</tr>
<tr>
<td>Chemicals in food</td>
<td>-.95</td>
<td>1.20</td>
<td>-.29</td>
</tr>
<tr>
<td>Homicide victim</td>
<td>-1.21</td>
<td>1.07</td>
<td>-.46</td>
</tr>
<tr>
<td>Acid rain</td>
<td>-.38</td>
<td>1.46</td>
<td>.09</td>
</tr>
<tr>
<td>Fire</td>
<td>-.82</td>
<td>1.16</td>
<td>-.21</td>
</tr>
<tr>
<td>Earthquake</td>
<td>-1.10</td>
<td>1.14</td>
<td>-.85</td>
</tr>
<tr>
<td>Air pollution</td>
<td>.05</td>
<td>1.34</td>
<td>.31</td>
</tr>
</tbody>
</table>

*p<.0001

Table 4.2 showed that adolescents were clearly optimistic about their own chances of successfully encountering a wide array of health risks compared to their perception regarding the chances of other adolescents. Paired t-tests revealed highly significant optimistic bias between Self and Other Risk ratings for all health risk events (p<.0001). In addition, among the
three risk domains adolescents reported the highest optimistic bias in the Lifestyle domain. When the events in this domain were reviewed the majority of them showed extremely high optimistic bias (e.g., 'drugs' $t=-24.88$, 'AIDS' $t=-20.16$, 'driving' $t=-19.46$, 'alcohol' $t=-17.85$ and 'air pollution' $t=-17.53$, all $p<.0001$). Clearly the results indicated that, in general terms adolescents perceived their health risks were low or alternatively as optimistically biased with regard to perceived risk, particularly with regard to lifestyle behaviours.

4.3. Research Question Two

In order to explore the differences in health risk perceptions of adolescents between gender and between the different cultural settings, the mean scores obtained from Self and Other Risk Judgments were analysed using a Multivariate Analysis of Variance [MANOVA] design. Separate MANOVAs were conducted for each of the three risk domains (General Health, Lifestyle Factors and Environment). The independent variables in these MANOVAs were gender and cultural setting and the dependent variables were the three risk domains in the Self and Other Risk Judgments. Univariate ANOVAs were also conducted to analyse the differences between gender for both Self Risk and Other Risk data on each health risk event. Table 4.3 shows the results of univariate and multivariate F-test for each health risk domain by gender.
Table 4.3
Results of the Univariate and Multivariate F-test for Each Health Risk by Gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self Risk</th>
<th>Rating</th>
<th>Other Risk</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Domain+</td>
<td>M^a</td>
<td>F^b</td>
<td>F-value</td>
<td>M^a</td>
</tr>
<tr>
<td>Broken bone</td>
<td>-.45 - .55</td>
<td>1.58</td>
<td>.08 .39</td>
<td>32.62**</td>
</tr>
<tr>
<td>AIDS</td>
<td>-1.50 - 1.63</td>
<td>2.91</td>
<td>-.46 .23</td>
<td>33.26***</td>
</tr>
<tr>
<td>Cancer</td>
<td>-.49 - 1.07</td>
<td>19.27***</td>
<td>-.38 .07</td>
<td>5.91*</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-1.00 - .94</td>
<td>.18</td>
<td>-.34 .11</td>
<td>12.57***</td>
</tr>
<tr>
<td>Serious car injury</td>
<td>-.65 - .41</td>
<td>4.22*</td>
<td>.27 .25</td>
<td>.01</td>
</tr>
<tr>
<td>Heart attack</td>
<td>-.50 -.34</td>
<td>50.00***</td>
<td>-.71 .03</td>
<td>30.15***</td>
</tr>
<tr>
<td>Tooth decay</td>
<td>.19 .30</td>
<td>.60</td>
<td>.69 .81</td>
<td>1.20</td>
</tr>
<tr>
<td>Influenza</td>
<td>.72 .16</td>
<td>16.00***</td>
<td>1.17 1.27</td>
<td>.91</td>
</tr>
<tr>
<td>Lifestyle Domain+</td>
<td>-.68 - .89</td>
<td>7.47**</td>
<td>.25 .36</td>
<td>43.97***</td>
</tr>
<tr>
<td>Smoke cigarettes</td>
<td>-.45 - 1.20</td>
<td>32.60***</td>
<td>.99 .41</td>
<td>23.70***</td>
</tr>
<tr>
<td>Take illicit drugs</td>
<td>-1.55 - 1.66</td>
<td>2.29</td>
<td>-.31 .19</td>
<td>14.60***</td>
</tr>
<tr>
<td>Too much alcohol</td>
<td>-.63 - 1.27</td>
<td>30.40***</td>
<td>.51 .36</td>
<td>.10</td>
</tr>
<tr>
<td>Unhealthy foods</td>
<td>-.34 - .52</td>
<td>3.00</td>
<td>.58 .83</td>
<td>4.35*</td>
</tr>
<tr>
<td>Drink-driving</td>
<td>-1.33 - 1.63</td>
<td>12.31***</td>
<td>-.33 -.04</td>
<td>4.39*</td>
</tr>
<tr>
<td>Too little exercise</td>
<td>-.27 -.26</td>
<td>.00</td>
<td>.18 .19</td>
<td>.03</td>
</tr>
<tr>
<td>Obesity</td>
<td>-.86 - 1.79</td>
<td>.33</td>
<td>-.15 .27</td>
<td>11.56***</td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>-1.15 - .05</td>
<td>.83</td>
<td>-.26 -.13</td>
<td>1.23</td>
</tr>
<tr>
<td>Too much stress</td>
<td>.43 .36</td>
<td>.32</td>
<td>1.01 1.03</td>
<td>.04</td>
</tr>
<tr>
<td>Environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain+</td>
<td>-.77 - .81</td>
<td>.22</td>
<td>-.38 -.14</td>
<td>6.18**</td>
</tr>
<tr>
<td>Toxic waste</td>
<td>-.99 - 1.19</td>
<td>4.09*</td>
<td>-.60 -.17</td>
<td>13.39***</td>
</tr>
<tr>
<td>Chemicals in food</td>
<td>-.79 - 1.10</td>
<td>8.21*</td>
<td>-.50 -.08</td>
<td>12.71***</td>
</tr>
<tr>
<td>Homicide victim</td>
<td>-1.19 - 1.24</td>
<td>.22</td>
<td>-.61 -.32</td>
<td>4.84*</td>
</tr>
<tr>
<td>Acid rain</td>
<td>-.35 -.40</td>
<td>.21</td>
<td>.16 .03</td>
<td>1.53</td>
</tr>
<tr>
<td>Fire</td>
<td>-.85 - .79</td>
<td>0.26</td>
<td>-.27 -.15</td>
<td>.82</td>
</tr>
<tr>
<td>Earthquake</td>
<td>-1.22 - .99</td>
<td>4.31*</td>
<td>-.97 -.75</td>
<td>3.88*</td>
</tr>
<tr>
<td>Air pollution</td>
<td>.03 .07</td>
<td>.15</td>
<td>-.13 .46</td>
<td>7.64**</td>
</tr>
</tbody>
</table>

* p<.05; ** p<.01; *** p<.0001  
a Male, b Female  
+ F is result of MANOVA  
Other indicated F is result of univariate ANOVA.
In Self Risk judgment ratings, there were significant mean differences in the Lifestyle domain between male and female adolescents \(F(1, 410)=7.47, p<.01\). Univariate ANOVAs for each risk event indicated that female adolescents estimated their chances at risk as lower than those of males ['heart attack' \(F=50.00\); 'smoking' \(F=32.60\); 'alcohol' \(F=30.40\); 'cancer' \(F=19.27\); and, 'drink-driving' \(F=12.31\), all \(p<.0001\)].

Although there were no statistical differences for Self Risk ratings in the Health domain and Environment domain, as can be seen in Table 4.3, the perception of female adolescents was significantly different from that of males in the mean scores of 'heart attack', 'cancer', 'influenza', 'chemicals in food', 'earthquake' 'serious car injury' and 'toxic waste' \(F=50.00, 19.27, 16.00, p<.0001; F=8.21, p<.01; F=4.31, 4.22, 4.09, p<.05,\) respectively).

With regard to other health risk events, both male and female adolescents perceived themselves as being vulnerable to 'tooth decay', 'influenza', 'stress' and 'air pollution'. It appeared that both groups acknowledged risk where consequences were possibly not severe and the events possibly could not be avoided.

In the case of Other Risk judgment ratings, again Table 4.3 presents the results. Significant differences emerged from MANOVAs for all three domains \(F(1, 410)=32.62\) for the Health domain, \(F(1, 410)=43.97\) for the Lifestyle domain and \(F(1,
410) = 13.39 for the Environment domain, all p < .0001. Univariate ANOVAs revealed substantial differences in optimistic bias between male and female adolescents in risk events such as 'AIDS', 'heart attack', 'smoking', 'drugs', 'toxic waste', 'chemicals in food', 'diabetes' and 'obesity' [F(1, 410) = 33.26, 30.15, 23.70, 14.60, 13.39, 12.71, 12.57, 11.56, all p < .0001, respectively].

Hence, the study indicated that female adolescents tended to perceive their own chances of health risks as lower than those of other people, when compared with male adolescents.

A similar analytic process was carried out to compare Self and Other Risk ratings by cultural setting. The results are displayed in Table 4.4 for both the univariate and multivariate analyses.

Table 4.4
Results of the Univariate and Multivariate F-test for Each Health Risk by the Different Cultural Settings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self Risk Rating</th>
<th></th>
<th>Other Risk Rating</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seoul Sydney</td>
<td>F-value</td>
<td>Seoul Sydney</td>
<td>F-value</td>
</tr>
<tr>
<td>Health Domain+</td>
<td>-.56 -.44</td>
<td>2.57</td>
<td>-.28 -.20</td>
<td>.11</td>
</tr>
<tr>
<td>Broken bone</td>
<td>-.55 -.35</td>
<td>2.57</td>
<td>-.31 .67</td>
<td>9.88**</td>
</tr>
<tr>
<td>AIDS</td>
<td>-1.73 -1.40</td>
<td>16.83***</td>
<td>-.45 .25</td>
<td>33.55***</td>
</tr>
<tr>
<td>Cancer</td>
<td>-.90 -.67</td>
<td>3.63*</td>
<td>-.11 -.33</td>
<td>3.62*</td>
</tr>
<tr>
<td>Diabetes</td>
<td>-.89 -1.05</td>
<td>1.71</td>
<td>-.26 .05</td>
<td>6.80**</td>
</tr>
<tr>
<td>Serious car injury</td>
<td>-.43 -.62</td>
<td>2.55</td>
<td>.55 -.04</td>
<td>19.32***</td>
</tr>
<tr>
<td>Heart attack</td>
<td>-1.21 -.65</td>
<td>24.99***</td>
<td>-.41 -.31</td>
<td>.37</td>
</tr>
<tr>
<td>Tooth decay</td>
<td>.36 .13</td>
<td>2.69</td>
<td>.96 .55</td>
<td>13.34***</td>
</tr>
<tr>
<td>Influenza</td>
<td>.85 1.05</td>
<td>2.82</td>
<td>1.37 1.08</td>
<td>6.94**</td>
</tr>
</tbody>
</table>
Table 4.4 (Continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Self Risk Rating</th>
<th>Other Risk Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Seoul Sydney F-value</td>
<td>Seoul Sydney F-value</td>
</tr>
<tr>
<td><strong>Lifestyle Domain</strong>+</td>
<td>-.64 -.94 14.92***</td>
<td>-.55 -.05 68.62***</td>
</tr>
<tr>
<td>Smoke cigarettes</td>
<td>-.93 -.76 2.15 1.01</td>
<td>.33 30.55***</td>
</tr>
<tr>
<td>Take illicit drugs</td>
<td>-1.73 -1.49 11.31***</td>
<td>-.07 -.04 .03</td>
</tr>
<tr>
<td>Too much alcohol</td>
<td>-.67 -1.26 26.32***</td>
<td>.90 .07 47.75***</td>
</tr>
<tr>
<td>Unhealthy foods</td>
<td>-.47 -.40 .36</td>
<td>.42 1.00 24.26***</td>
</tr>
<tr>
<td>Drink-driving</td>
<td>-1.37 -1.60 6.46*</td>
<td>-.30 -.06 3.57</td>
</tr>
<tr>
<td>Too little exercise</td>
<td>-.05 -.48 10.80***</td>
<td>.86 -.49 159.62***</td>
</tr>
<tr>
<td>Obesity</td>
<td>-.49 -1.17 26.39***</td>
<td>.48 -.34 44.99***</td>
</tr>
<tr>
<td>Attempted suicide</td>
<td>-.91 -1.28 9.69***</td>
<td>.13 -.51 28.53***</td>
</tr>
<tr>
<td>Too much stress</td>
<td>.81 -.03 55.08***</td>
<td>1.32 .71 32.78***</td>
</tr>
<tr>
<td><strong>Environment Domain</strong>+</td>
<td>-.46 -.11 56.78***</td>
<td>-.12 -.63 59.60***</td>
</tr>
<tr>
<td>Toxic waste</td>
<td>-.82 -1.38 31.46***</td>
<td>-.68 -.07 26.50***</td>
</tr>
<tr>
<td>Chemicals in food</td>
<td>-.46 -1.44 82.32***</td>
<td>-.69 .12 47.87***</td>
</tr>
<tr>
<td>Homicide victim</td>
<td>-1.33 -1.09 5.42*</td>
<td>-.46 -.46 .00</td>
</tr>
<tr>
<td>Acid rain</td>
<td>.42 -1.17 175.28***</td>
<td>.84 -.66 198.92***</td>
</tr>
<tr>
<td>Fire</td>
<td>-.71 -1.93 3.73*</td>
<td>-.33 -.08 3.68*</td>
</tr>
<tr>
<td>Earthquake</td>
<td>-.99 -1.21 3.70*</td>
<td>-.57 -.15 25.64***</td>
</tr>
<tr>
<td>Air pollution</td>
<td>.67 -1.56 109.98***</td>
<td>.05 -.44 156.47***</td>
</tr>
</tbody>
</table>

* p<.05; ** p<.01; *** p<.0001
+ F is result of MANOVA
  Other indicated F is result of univariate ANOVA.

In the Self Risk judgment ratings, there were significant mean differences between adolescents in Seoul and those in Sydney in the Lifestyle domain and the Environment domain [F(1, 410)=14.92, 56.78, all p<.0001, respectively].

According to Table 4.4, adolescents in Sydney reported high unrealistic perception in most of the health risk items, while
adolescents in Seoul estimated their risk perception for 'heart attack', 'AIDS', 'drugs', 'homicide' and 'cancer' as substantially lower compared to the Sydney sub sample \([F(1, 410)=24.99, 16.83\) and \(11.31, p<.0001; F(1, 410)=5.42\) and \(3.63, p<.05, \) respectively].

Likewise, as can be seen in Table 4.4 there were statistical mean differences between adolescents in the different cultural settings in the Other Risk judgment ratings \([F(1, 410)=68.62\) for the Lifestyle domain and \(59.60\) for the Environment domain, \(p<.0001\)]. However, in contrast with the univariate ANOVAs of Self Risk judgment adolescents in Seoul had higher optimistic bias in most of health risk events than those in Sydney with exceptions being 'acid rain' and 'cancer'. Interestingly, adolescents in Seoul reported themselves as being vulnerable to 'air pollution', 'acid rain', 'influenza' and 'stress' in both Self and Other Risk Judgment ratings.

4.4. Research Question Three

Research question three examined differences in health profile of adolescents according to gender and the two different cultural settings.

Subjects were asked to complete a questionnaire regarding their own health promoting profile. A numerical value was assigned to each item which required a response that indicated
A frequency of behaviour or concern. All items were scored on a scale from one to four: 1=never, 2=sometimes, 3=often and 4=routinely.

A descriptive analysis of means and standard deviations was conducted for each item to determine the health promoting profile and also a t-test was conducted for each item to investigate the differences in health profiles according to gender and cultural setting. The results from these analyses are reported out in Table 4.5 which displays the mean scores of the six subscales of the Health Promoting Lifestyle Profile [HPLP] and each item which demonstrated statistically significant differences in health profile across gender.

Table 4.5
The Mean Scores for the HPLP Subscales by Gender

<table>
<thead>
<tr>
<th>Items</th>
<th>Male M</th>
<th>Male SD</th>
<th>Female M</th>
<th>Female SD</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualisation</td>
<td>2.83</td>
<td>.46</td>
<td>2.78</td>
<td>.42</td>
<td>1.18</td>
</tr>
<tr>
<td>satisfying environment</td>
<td>3.47</td>
<td>.71</td>
<td>3.29</td>
<td>.86</td>
<td>2.23*</td>
</tr>
<tr>
<td>look forward to future</td>
<td>2.42</td>
<td>.95</td>
<td>2.12</td>
<td>.97</td>
<td>3.19**</td>
</tr>
<tr>
<td>Health Responsibility</td>
<td>2.20</td>
<td>.67</td>
<td>2.24</td>
<td>.66</td>
<td>-.70</td>
</tr>
<tr>
<td>Exercise</td>
<td>2.42</td>
<td>.83</td>
<td>2.45</td>
<td>.84</td>
<td>-.35</td>
</tr>
<tr>
<td>Nutrition</td>
<td>2.68</td>
<td>.60</td>
<td>2.68</td>
<td>.62</td>
<td>.02</td>
</tr>
<tr>
<td>Interpersonal Support</td>
<td>2.59</td>
<td>.44</td>
<td>2.60</td>
<td>.49</td>
<td>-.28</td>
</tr>
<tr>
<td>meaningful relationships</td>
<td>2.97</td>
<td>.97</td>
<td>2.67</td>
<td>1.03</td>
<td>3.05**</td>
</tr>
<tr>
<td>express concern/love</td>
<td>2.39</td>
<td>1.26</td>
<td>2.64</td>
<td>1.20</td>
<td>-2.10*</td>
</tr>
<tr>
<td>Stress Management</td>
<td>2.40</td>
<td>.73</td>
<td>2.36</td>
<td>.69</td>
<td>.53</td>
</tr>
<tr>
<td>relax before sleep</td>
<td>2.40</td>
<td>1.05</td>
<td>2.66</td>
<td>1.18</td>
<td>-2.35*</td>
</tr>
</tbody>
</table>

* p<.05; ** p<.01

According to Table 4.5 there were no differences between male and female adolescents in all six sub dimensions of the HPLP.
There were however, statistically significant mean differences between gender in certain components of the sub dimensions ['look forward to future' (t=3.19); 'meaningful relationships' (t=3.05), p<.01; 'relax before sleep' (t=-2.35); 'satisfying environments' (t=2.23); and, 'express love' (t=-2.10), all p<.05].

In contrast with the results in health profiles between male and female adolescents there were substantial differences in health profiles between the two different cultural settings. Table 4.6 shows the differences in the six sub dimensions of health profiles by cultural setting.

Table 4.6
The Mean Scores for the HPLP Subscales by the Different Cultural Settings

<table>
<thead>
<tr>
<th>Items</th>
<th>Seoul Sample M</th>
<th>SD</th>
<th>Sydney Sample M</th>
<th>SD</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualisation</td>
<td>2.91</td>
<td>.42</td>
<td>2.70</td>
<td>.43</td>
<td>5.10**</td>
</tr>
<tr>
<td>respect accomplishments</td>
<td>3.10</td>
<td>.90</td>
<td>2.09</td>
<td>.98</td>
<td>10.97**</td>
</tr>
<tr>
<td>life has purpose</td>
<td>3.10</td>
<td>.97</td>
<td>1.72</td>
<td>.86</td>
<td>15.30**</td>
</tr>
<tr>
<td>like myself</td>
<td>2.81</td>
<td>.88</td>
<td>3.20</td>
<td>.89</td>
<td>-4.48**</td>
</tr>
<tr>
<td>feel happy/content</td>
<td>2.65</td>
<td>.90</td>
<td>3.16</td>
<td>.91</td>
<td>-5.72**</td>
</tr>
<tr>
<td>know what is important</td>
<td>3.01</td>
<td>.93</td>
<td>2.10</td>
<td>.98</td>
<td>10.80**</td>
</tr>
<tr>
<td>Health Responsibility</td>
<td>1.84</td>
<td>.61</td>
<td>2.61</td>
<td>.45</td>
<td>-14.73**</td>
</tr>
<tr>
<td>check cholesterol level</td>
<td>1.39</td>
<td>.71</td>
<td>2.65</td>
<td>.90</td>
<td>-15.77**</td>
</tr>
<tr>
<td>discuss health concerns</td>
<td>1.52</td>
<td>.81</td>
<td>3.42</td>
<td>.82</td>
<td>-23.84**</td>
</tr>
<tr>
<td>check blood pressure</td>
<td>1.93</td>
<td>.96</td>
<td>3.42</td>
<td>.82</td>
<td>-17.06**</td>
</tr>
<tr>
<td>seek information</td>
<td>2.41</td>
<td>1.04</td>
<td>3.14</td>
<td>.94</td>
<td>-7.52**</td>
</tr>
<tr>
<td>Exercise</td>
<td>1.83</td>
<td>.65</td>
<td>3.03</td>
<td>.49</td>
<td>-21.31**</td>
</tr>
<tr>
<td>exercise 3 times a week</td>
<td>1.91</td>
<td>1.06</td>
<td>2.66</td>
<td>.94</td>
<td>-7.64**</td>
</tr>
<tr>
<td>supervised programs</td>
<td>1.50</td>
<td>.86</td>
<td>3.42</td>
<td>.82</td>
<td>-23.32**</td>
</tr>
<tr>
<td>recreational activities</td>
<td>2.64</td>
<td>1.09</td>
<td>3.33</td>
<td>.77</td>
<td>-7.42**</td>
</tr>
</tbody>
</table>
Table 4.6 (Continued)

<table>
<thead>
<tr>
<th>Items</th>
<th>Seoul Sample</th>
<th>Sydney Sample</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>check pulse rate</td>
<td>1.27</td>
<td>.63</td>
<td>2.74</td>
</tr>
<tr>
<td><strong>Nutrition</strong></td>
<td>2.64</td>
<td>.69</td>
<td>2.71</td>
</tr>
<tr>
<td>no preservatives</td>
<td>2.80</td>
<td>.92</td>
<td>3.04</td>
</tr>
<tr>
<td><strong>Interpersonal Support</strong></td>
<td>2.56</td>
<td>.47</td>
<td>2.63</td>
</tr>
<tr>
<td>praise others easily</td>
<td>2.73</td>
<td>.94</td>
<td>2.39</td>
</tr>
<tr>
<td>meaningful relationships</td>
<td>3.10</td>
<td>.89</td>
<td>2.53</td>
</tr>
<tr>
<td>time with close friends</td>
<td>3.10</td>
<td>.93</td>
<td>1.93</td>
</tr>
<tr>
<td>express concern/love</td>
<td>1.61</td>
<td>.86</td>
<td>3.42</td>
</tr>
<tr>
<td><strong>Stress Management</strong></td>
<td>1.89</td>
<td>.51</td>
<td>2.88</td>
</tr>
<tr>
<td>daily relaxation time</td>
<td>1.46</td>
<td>.73</td>
<td>2.71</td>
</tr>
<tr>
<td>aware of stress sources</td>
<td>2.47</td>
<td>1.08</td>
<td>3.11</td>
</tr>
<tr>
<td>relax before sleep</td>
<td>1.90</td>
<td>.94</td>
<td>3.17</td>
</tr>
</tbody>
</table>

* p<.01; **p<.0001

Table 4.6 illustrates that all sub dimensions of the Health Promoting Profile, except for Nutrition and Interpersonal Support, demonstrated statistically significant mean differences in adolescents health profiles between the two different cultural settings (t=-21.31 for Exercise, t=-19.74 for Stress Management, t=-14.73 for Health Responsibility and t=5.10 for Self-actualisation, all p<.0001). In Self-actualisation adolescents in Seoul reported higher scores on 'life has purpose', 'respect accomplishments' and 'know what is important' than those in Sydney (t=15.30, 10.97 and 10.80, all p<.0001, respectively).

In contrast, the study indicated that adolescents in Sydney reported having more chances to participate in health-related
activities than those in Seoul (for example, $t = -23.84$ for 'discuss health concerns', $t = -23.32$ for 'supervised programs').

4.5. Research Question Four

Research question four investigated differences in psychological variables of adolescents according to gender and the different cultural settings.

Data were obtained by asking subjects to answer the questionnaires with regard to the selected psychological variables: Internal Health Locus of Control; Powerful Other Health Locus of Control; Chance Health Locus of Control; Self-efficacy; and, Self-esteem.

For Health Locus of Control the summated rating technique was used and numerical value was assigned for each of the six possible answers. For statements in which a favourable response was desired a "strongly agree" was allocated a numerical value of six and a "strongly disagree" a numerical value of one.

For Self-efficacy a score of 14 indicated "strongly agree" and a score of one indicated "strongly disagree" toward the statement. The larger the score, the greater the self-efficacy expectation. Individuals scoring above this mean were
considered high in self-efficacy and those scoring below the mean were considered low in self-efficacy.

In the case of Self-esteem a numerical value was assigned for each of the four possible answers. A score of four on an item indicated "strongly agree" and a score of one indicated "strongly disagree" toward the statement. The total score of each respondent was considered an indication of value of self-esteem.

A descriptive analysis of means and standard deviations was conducted for each questionnaire to determine the degree of individuals' beliefs, perceptions, self-reliability, life satisfaction and ability to control health. Also a t-test conducted for each questionnaire to examine the differences in psychological variables of individuals across gender and cultural differences. The results from these analyses are reported out in Table 4.7 which displays the mean scores of the five psychological variables across gender.
<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Male M</th>
<th>SD</th>
<th>Female M</th>
<th>SD</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal health locus of control</td>
<td>4.69</td>
<td>.80</td>
<td>4.31</td>
<td>.86</td>
<td>2.13*</td>
</tr>
<tr>
<td>Powerful other health locus of control</td>
<td>3.03</td>
<td>.69</td>
<td>3.30</td>
<td>.77</td>
<td>-3.59**</td>
</tr>
<tr>
<td>Chance health locus of control</td>
<td>3.16</td>
<td>.71</td>
<td>3.18</td>
<td>.77</td>
<td>-.38</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>7.72</td>
<td>1.10</td>
<td>7.71</td>
<td>1.21</td>
<td>-.03</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>2.36</td>
<td>.29</td>
<td>2.30</td>
<td>.31</td>
<td>1.98*</td>
</tr>
</tbody>
</table>

*p<.05; **p<.001

Results suggested a gender difference in individuals' beliefs, self-reliability, life satisfaction and ability to control health. There were significant differences between male and female adolescents in Powerful Other Health Locus of Control (t=-3.59, p<.001), Internal Health Locus of Control (t=2.13, p<.05) and Self-esteem (t=1.98, p<.05). According to Table 4.7, male adolescents rated higher scores on Internal Health Locus of Control and Self-esteem than females, while females reported higher scores on Powerful Other Health Locus of Control than males.

The results concerning gender differences in adolescents' psychological variables indicated that, in general terms, male adolescents suggested their health status related to their own
beliefs or decisions demonstrating a high internal controllability to health self-reliability and life satisfaction. Female adolescents suggested their health was determined by significant others.

In addition, research question four investigated differences in psychological variables across different cultural setting. Table 4.8 shows the differences in the five psychological variables by cultural setting.

Table 4.8
The Mean Scores for the Five Psychological Variables by the Different Cultural Settings

<table>
<thead>
<tr>
<th>Psychological Variables</th>
<th>Seoul M</th>
<th>Sample SD</th>
<th>Sydney M</th>
<th>Sample SD</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal health locus of control</td>
<td>4.52</td>
<td>.77</td>
<td>4.22</td>
<td>.89</td>
<td>3.59*</td>
</tr>
<tr>
<td>Powerful other health locus of control</td>
<td>5.19</td>
<td>.73</td>
<td>5.15</td>
<td>.76</td>
<td>.58</td>
</tr>
<tr>
<td>Chance health locus of control</td>
<td>4.98</td>
<td>.71</td>
<td>5.03</td>
<td>.73</td>
<td>.54</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>7.46</td>
<td>1.11</td>
<td>7.98</td>
<td>1.10</td>
<td>-4.78*</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>2.25</td>
<td>.33</td>
<td>2.40</td>
<td>.25</td>
<td>-5.47*</td>
</tr>
</tbody>
</table>

* p<.001

Table 4.8 illustrated that some of psychological variables demonstrated statistically significant mean differences in adolescents' beliefs, perception, self-reliability, life satisfaction and ability to control health between the two different cultural
settings (t=-5.47 for Self-esteem, t=-4.78 for Self-efficacy and t=3.59 for Internal Health Locus of Control, all p<.001). In Health Locus of Control there were no statistical differences in Powerful Other Health Locus of Control and Chance Health Locus of Control, but adolescents in Seoul rated higher scores on Internal Health Locus of Control than those in Sydney.

In contrast, the results pointed out that adolescents in Sydney reported higher scores on Self-efficacy and Self-esteem, suggesting enhanced self-reliability and general life satisfaction compared to their Seoul peers.

4.6. Research Question Five

Research question five investigated a possible relationship between the five psychological variables and health risk perception and health profile.

In order to investigate a possible relationship between psychological variables (Internal Health Locus of Control, Powerful Other Health Locus of Control, Chance Health Locus of Control, Self-efficacy and Self-esteem) and the domains in Health Risk Perception and the dimensions in Health Profile a regression analysis was conducted. A linear regression analysis produced the standardised regression weights, indicating linear dependencies of dependent variables on independent variables. In addition, it displayed a squared multiple
correlation for each dependent variable. A variable's squared multiple correlation explains the proportion of its variance that was accounted for by its predictors.

Table 4.9 reports standardised regression weights to indicate the relationship of each psychological variable with the domains/dimensions in Health Risk Perception and Health Profile.

Table 4.9
The Standardised Regression Weights of Each Psychological Variable on Health Risk Perception and Health Profile

<table>
<thead>
<tr>
<th>Health Risk Perception</th>
<th>Locus1&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Locus2&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Locus3&lt;sup&gt;c&lt;/sup&gt;</th>
<th>Self-efficacy</th>
<th>Self-esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>-.26&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.31&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.14&lt;sup&gt;**&lt;/sup&gt;</td>
<td>-.23&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.31&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>-.55&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.27&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.39&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.32&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.28&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>Environment</td>
<td>-.56&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.17&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.55&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.20&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.25&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>Health Profile</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-actualisation</td>
<td>.04</td>
<td>.34&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.16&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.50&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.32&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>Health responsibility</td>
<td>-.13&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.21&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.50&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.29&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.10&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Exercise</td>
<td>-.05</td>
<td>-.05</td>
<td>-.55&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.14&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.04</td>
</tr>
<tr>
<td>Nutrition</td>
<td>.15&lt;sup&gt;**&lt;/sup&gt;</td>
<td>.26&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.06</td>
<td>.31&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.16&lt;sup&gt;**&lt;/sup&gt;</td>
</tr>
<tr>
<td>Interpersonal support</td>
<td>-.03</td>
<td>.33&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.08</td>
<td>.52&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.28&lt;sup&gt;***&lt;/sup&gt;</td>
</tr>
<tr>
<td>Stress management</td>
<td>-.11&lt;sup&gt;*&lt;/sup&gt;</td>
<td>.11&lt;sup&gt;*&lt;/sup&gt;</td>
<td>-.55&lt;sup&gt;***&lt;/sup&gt;</td>
<td>.29&lt;sup&gt;***&lt;/sup&gt;</td>
<td>-.12&lt;sup&gt;*&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup>: internal health locus of control, <sup>b</sup>: chance health locus of control and <sup>c</sup>: powerful other health locus of control

*p<.05; **p<.01; ***p<.0001
According to the standardised regression weights, all psychological variables significantly impacted on almost all of dimensions in Health Risk Perception and Health Profile, identifying that psychological variables may make significant contributions in predicting health risk perception and health profile.

The use of AMOS allowed Internal Health Locus of Control, Powerful Other Health Locus of Control, Chance Health Locus of Control, Self-efficacy and Self-esteem to be treated as one factor and the possible relationship between the constructed psychological factor, and the subdomains of health risk perception and health profile investigated.

The squared multiple correlations which indicate the strength of association between the total psychological factor and the domains/dimensions in Health Risk Perception and Health Profile were calculated and are shown in Table 4.10.

Table 4.10
The Squared Multiple Correlations of the Sub Domains in Health Risk Perception and Health Profile with the Constructed Psychological Factor

<table>
<thead>
<tr>
<th>Domains in Health Risk Perception</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>.33</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>.66</td>
</tr>
<tr>
<td>Environment</td>
<td>.72</td>
</tr>
</tbody>
</table>
Table 4.10 (Continued)

<table>
<thead>
<tr>
<th>Dimensions in Health Profile</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualisation</td>
<td>.50</td>
</tr>
<tr>
<td>Health responsibility</td>
<td>.40</td>
</tr>
<tr>
<td>Exercise</td>
<td>.32</td>
</tr>
<tr>
<td>Nutrition</td>
<td>.21</td>
</tr>
<tr>
<td>Interpersonal support</td>
<td>.46</td>
</tr>
<tr>
<td>Stress management</td>
<td>.43</td>
</tr>
</tbody>
</table>

All of the domains/dimensions in Health Risk Perception and Health Profile were significantly correlated with the Psychological Factor ($p<.01$). Of the three domains in Health Risk Perception, 72 percent of Environment was associated with Psychological Factor, 66 percent of Lifestyle Factors and 33 percent of General Health had a relationship with Psychological Factors. In addition, in Health Profile, Self-actualisation showed the highest proportion with 50 percent explained by Psychological Factor. Interpersonal Support with 46 percent, Stress Management with 43 percent, Health Responsibility with 40 percent, Exercise with 32 percent and Nutrition with 21 percent were explained by Psychological Factors.

An important part of any statistical procedure that builds models from data is establishing how well the model actually fits. The assessment of fit between the hypothesised model and the sample data is an important issue associated with the analysis of structure models (Bentler, 1990).
The AMOS program used in this study provided the indices of fit for the model; the chi-square with its degrees of freedom and probability, the Goodness-of-Fit Index [GFI] and the Root Mean square Residual [RMR].

Chi-square and its probability are estimated on a basis of normal distribution of sample data. According to Bentler and Bonett (1980), when the sample size is sufficiently large, Chi-square is a likelihood ratio test statistics that can be used to test the fit between the hypothesised model and the sample data.

Jöreskog and Sörbom (1984) devised the Goodness-of-Fit Index [GFI] for testing a model fit between the hypothesised model and the observed data. The GFI indicates the relative amount of variance and covariance jointly explained by the model, and is always between zero and one, where one indicates a perfect fit.

The Root Mean square Residual [RMR] is the square root of the average squared amount by which the sample variances and covariances differ from their estimates obtained under the assumption (Arbuckle, 1997). It ranges from zero to one, and the RMR of zero indicates a perfect fit. Table 4.11 shows the indices of fit for the hypothetical regression model proposed in Chapter 3.
Table 4.11
The Indices of Fit for the Regression Analysis Model

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square</td>
<td>257.46</td>
</tr>
<tr>
<td>Degree of freedom</td>
<td>134</td>
</tr>
<tr>
<td>Probability</td>
<td>.12</td>
</tr>
<tr>
<td>Root mean square residual (RMR)</td>
<td>.05</td>
</tr>
<tr>
<td>Goodness of fit index (GFI)</td>
<td>.91</td>
</tr>
</tbody>
</table>

Goodness of Fit Index .91 and the .05 RMR indicated that the proposed regression model was an adequate fit to identify a possible relationship between the psychological variables and the domains/dimensions in Health Risk Perception and Health Profile and a relationship between the Psychological Factor and the domains/dimensions in Health Risk Perception and Health Profile.

After the analysis of the data all of the significant weights (both standardised regression weights and squared multiple correlation coefficients) are shown in Figure 4.1.
Figure 4.1 An Output Paradigm of Regression Analysis Model between Psychological Variables and the Sub Domains in Health Risk Perception and Health Profile.
Data indicate that the model proposed in the initial phase of regression analysis was effective to identify a relationship of the psychological factor with health risk perception and health profile. In this figure, single-headed arrows drawn from each psychological variable to the domains of Health Risk Perception and the dimensions of Health Profile, represented the standardised regression weights and revealed that the five psychological variables had direct effects on almost all of domains/dimensions in Health Risk Perception and Health Profile.

In terms of Health Risk Perception, all of the five psychological variables had significant contributions to the three domains (e.g., General Health, Lifestyle Factors and Environment). For Health Profile, however, although this model indicated an effect of psychological variables, it was not clear that the psychological variables had a significant contribution to overall stability of the Health Profile. The results concerning a relationship between the five psychological variables and the dimensions of Health Profile indicated that Exercise did not statistically depend on Internal Health Locus of Control, Chance Health Locus of Control and Self-esteem. Interpersonal Support did not have linear dependencies on Internal Health Locus of control and Powerful Other Health Locus of Control.

Figure 4.1 also illustrates the strength of the relationship between the total psychological factor and the domains of
Health Risk Perception and the dimensions of the Health Profile. As shown in this figure, the Psychological Factor had a significant correlation with the domains of Health Risk Perception and the dimensions of Health Profile. Among the domains in Health Risk Perception Environment and Lifestyle Factors scored high squared multiple correlations with Psychological Factor (.72 and .66).

4.7. Research Question Six

Research question six identified a possible relationship between health risk perception, health profile and the psychological factor.

To determine a possible relationship between indicator variables and their underlying latent variables a confirmatory factor analysis was conducted and standardised regression weights were used to assess a possible relationship of indicator variables (Health, Self-esteem, Stress Management etc.) with their underlying latent variables (Health Risk Perception, Health Profile and Psychological Factor). There are reported in Table 4.12.
Table 4.12
The Standardised Regression Weights of the Latent Variables on Their OwnIndicator Variables

<table>
<thead>
<tr>
<th>Indicator Variables in Health Risk Perception</th>
<th>Psychological Factor</th>
<th>Health Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Health perception</td>
<td>Psychological factor</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>.82**</td>
<td>-</td>
</tr>
<tr>
<td>Environment</td>
<td>.87**</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Variables in Psychological Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Locus2&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Locus3&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Self-efficacy</td>
</tr>
<tr>
<td>Self-esteem</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Variables in Health Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualisation</td>
</tr>
<tr>
<td>Health responsibility</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Nutrition</td>
</tr>
<tr>
<td>Interpersonal support</td>
</tr>
<tr>
<td>Stress management</td>
</tr>
</tbody>
</table>

<sup>a</sup>: internal health locus of control, <sup>b</sup>: chance health locus of control and <sup>c</sup>: powerful other health locus of control, *p<.05; **p<.0001

As shown in Table 4.12 all of the indicator variable weights on their underlying constructs were statistically significant. Thus, it may be statistically accepted that each latent variable was explained by its own indicator variables.

For health risk perception the standardised regression weights, referred to as the strength of effects, showed direct high...
effects for all three indicator variables (.82 for General Health, .92 for Lifestyle Factors and .87 for Environment) on the latent variables. In the case of Health Profile the indicator variables, exercise, health responsibility and stress management exhibited high standardised regression weights in explaining latent variables (.86, .85, .80, all \(p<.0001\), respectively). The Psychological Factor had a linear relationship with its five indicator variables: .78 for Powerful Other Health Locus of Control, .56 for Chance Health Locus of Control, -.37 for Self-efficacy, -.37 for Self-esteem and .36 for Internal Health Locus of Control, all \(p<.0001\).

A squared multiple correlation, further examined the strength of association between each latent variable and its own indicator variables and is reported out in Table 4.13.

Table 4.13
The Squared Multiple Correlations of Each Indicator Variable with Its Underlying Latent Variable

<table>
<thead>
<tr>
<th>Indicator Variables in Health Risk Perception</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>.68</td>
</tr>
<tr>
<td>Lifestyle</td>
<td>.84</td>
</tr>
<tr>
<td>Environment</td>
<td>.72</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicator Variables in Psychological Factor</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locus1(^a)</td>
<td>.28</td>
</tr>
<tr>
<td>Locus2(^b)</td>
<td>.31</td>
</tr>
<tr>
<td>Locus3(^c)</td>
<td>.61</td>
</tr>
<tr>
<td>Self-efficacy</td>
<td>.24</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>.24</td>
</tr>
</tbody>
</table>
Table 4.13 (Continued)

<table>
<thead>
<tr>
<th>Indicator Variables in Health Profile</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-actualisation</td>
<td>.02</td>
</tr>
<tr>
<td>Health responsibility</td>
<td>.73</td>
</tr>
<tr>
<td>exercise</td>
<td>.75</td>
</tr>
<tr>
<td>Nutrition</td>
<td>.07</td>
</tr>
<tr>
<td>Interpersonal support</td>
<td>.15</td>
</tr>
<tr>
<td>Stress management</td>
<td>.66</td>
</tr>
</tbody>
</table>

a: internal health locus of control; b: chance health locus of control; c: powerful other health locus of control

Among three indicator variables of Health Risk Perception, 84 percent of Lifestyle Factors accounted for the Health Risk Perception and 72 percent of Environment and 68 percent of General Health explained Health Risk Perception. In Health Profile, in addition, Exercise, Health Responsibility and Stress Management showed a high coefficient in explaining Health Profile (75 percent, 73 percent and 66 percent, respectively). However, the standardised multiple correlation coefficient indicated that the variation of Self-actualisation and Nutrition was low in explaining Health Profile in this study. For a relation of the five indicator variables with the Psychological Factor all indicator variables (Internal Locus of Control, Powerful Other Locus of Control, Chance Locus of Control, Self-efficacy and Self-esteem) were substantially correlated with the Psychological Factor.
Table 4.14 displays correlations between the three latent variables: health risk perception, health profile and psychological factor.

Table 4.14
Correlations between the Three Latent Variables

<table>
<thead>
<tr>
<th></th>
<th>Psychological Factor</th>
<th>Health Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health Risk Perception</td>
<td>.53</td>
<td>-.31</td>
</tr>
<tr>
<td>Health Profile</td>
<td>-.70</td>
<td></td>
</tr>
</tbody>
</table>

The three latent variables were all significantly correlated (p<.01) with one another: .53 for Health Risk Perception with the Psychological Factor, -.70 for the Psychological Factor with Health Profile and -.31 for Health Risk Perception with Health Profile.

In order to test fit of the hypothetical confirmatory factor analysis model posited in Chapter 3, Table 4.13 presents the chi-square with its degree of freedom and probability, the Goodness-of-Fit Index [GFI] and the Root Mean square Residual [RMR].

Table 4.15
The Indices of Fit for the Confirmatory Factor Analysis Model

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square</td>
<td>563.70</td>
</tr>
<tr>
<td>Degree of freedom</td>
<td>167</td>
</tr>
<tr>
<td>Probability</td>
<td>.08</td>
</tr>
<tr>
<td>Root Mean square Residual (RMR)</td>
<td>.04</td>
</tr>
<tr>
<td>Goodness-of-Fit Index (GFI)</td>
<td>.93</td>
</tr>
</tbody>
</table>
According to Table 4.15, the Goodness-of-Fit Index (GFI) .93 and the .04 Root Mean square Residual (RMR) suggest the confirmatory factor analysis model was an adequate fit and a causal relationship between health risk perception, health behaviour and psychological factor.

As well as the output paradigm of the regression analysis model, all of the significant weights (e.g. standardised regression weights, squared multiple correlation coefficients and correlation coefficients) are depicted in Figure 4.2.
Figure 4.2 An Output Paradigm of Factor Analysis Model between Health Risk Perception, Health Profile and Psychological Factor.
In Figure 4.2, single-headed arrows drawn from each latent variable to its own indicator variables, indicate the standardised regression weights, revealed that each latent variable was well explained by its own indicator variables. According to both the standardised regression weights and the standardised multiple correlation weights, among the three latent variables, Health Risk Perception not only was best explained by its own indicator variables (.82 for General Health, .92 for Lifestyle Factor and .87 for Environment), but also showed a high squared multiple correlation with its own indicator variables (.68 for General Health, .84 for Lifestyle Factors and .72 for Environment).

Meanwhile, although some indicator variables showed high standardised regression weights in explaining Health Profile (.86 for Exercise, .85 for Health Responsibility and .80 for Stress Management), the other variables such as Self-actualisation and Nutrition were not statistically significant in explaining Health Profile in this model.

Figure 4.2, in addition, displayed the correlation weights between the three latent variables. Double-headed arrows between Health Risk Perception, Health Profile and Psychological Factor demonstrated significant correlations with one another: .53 between Health Risk Perception and the Psychological Factor, -.70 between the Psychological Factor and
4.8. Summary

Data from 416 Korean high school students in Seoul, Korea and in Sydney, Australia were analysed to test the six research questions.

Table 4.16
A Summary of Results

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1&gt; How did adolescents perceive their own health risks and compare their own</td>
<td>Adolescents tended to have unrealistic perceptions about their vulnerability to the overall health risk events. Further, they tended to perceive their likelihood of health risks as lower than risks faced by their peers.</td>
</tr>
<tr>
<td>likelihood of health risks with that of other people in the same age group?</td>
<td></td>
</tr>
<tr>
<td>Q2&gt; Was there a difference in health risk perception of adolescents across gender</td>
<td>Female adolescents tended to perceive their health risks as lower than those of other people in their age, compared with males. Cultural differences existed in optimistic bias with that adolescents in Seoul perceived their likelihood of most of the health risks as lower than that of the Sydney adolescents.</td>
</tr>
<tr>
<td>and cultural settings?</td>
<td></td>
</tr>
<tr>
<td>Research Questions</td>
<td>Results</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Q3&gt; Were there differences in health profile across gender and cultural settings?</td>
<td>Differences in health profile items were not revealed between male and female adolescents. Cultural differences existed in the health profile dimensions in that adolescents in Seoul reported high scores on some items of Self-actualisation and adolescents in Sydney responded with higher scores on the health related items of Health Responsibility and Exercise.</td>
</tr>
<tr>
<td>Q4&gt; Were there differences in psychological variables across gender and cultural differences?</td>
<td>Differences in the psychological variables were revealed between gender and the different cultural settings. Male adolescents reported higher scores on internal health locus of control and self-esteem than females reporting with high scores on powerful other health locus of control. Cultural differences also exist in some of psychological variables. Adolescents in Seoul rated high scores on internal health locus of control, while the Sydney adolescents revealed high scores on self-efficacy and self-esteem.</td>
</tr>
<tr>
<td>Q5&gt; Is there a relationship of the psychological variables with the domains in health risk perceptions and health profiles?</td>
<td>The psychological variables made a significant contribution to the domains in health risk perception and health profile.</td>
</tr>
<tr>
<td>Q6&gt; What is the relationship between health risk perception, health profile and psychological factor?</td>
<td>Health risk perception, health profile and psychological factor were all significantly correlated with one another.</td>
</tr>
</tbody>
</table>
CHAPTER V

SUMMARY, CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

The proposed models for this study provided various significant results concerning health risk perception and health profile that in turn could lead to health or health breakdown in adolescence. The models also identified the possible psychological factors that could influence health risk perception and health profile of adolescents.

The application of these proposed models to the present study resulted in the acquisition of information about the factors contributing to perception and behaviour of adolescents influencing their health. Although the practical interventions such as health education, health promotion treatment are not explored in the present study, information obtained can assist in the planning and development of strategies for improving adolescent health status.
5.1. Summary

In order to obtain information about perception and behaviour influencing adolescent health and to identify the factors contributing to health risk perception and health profile of adolescents, this study examined the difference in health risk perception, health profile and the selected psychological variables of adolescents by gender and in two different cultural settings and identified a possible relationship between health risk perception, health profile and psychological factor with a view to providing information which may better assist the development of health promotion programs in each setting.

More specifically, this study examined perception and perception bias of adolescents to health risks; it compared the differences in perception and perception bias between male and female adolescents and between adolescents in Seoul and Sydney; investigated the differences in health profile of adolescents between gender and between the different cultural setting; and, investigated the differences in the selected psychological variables of adolescents across gender and cultural differences. The study, concomitantly, was undertaken to identify the possible relationships of psychological variables with the domains in health risk perception and health profile and a possible relationship between health risk perception, health profile and the psychological factor.
5.2. Conclusions

On the basis of analysis of the available data the following conclusions were made:

1. Adolescents tended to have unrealistic perceptions about their vulnerability to the overall health risk items and perceive their likelihood of health risks as lower than that of others in the same age.
2. Female adolescents tended to perceive their own chances of health risks as lower than those of other people in their age, compared with male adolescents.
3. Adolescents in Seoul have higher optimistic bias in most of the health risk items than those in Sydney.
4. The mean differences in health profile were not revealed between male and female adolescents.
5. Adolescents in Seoul reported high scores on some items of Self-actualisation and adolescents in Sydney responded with higher scores on the health related items of Health Responsibility and Exercise.
6. Male adolescents earned high scores on Internal Health Locus of Control and Self-esteem and females reported high scores on Powerful Other Health Locus of Control.
7. The Seoul adolescents responded with high scores on Internal Health Locus of Control and the Sydney adolescents rated high scores on self-efficacy and self-esteem.
8. Psychological variables made a significant contribution to the domains in health risk perception and the dimensions in health profile.

9. Health risk perception, health profile and psychological factor were all significantly correlated with one another.

5.3. Discussion

The significance of this study lies in the fact that it made a unique contribution to the existing knowledge about Korean adolescents. This knowledge could be, indeed should be, used to build more effective health education and health promotion activities. Its strength was in the sample which allowed data to be explored on a hitherto relatively unstudied group.

Adolescent health in Korea is not a prime focus for educators, health workers, government bureaucrats or politicians. Indeed, as explained earlier, health education as an aspect of primary health promotion is in its infancy, and only just emerging as a social educational issue. The point has been made that, even in societies like the United States and Australia where health education has been accepted as a discipline with an important social contributing role, adolescent health has been undervalued and neglected. Against this background, there has been very limited research into adolescent health in Korea.
This study provides much needed information about Korean adolescents in terms of their health behaviour and aspects of psychological constructs which relate directly to health behaviour. It provides knowledge about Korean adolescents which can be viewed in the light of related information available in the adolescent and health behaviour literature in the U.S. and Australia.

The other important aspect of the study involved looking at psychological constructs that have been identified as being related to health risk perception and health behaviour. It further explored the relationship of these constructs to health risk perception, optimistic bias and health behaviour, all of which are foci of this project.

Like their western peers, Korean adolescents tended to have an unrealistic perception regarding a variety of health risks. They believed that their own chances of experiencing health risks would be less than the chances of other people in the same age group.

The results of this research agree with previous studies (Weinstein, 1982; Moore & Rosenthal, 1992; Hoorens & Buunk, 1993). Weinstein (1982) noted that American students reported their own chances to be higher than zero for the positive health events and lower than zero for the negative events. Hoorens and Buunk (1993) also indicated that high school students in U.S. generally judged themselves as less
vulnerable than others to risks such as heart attack, suicide, AIDS and alcohol. Moore and Rosenthal (1992) pointed out that Australian adolescents underestimated their likelihood of health risk events as lower when compared to other people of the same age.

For the majority of risks Korean adolescents exhibited optimistic bias. The events for which they exhibited negative bias could be considered non-life threatening, generally not serious and probably unavoidable because of their endemic nature. The events for which they exhibited optimistic bias were generally major health events and, to a certain extent, individually avoidable.

Interestingly, results indicated that Korean adolescents perceived themselves as being vulnerable (i.e., more likely than their peers to experience the health risks) only to certain events (i.e., tooth decay, influenza and air pollution). Moore and Rosenthal's (1992) study indicated that Australian adolescents tended to have realistic perceptions if some health-related risks were judged as relatively not serious for their health or future life, or are already widespread in their life. It could be argued that the same explanation applies in this case.

Besides a general exhibition of optimistic bias there were gender and cultural differences within the sample. Female adolescents exhibited greater optimistic bias than their male counterparts. Specifically, female adolescents estimated their
chances of health risks such as smoking, alcohol and drink-driving as lower than those of males. In addition, females perceived their chances as significantly lower than those of males in the same age group at selected health risks such as AIDS, heart attack, smoking, drugs, chemicals in food, diabetes and obesity. Results support the previous study by Smith and Rosenthal (1995), which reported that female adolescents in Australia estimated their likelihood of health risks as lower than that of males, and that females believed their chances of health risks as significantly lower than those of their peers.

It is well known that adult women use health services more than men and this may have its beginning in the adolescent period. Given this level of interest in health, and willingness to address the issues through the use of health services, it may be reasonable to suggest female adolescents have every reason to be optimistic. Given, also, they may have knowledge that drink driving problems, AIDS, heart attack and smoking have higher prevalence rates in adult males, adolescent females again may have reason to be optimistically biased. Smith and Rosenthal (1995) suggested that this phenomena may occur as adolescence may be the key developmental period where females start to report increased interest in health issues and utilise the medical care system or counselling services to a greater extent than male adolescents.

Cultural differences with regard to optimistic bias were clearly apparent. Generally speaking, the adolescents in Seoul were
more optimistically biased than their counterparts in Sydney. Cultural differences in health related issues such as beliefs, behaviours and problems have been well established, so a finding of this nature is not surprising.

The Seoul adolescents reported themselves as being vulnerable to air pollution and acid rain. Perceptions of adolescents in Seoul to these specific health risks may be associated with current environmental issues in Korea and as a result, the Seoul adolescents may be tending to judge their environment as being risky for their health status.

Optimistic bias is a complex construct with its bases in psychology, belief systems and value structure. Clearly, values or people's value systems are elusive and intangible elements in a culture, but nevertheless exert a potent and enduring influence on their way of living, including behaviour and perception on health. Like their peers in the U.S. and Australia, Korean adolescents clearly showed optimistic bias in their risk perceptions. Adolescents, in general, perceived their chances of health risks as significantly low, when compared with their peers in the same age.

Knowledge of the presence of optimistic bias provides a clue to examine and influence people's response to health related behaviour and perception with a view to the acceptance of new practices or policies in health related interventions (Airhihenbuwa, 1995). As such this study has provided
important information for the process of adolescent health education in Korea.

Using an accepted instrument the health profile of Korean adolescents was investigated. The instrument contained six subscales which were composed of individual items related aspects of health behaviour and health beliefs. On each of the six subscales, no differences were revealed between males and females. There were significant differences on individual items which were of interest. Males reported being involved in meaningful personal relations more often than females; males were more positive about their future; but females indicated a high level behavioural involvement in expressing their feelings. The latter was of no surprise as the literature is complete with notation regarding female ability to express their feelings. Indeed, this makes the finding of males being involved in meaningful relationships all the more interesting. This could not be substantiated from literature and thus, there is a need for further investigation to see whether it is an aspect of Korean culture and is related to the peer group or the family.

Generally speaking, the results concerning health profile were at odds with previous research. Ratner, Bottorff, Johnson and Hayduk (1994) indicated that male adolescents in the U.S. reported higher scores on the Exercise dimension than females, while females responded with high scores on the Self-actualisation dimension.
In this study, females scored higher than males on the Exercise dimension although the difference in scores was not significant. Conversely, males reported higher scores on the Self-actualisation dimension; again however, the difference was not significant.

On each of the six subscales in the Health Profile, differences existed between adolescents in the two different cultural settings. Adolescents in Seoul reported higher scores on the Self-actualisation dimension, while the Sydney adolescents responded with higher scores on the Health Related dimensions (i.e., Health Responsibility and Exercise).

Results concerning cultural differences may be interpreted as a social phenomenon as well as a psychological phenomenon and can be frequently observed where peoples' behaviour related to health may reflect social values.

Another possible explanation of these results is that in a social and institutional view, adolescents in Sydney may seek access to health-related information and access their health condition in a school and community level. In contrast, due to the social and environmental limitations such as dominance of academic-centred social values, a lack of useful facilities for health-related activities, especially for adolescents, the chances of Korean adolescents in Seoul participating in the various health-enhancing activities are limited.
The Health Promoting Lifestyle Profile, in essence, provided a view which expressed health behaviour and beliefs. Health behaviour and beliefs are strongly positioned in psychological constructs as, of course, in the construct of risk, and as a flow on, optimistic bias.

Psychological variables were identified from the literature as being important to health behaviour and these were foci of the study. Locus of Control, which was differentiated into three specific aspects of this construct, Self-efficacy and Self-esteem were the variables of interest.

With regard to gender, neither males or females exhibited high scores on chance health locus of control and there was no difference between the two groups. It was noteworthy that both groups had elements of belief that health behaviour was not an outcome of randomness or chance. Either they themselves or, in relationship with others, had some control over their health. Indeed both groups scored highly on internal locus of control and interestingly, both groups also scored in the mid range on self-efficacy.

This may well be interpreted as suggesting they believed they were the most important in terms of controlling or determining their health but did feel they were not particularly efficacious in doing so. If accepted, this interpretation would provide a basis for program focus and content, involving the
development of skills, knowledge and beliefs related to self-efficacy.

Both groups scored highly on internal locus of control and self-esteem and males reported higher scores than females on both variables. Given male dominance in Korean culture, the result for the self-esteem is not surprising. However, research in the United States provided similar results. Nada-Raja, McGee and Williams (1994) indicated that male students in U.S. had stronger beliefs in internal locus of control. Rivas and Fernandez (1995) reported that male adolescents in the United States showed higher scores on self-esteem when compared to females.

On the variable 'powerful other locus of control' females scored significantly higher than males. Given the previous difference that existed between males and females on internal locus of control, this result is acceptable by way of interpretation. Male adolescents tended to believe that their health depended upon their own beliefs or behaviour, while female adolescents tended to perceive their health was determined by significant others.

Previous studies cited in the literature (Ricco-Howe, 1991; Maron, Telch & Killen, 19896) support the notion of powerful others being an important influence in health behaviour, particularly, in the case of females (Ricco-Howe, 1991). Again, the result is consistent with Korean culture where parents are
dominant, particularly in the lives of adolescent females. Therefore, this information should guide health education program developers.

In addition, adolescents in Seoul had higher scores on Internal Health Locus of Control than those in Sydney, however, for Self-efficacy and Self-esteem the Sydney adolescents reported significantly higher scores than their counterparts in Seoul. For the different cultural settings, the results pointed out that adolescents in Sydney have higher self-reliability and life satisfaction than the Seoul adolescents. This result may be interpreted to suggest individuals' psychological aspects can depend upon social values and the physical environment of a society and such societal nature can play a key role to form individuals' positive psychological consequences.

When the psychological variables were examined across culture, a surprising result emerged with adolescents in Seoul scoring higher on the Internal Locus of Control Scale than their Sydney peers. Not so surprising was the opposite result for Self-efficacy and Self-esteem. That cultural differences existed was expected and had been supported from previous studies (Weizel and colleagues, 1994). It could be argued that a freer, less family dominated society like Sydney facilitates development of self-esteem and self-efficacy in general. Korean adolescents in Sydney have more choices, more freedom and therefore, it could be argued, more opportunities to gain confidence which relate to self-esteem and self-efficacy.
Having explored differences or otherwise in identified variables and culture the study then sought to add to the general health literature by exploring the relationship between the variables in the study. Given the strong psychological underpinning of risk perception and the involvement of psychological variables in determining health profiles, it was not unexpected that the constructed psychological factor correlated highly and significantly with them or the subscales/dimensions embedded in them. The result was reinforced by evidence presented in the literature chapter, and in practical terms reinforced the argument for consideration of psychological aspects in the development of health education programs.

These identified correlations allowed for further exploration of possible relationship between health risk perception, health profile and the constructed psychological factor. Clearly, the regression analysis model and factor analysis model were an adequate fit to identify possible relationships which were expressed numerically in terms of correlations and equally clearly the relationships between health risk perception, health profile and the psychological factor were significant and strong. Such findings of the existence of broad relationships suggest understanding could be increased if further studies were to be undertaken to look at relationships between specific dimensions of the broader domains.
Limited research already exists in the area. Hooren and Buunk (1994), for example, have already noted that the American students with external locus of control reported more optimistic bias over specific health risks. Bottorff and colleagues (1996), more recently, reported that health locus of control and self-efficacy contributed to explain the sub dimensions in health profile of adolescents.

On the basis of these findings, this study provides significant information, specifically information not previously obtained for a cultural effect in health risk perception, health profile and psychological factor related to adolescents. For Korea, this study has the potential to influence the development of better health education and promotion programs for health issues of adolescents, identified by this study, at the school and community level. In addition, this study provides useful information for the health related sectors in Australia to ensure the needs of adolescents of Korean background are addressed. Further, it adds to the body of knowledge related to adolescent health in general.
5.4. Recommendations

On the basis of results achieved in this study, there are a number of recommendations arising out of this research. These recommendations relate to various aspects of the findings and are listed below.

1. A further study should be considered using more sophisticated techniques to measure health risk perception and health profile of Korean adolescents.

2. Future research on these populations should focus on specific health areas for in-depth study such as mental health of adolescents, AIDS prevention and pregnancy prevention for adolescents.

3. It is important to adequately prepare, better equip and encourage health workers to deal with the physical, psychological and social needs of adolescents of different ethnic backgrounds. Further study should focus on developing strategies for achieving effective education and support programs.

4. The results should be used to estimate effect for the calculation of sample sizes required in any future research. The findings of this study should be applied when providing better and more effective health services, health promotion activities and health education for youth.

This research was undertaken to investigate health risk perception and health profile of Korean adolescents, attending
schools in Seoul, Korea and Sydney, Australia. Ideas and issues identified through this study are in line with the results of previous research in the adolescent health field. Some questions have been answered, and underlying premises have been confirmed. There are, however, some questions, the answers to which raise additional issues that require further elaboration and investigation. The issues raised throughout this study, therefore, could be used to give direction for the development of adolescent health programs, for Koreans, and for direction of further studies in adolescent health.
APPENDIX A

VALIDATION COMMITTEES
The following persons were members of the panel that provided validation for the instruments.

**Brin Grenyer, Ph.D.**
Lecturer  
Faculty of Nursing  
University of Wollongong  
Wollongong, NSW, Australia

**Patrick Heaven, Ph.D.**
Senior Lecturer  
Department of Psychology  
University of Wollongong  
Wollongong, NSW, Australia

**Yvonne Kerr, M.Ed.**
Senior Lecturer  
Faculty of Education  
University of Wollongong  
Wollongong, NSW, Australia

**Roslyn Westbrook, M.Ed.**
Lecturer  
Faculty of Education  
University of Wollongong  
Wollongong, NSW, Australia
Chang-Kyu Kim, Ph.D.
Professor
Faculty of Education
KookMin University
Seoul, Korea

Gui-Bong Kim, Ph.D.
Professor
Faculty of Education
KookMin University
Seoul, Korea

Ki-Woong Kim, Ph.D.
Associate Professor
College of Physical Education
Ewha Women’s University
Seoul, Korea

Bong-Ju Seong, M.Ed.
Head teacher (Physical Education)
ChangDong Junior High School
Seoul, Korea

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APPENDIX B

PERMISSIONS
Dear Young,

I am pleased to advise that the following Human Research Ethics application has been conditionally approved:

Ethics Number: HE96/187
Project Title: Adolescents' Perceptions on Health Risk, Health Promoting Behaviours and their Relationship with the Selected Psychological Variables Across Gender and Nationality.
Name of Researchers: Young Ho Kim
Approval Date: 3 September 1996
Duration of Clearance: 2 September 1997

This approval is granted subject to satisfactory clarification of the following matters:

(i) that written approval to conduct the research is obtained from the Department of Education and forwarded to the Committee (Note: There are new Guidelines released by the Department of Education which need to be consulted. Copies are available from Jan James, Faculty of Education)

Please provide written evidence that these conditions have been satisfied to the Secretary of the Committee before the commencement of your research, or approval will be withdrawn.
This certificate relates to the research protocol submitted in your application of 21 August 1996. It will be necessary to inform the Committee of any changes to the research protocol and seek clearance in such an event.

Please note that experiments of long duration must be reviewed annually by the Committee and it will be necessary for you to apply for renewal of this application if experimentation is to continue beyond one year.

Professor G.D. Calvert
Chairperson
Human Research Ethics Committee

cc: A/P J. Patterson, Supervisor
Dear students,

I am a PhD student in the Faculty of Education at the University of Wollongong. The title of my thesis is "Adolescents' Perceptions with regard to Health Risks, Health Profile and the Relationship of These Variables to Psychological Factor - A Study across Gender and the Different Cultural Settings "

I am very interested in the health and well-being of the young people. This is why my study is aimed at establishing the specific health attitudes and perceptions of the young people as they themselves identify them.

I am conducting research which will investigate students' personal risk perceptions regarding health and health-related attitudes and behaviours. There are various ways of assessing these attitudes, but this study will use a series of questionnaires to assess the selected variables relating to adolescent health.

In the next few weeks I am planning to carry out a survey of students like yourself to obtain information that will help to develop health education programs and better health services for you.

In order to complete this study I am seeking your assistance in completing the questionnaire. There will be no names written on the questionnaires and no individual student will be identified so that complete privacy and anonymity can be maintained. Participation in the survey is entirely voluntary and you may choose to take part or not take part as you see fit.

I thank you in anticipation of your support for this study.

Yours sincerely,

YOUNGHO KIM
CONSENT FORM

Adolescents' Perceptions with regard to Health Risks, Health Profile and the Relationship of These Variables to Psychological Factor - A Study across Gender and the Different Cultural Settings

YOUNGHO KIM

I understand

- what the proposed study involves;
- that approval to conduct the research has been received from the school;
- complaints may be directed to the Secretary of the University of Wollongong Human Experimentation Ethics Committee on (042) 214457;

and give my permission as parent/guardian for my son/daughter to participate

(Signature of parent/guardian)

I understand what my participation in the study involves that the data collected will be used for analysis by Mr. YoungHo Kim and for no other reason. I understand that all information gathered is confidential and anonymous. I am also aware that I can withdraw from the study at any time, and I consent for the data to be used in that manner.

(Signature of student)
Dear principal,

I am a PhD student in the Faculty of Education at the University of Wollongong. The title of my thesis is "Adolescents' Perceptions with regard to Health Risks, Health Profile and the Relationship of These Variables to Psychological Factor - A Study across Gender and the Different Cultural Settings". Your assistance in this study would be greatly appreciated.

I am conducting research which will investigate students' personal risk perceptions regarding health and health-related attitudes and behaviours. There are various ways of assessing these attitudes, but this study will use a series of questionnaires to assess the selected variables relating to adolescent health.

There will be no names written on the questionnaires and no individual student will be identified so that complete privacy and anonymity can be maintained. Participation in the survey is entirely voluntary and students may choose to take part or not take part as they see fit.

Please find attached a copy of the approval letter from the University of Wollongong Human Experimentation Ethics Committees, study outline and questionnaires. If you have any further queries, I would be only too happy to meet with you and discuss them.

I would be very grateful if you will allow your students the opportunity to participate in this study and I thank you in anticipation of your support for this research.

Yours Sincerely,

YoungHo Kim
APPENDIX C

DESCRIPTION OF AMOS
The Analysis of Moment Structure [AMOS] 3.6 version was developed by Arbuckle (1996). According to Arbuckle (1997), AMOS implemented the general approach to data analysis known as analysis of covariance structure, analysis of linear structure relations, structural equation modelling or causal modelling. This approach includes as special cases many well known conventional techniques, including the general linear model and common factor analysis.

AMOS was originally designed as a tool for teaching this powerful and fundamentally simple method. For this reason, every effort was made to see that it is easy to use. Ever complex structural equation models are specified and evaluated graphically, as path diagrams. Several intelligent drawing aids are built into the program to make graphical modelling easy. In detail, AMOS accepts a path diagram as a model specification, and displays parameter estimates graphically on a path diagram. The path diagrams used for model specification, as well as those that display parameter estimates, are of presentation processors, desktop publishing programs and general purpose graphics programs (SPSS Inc., 1997).

In addition, AMOS can build models that more accurately reflect complex relationships because any variables, observed or latent, can predict any other variable. AMOS, again, offers richer and more comprehensive model which can combine factor and
regression models into one and hence several procedures such as running factor analysis, saving the factor scores for input into regression and running regression can be omitted by this program. By fitting of multiple models in a single analysis, AMOS examines every pair of models in which one model can be obtained by placing restrictions on the parameters of the other. The program reports several statistics appropriate for comparing models for different groups. It can estimate mean and intercept terms in the one path diagram (Smallwaters Inc., 1997).

Arbuckle (1997) indicated that AMOS provides the following methods for estimating structural equation models: maximum likelihood; unweighted least squares; generalised least squares; Browne's asymptotically distribution-free criterion; and, scale-free least squares. It, further, provides a variety of fit statistics such as Chi-square, Akiake, Bayes and Bozdogan information criteria, Browne and Cudeck criteria, root mean square error of approximation [RMSEA]; Hoetler's critical \( n \); Bentler-Bonnet and Tucker-Lewis indices; root mean square residual [RMR]; goodness-fit-index [GFI]; and, adjusted goodness-fit-index [AGFI].
APPENDIX D

INSTRUMENTS
SEX: M ( ) F ( ) AGE:

COMPARATIVE RISK RATING PROFILE

[1] Self-rating scale

In this questionnaire we are interested in knowing what you think YOUR chances are of suffering from health problems and related illness during your lifetime. We will provide you with examples of health problems or examples of negative health behaviours and ask you "how likely do you think you are to suffer from/or engage in them". You will be asked to respond on a 5 point scale from -2 to +2. The scale is as follows.

• -2 I am VERY UNLIKELY to suffer from health problems or engage in health related behaviours.
• -1 I am UNLIKELY to suffer from health problems or engage in health related behaviours.
• 0 POSSIBLY I am to suffer from health problems or engage in health related behaviours.
• +1 I am LIKELY to suffer from health problems or engage in health related behaviours.
• +2 I am VERY LIKELY to suffer from health problems or engage in health related behaviours.

<EXAMPLE>
In course of your lifetime how likely are you to fall off a ladder?

Very unlikely unlikely possibly likely very likely
-2 -1 0 +1 +2

In your lifetime how likely are you to suffer from

1. AIDS

-2 -1 0 +1 +2

2. heart attack

-2 -1 0 +1 +2

3. cancer

-2 -1 0 +1 +2

216
4. diabetes

<table>
<thead>
<tr>
<th></th>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Possibly</th>
<th>Likely</th>
<th>Very likely</th>
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<tr>
<td></td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
</tr>
</tbody>
</table>

5. broken bones

|                | -2 | -1  | 0    | +1    | +2          |

6. flu

|                | -2 | -1  | 0    | +1    | +2          |

7. serious car injury

|                | -2 | -1  | 0    | +1    | +2          |

8. tooth decay

|                | -2 | -1  | 0    | +1    | +2          |

In your lifetime how likely are you to regularly engage in the following health related behaviours or suffer from the following health related problems?

9. smoke cigarettes

|                | -2 | -1  | 0    | +1    | +2          |

10. take illegal drugs

|                | -2 | -1  | 0    | +1    | +2          |

11. drinking too much alcohol

|                | -2 | -1  | 0    | +1    | +2          |

12. exercise too little

|                | -2 | -1  | 0    | +1    | +2          |
13. eat unhealthy foods

<table>
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<th>Very unlikely</th>
<th>Unlikely</th>
<th>Possibly</th>
<th>Likely</th>
<th>Very likely</th>
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<tbody>
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<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
</tr>
</tbody>
</table>

14. suffer from too much stress

|                      | -2            | -1       | 0        | +1     | +2          |

15. drive while over the alcohol limit

|                      | -2            | -1       | 0        | +1     | +2          |

16. attempt suicide

|                      | -2            | -1       | 0        | +1     | +2          |

17. suffer from obesity

|                      | -2            | -1       | 0        | +1     | +2          |

In your lifetime how likely are you to

18. be a homicide victim

|                      | -2            | -1       | 0        | +1     | +2          |

19. get caught in a fire

|                      | -2            | -1       | 0        | +1     | +2          |

20. be exposed to toxic waste

|                      | -2            | -1       | 0        | +1     | +2          |

21. suffer illness from chemicals in food

|                      | -2            | -1       | 0        | +1     | +2          |

22. be exposed to acid rain

|                      | -2            | -1       | 0        | +1     | +2          |
23. suffer the effects of air pollution

-2  -1  0  +1  +2

24. get caught in an earthquake

-2  -1  0  +1  +2

[2] Other-rating scale

In this questionnaire we are interested in knowing what you think chances of OTHER PEOPLE in your age are of suffering from health problems and related illness during their lifetime.

We will provide you with examples of health problems or examples of negative health behaviours and ask you “how likely do you think other people in your age are to suffer from/or engage in them”.

You will be asked to respond on a 5 point scale from -2 to +2. The scale is as follows.

-2 Other people in your age are VERY UNLIKELY to suffer from health problems or engage in health related behaviours.

-1 Other people are UNLIKELY to suffer from health problems or engage in health related behaviours.

0 POSSIBLY other people are to suffer from health problems or engage in health related behaviours.

+1 Other people are LIKELY to suffer from health problems or engage in health related behaviours.

+2 Other people are VERY LIKELY to suffer from health problems or engage in health related behaviours.

<EXAMPLE>

In lifetime of other people in your age how likely are they to fall off a ladder?

Very unlikely Unlikely Possibly Likely Very likely

-2  -1  0  +1  +2

In lifetime of other people in your age how likely are they to suffer from

1. AIDS

-2  -1  0  +1  +2
<table>
<thead>
<tr>
<th></th>
<th>heart attack</th>
<th>3. cancer</th>
<th>4. diabetes</th>
<th>5. broken bones</th>
<th>6. flu</th>
<th>7. serious car injury</th>
<th>8. tooth decay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very unlikely</td>
<td>Unlikely</td>
<td>Possibly</td>
<td>Likely</td>
<td>Unlikely</td>
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<td>+1</td>
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<td>+1</td>
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</tbody>
</table>

In lifetime of other people in your age how likely are they to regularly engage in the following health related behaviours or suffer from the following health related problems?

9. smoke cigarettes

<table>
<thead>
<tr>
<th></th>
<th>9. smoke cigarettes</th>
<th>10. take illegal drugs</th>
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<tbody>
<tr>
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<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>-2</td>
<td>-1</td>
<td>0</td>
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</tbody>
</table>

220
11. drinking too much alcohol

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Possibly</th>
<th>Likely</th>
<th>Very likely</th>
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<td>-2</td>
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<td>0</td>
<td>+1</td>
<td>+2</td>
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</tbody>
</table>

12. exercise too little

| -2 | -1 | 0 | +1 | +2 |

13. eat unhealthy foods

| -2 | -1 | 0 | +1 | +2 |

14. suffer from too much stress

| -2 | -1 | 0 | +1 | +2 |

15. drive while over the alcohol limit

| -2 | -1 | 0 | +1 | +2 |

16. attempt suicide

| -2 | -1 | 0 | +1 | +2 |

17. suffer from obesity

| -2 | -1 | 0 | +1 | +2 |

18. be a homicide victim

| -2 | -1 | 0 | +1 | +2 |

19. get caught in a fire

| -2 | -1 | 0 | +1 | +2 |

20. be exposed to toxic waste

| -2 | -1 | 0 | +1 | +2 |
21. suffer illness from chemicals in food

<table>
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<tr>
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<th>Unlikely</th>
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<tr>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
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</table>

22. be exposed to acid rain

<table>
<thead>
<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
<th>Possibly</th>
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<th>Unlikely</th>
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<td>-2</td>
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</table>

23. suffer the effects of air pollution

<table>
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<tr>
<th>Very unlikely</th>
<th>Unlikely</th>
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<td>-2</td>
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24. get caught in an earthquake

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<th>Very unlikely</th>
<th>Unlikely</th>
<th>Possibly</th>
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<th>Unlikely</th>
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**HEALTH PROMOTING LIFESTYLE PROFILE**

In this set of questions we are interested in knowing more about your health actions and behaviours. We will ask you questions on these matters and get you to respond on a 4 point scale. The points are as follows.

- 1 Never
- 2 Sometimes
- 3 Often
- 4 Routinely

<EXAMPLE>

How often do you feel sad?

<table>
<thead>
<tr>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Routinely</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</table>

How often do you

1. feel enthusiastic/optimistic?

<table>
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<tr>
<th>1</th>
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<th>3</th>
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2. like yourself?

<table>
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<th>1</th>
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3. feel growing/changing?

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<th>1</th>
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4. think about long-term goals?

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5. feel happy/content?

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<th>4</th>
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6. feel strength/weakness?

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7. think positively your future?

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8. set realistic goals?

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How often do you

9. think about what is important?

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<th>Never</th>
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<th>Often</th>
<th>Routinely</th>
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</table>

10. respect the things that you accomplish?

| 1 | 2 | 3 | 4 |

11. find days challenging?

| 1 | 2 | 3 | 4 |

12. think life has purpose?

| 1 | 2 | 3 | 4 |

13. think the quality of your environment?

| 1 | 2 | 3 | 4 |

14. check your cholesterol level?

| 1 | 2 | 3 | 4 |

15. read books about health?

| 1 | 2 | 3 | 4 |

16. check blood pressure?

| 1 | 2 | 3 | 4 |

17. discuss health concerns with family and friends?

| 1 | 2 | 3 | 4 |

18. seek information about health?

| 1 | 2 | 3 | 4 |

19. attend health-related program at school?

| 1 | 2 | 3 | 4 |

20. have medical check-up?

| 1 | 2 | 3 | 4 |

224
### How often do you

21. observe body for changes?

<table>
<thead>
<tr>
<th></th>
<th>Never</th>
<th>Sometimes</th>
<th>Often</th>
<th>Routinely</th>
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22. do vigorous exercise (3 times a week)?

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23. attend supervised exercise programs?

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24. check pulse rate?

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25. eat breakfast?

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</table>

26. eat 3 meals daily

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27. ensure you get plenty of roughage/fiber?

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28. ensure your food is low in preservatives?

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29. ensure you eat foods from the four food groups?

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30. discuss concerns or problems with significant others?

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31. say nice about others?

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</table>

32. think about maintain meaningful interpersonal relationship?

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</table>
How often do you

33. have time with close friends?

<table>
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<th>Never</th>
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<th>Often</th>
<th>Routinely</th>
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<td>4</td>
</tr>
</tbody>
</table>

34. express interest in/love for significant others?

1 2 3 4

35. enjoy touch or being touched?

1 2 3 4

36. consciously take time to relax?

1 2 3 4

37. think about stress sources?

1 2 3 4

38. consciously try and relax muscles before sleep?

1 2 3 4

39. have a good night sleep?

1 2 3 4

40. express feelings?

1 2 3 4

41. consciously try and control your stress?

1 2 3 4
**SELF-EFFICACY SCALE**

In this questionnaire we are interested in knowing more about how you handle life. We are providing you with 17 statements and you are to respond to the on large scale- it is 14 points long. An answer of 1 says you strongly disagree with the statement. An answer of 14 says you strongly agree with the statement. The closer to 1 the more you disagree. The closer to 14 the more you agree.

**<EXAMPLE>**

I am very good looking.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

1. When I make plans, I am certain I can make them work.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

2. One of my problems is that I can't get down to work when I should.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
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<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
</tbody>
</table>

3. If I can't do a job the first time, I keep trying until I can.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
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<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
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</table>

4. When I set important goals for myself, I rarely achieve them.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
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</tbody>
</table>

5. I give up on things before completing them.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
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<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
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<tr>
<td>Strongly agree</td>
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</table>

6. I avoid facing difficulties.

<table>
<thead>
<tr>
<th>Strongly disagree</th>
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</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13</td>
</tr>
<tr>
<td>Strongly agree</td>
</tr>
</tbody>
</table>
7. If something looks too complicated, I won't even bother to try it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly disagree

8. When I have something unpleasant to do, I stick to it until I finish it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

9. When I decide to do something, I go right to work on it.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

10. When trying to learn something new, I soon give up if I can not initially successful.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

11. When unexpected problems occur, I don't handle them well.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

12. I avoid trying to learn new things when they look too difficult for me.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

13. Failure just makes me try harder.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

14. I feel insecure about my ability to do things.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

15. I am a self-reliant person.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

228
16. I give up easily.

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly disagree

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Strongly agree

17. I don't seem capable of dealing with most problems that come up in life.

1 2 3 4 5 6 7 8 9 10 11 12 13 14
This is an interesting questionnaire in which we are interested in how you see aspects of your own health. We are interested in how likely you think each of the following statements related to you.

The scale this time is a 6 point scale. At one end is “VERY UNLIKELY” which is given a 1. At the other end is “VERY LIKELY” which is given a 6. Your position on the scale statements what you think about that statement and the likelihood of it being true for you.

<EXAMPLE>
I am in control of the grades I get at school.

1  2  3  4  5  6
Very unlikely

If you circle 1 then you are saying someone else or some other forces control your high school results. If you circle 6 you are saying you are pretty much in control of your own grades.

1. If I get sick, it is my own behaviour which determines how soon I get well again.

1  2  3  4  5  6

2. No matter what I do, if I am going to get sick, I will get sick.

1  2  3  4  5  6

3. Having regular contact with my physician is the best way for me to avoid illness.

1  2  3  4  5  6

4. Most things that affect my health happen to me by accident.

1  2  3  4  5  6
5. Whenever I don't feel well, I should consult a medically trained professional.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
<tr>
<td>Very unlikely</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very likely</td>
</tr>
</tbody>
</table>

6. I am in control of my health.

| 1 | 2 | 3 | 4 | 5 | 6 |

7. My family has a lot to do with my becoming sick or staying healthy.

| 1 | 2 | 3 | 4 | 5 | 6 |

8. When I get sick I am to blame.

| 1 | 2 | 3 | 4 | 5 | 6 |

9. Luck plays a big part in determining how soon I will recover from an illness.

| 1 | 2 | 3 | 4 | 5 | 6 |

10. Health professionals control my health.

| 1 | 2 | 3 | 4 | 5 | 6 |

11. My health is largely a matter of luck.

| 1 | 2 | 3 | 4 | 5 | 6 |

12. The main thing which affects my health is what I myself do.

| 1 | 2 | 3 | 4 | 5 | 6 |

13. If I take care of myself, I can avoid illness.

| 1 | 2 | 3 | 4 | 5 | 6 |
14. When I recover from an illness, it's usually because other people (for example, doctors, nurses, family, and friends) have been taking good care of me.

1 2 3 4 5 6
Very unlikely

15. No matter what I do, I am likely to get sick.

1 2 3 4 5 6

16. If it's meant to be I will stay healthy.

1 2 3 4 5 6

17. If I take the right actions I can stay healthy.

1 2 3 4 5 6

18. Regarding my health I can only do what my doctor tells me to do.

1 2 3 4 5 6
SELF-ESTEEM SCALE

Again we want to know more about you. We will provide you with statements and we ask you to indicate whether you agree or disagree on a 4 point scale. An answer of 1 says you strongly disagree with the statements. An answer of 4 says you strongly agree with the statement. The closer to 1 the more you disagree and the closer to 6 the more you agree.

<EXAMPLE>
On the whole I think I am a sex symbol.

1 2 3 4
Strongly disagree Disagree Agree Strongly agree

1. On the whole I am satisfied with myself.

1 2 3 4

2. At times I think I am no good at all.

1 2 3 4

3. I feel that I have a number of good qualities.

1 2 3 4

4. I am able to do things as well as most other people.

1 2 3 4

5. I feel I do not have much to be proud of.

1 2 3 4

6. I certainly feel useless at times.

1 2 3 4
7. I feel that I am a person of worth, at least on an equal plan with others.

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<th>3</th>
<th>4</th>
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<tbody>
<tr>
<td></td>
<td>Strongly disagree</td>
<td>Disagree</td>
<td>Agree</td>
<td>Strongly agree</td>
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</table>

8. I wish I could have more respect for myself.

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9. All in all I am inclined to feel that I am a failure.

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10. I take a positive attitude toward myself.

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