

Determinants of Health-Promoting Lifestyles in Adolescent Females

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On a examiné la relation entre la salubrité du mode de vie et la définition de la santé, la perception de l'état de santé, l'efficacité personnelle, la salubrité du mode de vie du père et de la mère, et les données démographiques sélectionnées chez les adolescentes. L'étude comptait cent quatre-vingt-quatre adolescentes et leurs parents. Le cadre conceptuel de l'étude était donné par une modification du modèle de promotion de la santé de Pender (1982-1987). Deux questions tirées du modèle conceptuel guidèrent la recherche. Les résultats démontrèrent que la salubrité du mode de vie de la mère et du père établissait une corrélation significative avec la salubrité du mode de vie de leur fille. Il existait un lien certain entre les variables prédictives de la définition de la santé (sous-échelles cliniques, fonctionnelles et eudémonistes), l'efficacité personnelle, la perception de l'état de santé et l'ethnicité, et le critère de salubrité du mode de vie de l'adolescente. Ces différentes variables représentaient 41 % de variance dans les pointages de la salubrité du mode de vie des adolescentes. Les implications pour la recherche en sciences infirmières et sa pratique sont en discussion.

The relationship between health-promoting lifestyle and definition of health, perceived health status, self-efficacy, maternal and paternal health-promoting lifestyle, and selected demographics in adolescent females was investigated. Included in the study were 184 adolescents and their parents. A modification of Pender's (1982, 1987) Health Promotion Model provided the conceptual framework for the study. Two research questions evolving from the conceptual model guided the study. Results indicated that mothers' and fathers' health-promoting lifestyles were significantly correlated with their daughters' health-promoting lifestyles. A strong relationship existed between the predictor variables of definition of health (clinical, functional, and eudaimonistic subscales), self-efficacy, perceived health status, and ethnicity, and the criterion variable of adolescents' health-promoting lifestyles. Together these variables accounted for 41% of the variance in adolescent health-promoting lifestyle scores. Implications for nursing research and practice are discussed.

Although much is known about the prevention and treatment of disease in adolescents, little is known about how adolescents view their health, and the factors that relate to their lifestyle and health behaviour choices. The research on health-promoting behaviour of adolescents in general, and adolescent females in particular, is less extensive than that dealing with adult health behaviours (Alexander, 1989; Millstein, Petersen & Nightingale, 1993).

Given that 50% of all health care costs in this country are the result of lifestyle choices, and that the adolescent population is the only age group in which the morbidity and mortality rates have continued to increase over the past 20 years (Tyson, 1990; Vernon, 1991), it is extremely important to study the determinants of a health-promoting lifestyle in adolescents. This informa-

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tion is critical to improving the health status of adolescents because the contribution of preventable social, environmental, and behavioural lifestyle-related factors to mortality and morbidity is greater in adolescents than it is in children and adults (Rosen, Xiangdong & Blum, 1990).

An accumulating body of evidence suggests that adolescent girls are at special risk. Compared to their male counterparts, they show higher rates of morbidity as indicated by utilization of physician services and hospitalization; they also report more mental health concerns and are more often diagnosed with major mental depressive disorders (Millstein & Litt, 1990). Although nursing has recently addressed women's health and related behavioural issues, factors that contribute to the lifestyle patterns of adolescent females need to be examined.

A growing number of investigators have explored determinants of health-promoting lifestyles in adults and elderly people (Duffy, 1993; Kerr & Ritchey, 1990; Pender, Walker, Sechrist & Frank-Stromberg, 1990). Such studies suggest that cognitive-perceptual variables such as perceived health status, self-efficacy, definition of health, and modifying factors such as demographics and family variables positively influence engagement in a health-promoting lifestyle. The factors that relate to engagement in a health-promoting lifestyle in adolescents, and particularly adolescent females, are unknown. There is a paucity of studies exploring the role of cognitive health variables, family influences, and demographic factors in female adolescents' engagement in health-promoting lifestyles, and few of the studies have been framed conceptually within a health-promotion perspective. Therefore, the specific purposes of this study were: (a) to determine what relationships exist between health-promoting lifestyle in adolescent females and the cognitive-perceptual variables of perceived health status, definition of health, self-efficacy, maternal health-promoting lifestyle, paternal health-promoting lifestyle, and selected demographics; and (b) to determine which of these variables best predict a health-promoting lifestyle in adolescent females.

Literature Review

Due to the limited number of studies that address the determinants of a health-promoting lifestyle in adolescent females, a selection of studies from the adult literature is included in this review. Although a plethora of studies purport to measure health-promoting lifestyle in adolescents, most are limited to single health behaviours rather than a pattern of behaviour (Patterson & McCubbin, 1987; Riccio-Howe, 1991). Four studies were found that provide initial support for the concept of a health-promoting lifestyle in adolescents (Donovan, Jessor & Costa, 1991; Kulbok, Earls & Montgomery, 1988; Magelvy, 1987; Nutbeam, Aar & Catford, 1989). However, there

remains a need to explore the underlying structure and determinants of a health-promoting lifestyle in adolescents.

The concept of perceived health status has been examined in adolescents (Alexander, 1989; Mechanic & Cleary, 1980; Mechanic & Hansell, 1987), but no study has examined its relationship to health-promoting lifestyles in adolescent females. Pender (1987) noted that perceived health status is an important variable to consider in relation to a health-promoting lifestyle. Studies of adults have provided evidence that the better one perceives one's health to be, the greater the likelihood of engagement in a health-promoting lifestyle (Duffy, 1988, 1989; Frank-Stromberg, Pender, Walker & Sechrist, 1990; Killeen, 1989; Riffle, Yoho & Sams, 1989; Weitzel & Waller, 1990). These studies parallel the findings of Pender et al. (1990) who reported that a positive evaluation of health status was associated with a health-promoting lifestyle in a sample of 589 adult employees. In contrast, Laffrey (1986) reported that perceived health status and health behaviour choices were not related in a study of normal weight and overweight adults. Similarly, Harris and Guten (1979) in a sample of 842 randomly selected adults, found no difference in self-reported health behaviours, whether individuals reported themselves to be in good, fair, or poor health. Hence, the relationship between perceived health status and health-promoting lifestyle is not clear and warrants further study in both adolescents and adults.

Pender (1987) proposed that the definition of health to which individuals subscribe may influence the extent to which they engage in a health-promoting lifestyle. Several studies have examined the influence of definition of health on health behaviour in young children and adults (Altman & Revenson, 1985; Frank-Stromberg et al., 1990; Laffrey, 1986; Natapoff, 1978; Segall & Wynd, 1990), but no study has examined this variable in an exclusively female adolescent population. Most of the studies have grouped different age groups together, making it impossible to isolate the uniqueness of the adolescent perspective. In a sample of 175 adolescents, Barnett (1989) noted that definition of health was a significant predictor of engagement in a health-promoting lifestyle for middle adolescents but not for early or late adolescents.

Self-efficacy has emerged as a predictor of health-promoting lifestyles in adults (McAuley & Jacobson, 1991; Pender et al., 1990; Waller, Crow, Sands & Becker, 1988; Weitzel, 1989; Weitzel & Waller, 1990). Efficacy perceptions have been repeatedly correlated with positive health behaviours such as cessation of cigarette smoking or exercise initiation (Davis, Jackson, Kronenfeld & Blair, 1987; DiClemente, 1981). These studies have focused on adult populations, and more specifically, on those located in treatment and rehabilitation programs. The concept of self-efficacy in adolescents and its role in influencing participation in health-promoting lifestyles remain to be explored, as only one

study has examined this relationship. Barnett (1989) concluded from a study of 175 early, middle, and late adolescents that self-efficacy was the only cognitive-perceptual variable that consistently predicted health-promoting lifestyles.

The role of parents and family in shaping the adolescent experience is widely embraced by developmentalists, and has become an increasingly important focus of study to understand the sources of unhealthy behaviour (Millar, 1991; Proia, Hester & Connor, 1987; Turner, Irwin & Millstein, 1991). However, few empirical investigations have focused on the role of parental lifestyle in influencing positive behaviours in their adolescents. The majority of studies in this area have focused on younger preschool and school-age children (Cohen, Felix & Brownell, 1989; Dielman, Leech, Becker & Horvath, 1984). Only two studies in the literature explored the relationship between adolescent health behaviours and parental modelling of health behaviour (Riccio-Howe, 1991; Donovan, Jessor & Costa, 1991). They concluded that greater modelling of health-enhancing behaviours by parents was associated with higher levels of involvement in health-related behaviours in adolescents. Further research on this subject is warranted.

Conceptual Framework

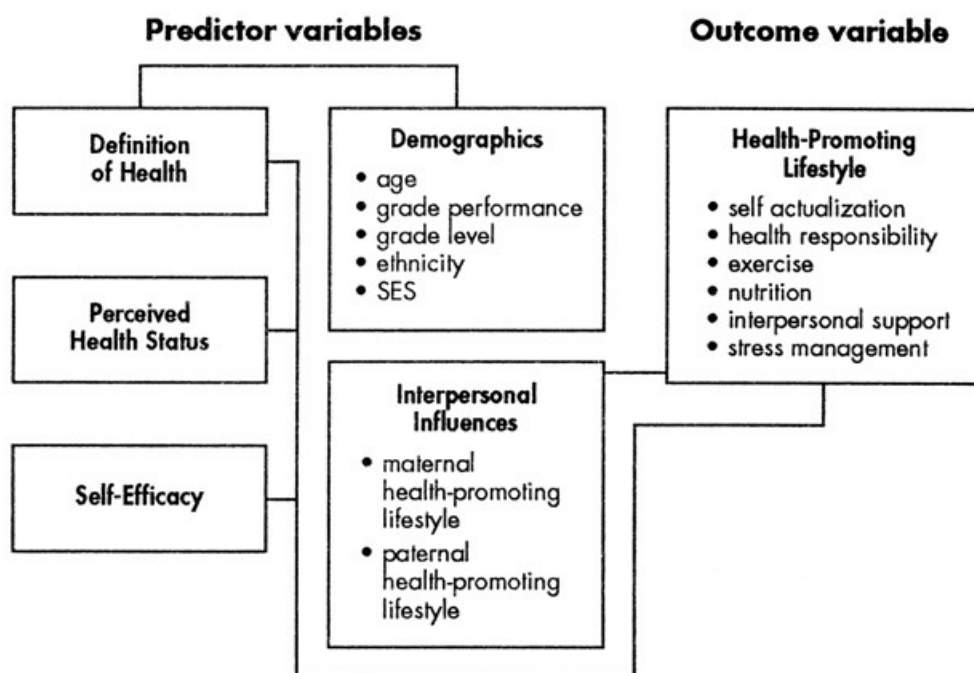
A modification of Pender's Health Promotion Model (Pender, 1982, 1987) provided the framework for this study. An exploratory paradigm of the relationships examined in this investigation is presented in Figure 1, and is intended as a correlational model, not a hypotheses-testing model. Although Pender's model has been tested with a range of adult populations (e.g., Duffy, 1993; Pender et al., 1990; Stuijbergen, Becker & Sands, 1990; Weitzel & Waller, 1990), it is this author's opinion that there is insufficient empirical or theoretical evidence in the literature to support its use as a hypothesis-testing model with adolescents.

Pender's model postulates that the likelihood of engaging in health-promoting behaviour is related to three sets of variables: (a) cognitive-perceptual variables, including the importance of health, self-efficacy, definition of health, perceived health status, perceived benefits of health-promoting behaviours, and perceived barriers to health-promoting behaviours; (b) modifying variables, including demographics, biological characteristics, interpersonal influences, situational factors, and behavioural factors; and (c) cues to action.

The Health Promotion Model forms an efficient organizing framework for studying the relationship between a health-promoting lifestyle in adolescent females and perceived health status, definition of health, self-efficacy, maternal health-promoting lifestyle, paternal health-promoting lifestyle, and selected demographics. The modified Health Promotion Model (Figure 1)

Figure 1

Modified health-promotion model



depicts a positive relationship between: (a) a health-promoting lifestyle and the cognitive-perceptual variables of definition of health, perceived health status, and self-efficacy in adolescent females; and (b) maternal and paternal health-promoting lifestyles and adolescent health-promoting lifestyles. The demographic variables are hypothesized to act as modifying factors of the cognitive-perceptual factors.

Research Questions

Based on the present state of knowledge and the conceptual framework of the study, the following questions were posed:

1. What are the relationships of maternal and paternal health-promoting lifestyles to a health-promoting lifestyle in adolescent females?
2. Of the following variables – perceived health status, definition of health, self-efficacy, maternal health-promoting lifestyle, paternal health-promoting lifestyle, and selected demographic characteristics – what are the best predictors of a health-promoting lifestyle in adolescent females?

Method

Design and Sample

A descriptive correlational design was used to explore the study questions. A stratified random sampling frame based on school and grade level was used to select a sample of 7th- to 12th-graders from two county schools in eastern

Nova Scotia. Junior high (grades 7,8,9) formed one stratum, and senior high (grades 10,11,12) the other stratum. A random sample was selected from each stratum using a table of random numbers and an enumerated master list of student names for each grade level provided by the school principals.

Criteria for inclusion in the study were: (a) ability to speak, read and understand English, (b) female adolescent attending junior or senior high school, (c) an intact mother-father dyad, (d) subjects' assent, and (e) parental consent to participate. Exclusion criteria included the presence of any chronic, debilitating emotional or physical illness such as severe heart disease or schizophrenia in the adolescent or the parent dyad. Individuals with these diagnoses were excluded so that such conditions would not confound interpretation of the findings.

Based on a power analysis for multiple regression analysis, the required sample size was determined to be 175 adolescent girls and their mothers and fathers. An oversampling of 50% ($N = 262$) was done to account for attrition. Of the initial 262 sets of questionnaires distributed, 217 (83%) were returned. However, 33 of the returned sets were not usable because of missing data or the presence of a severe illness in the subjects. Therefore, the final sample consisted of 184 adolescents and their mothers and fathers.

Methodological triangulation (Woods & Catanzaro, 1988) was accomplished by collecting and analyzing qualitative data from a subset of eight adolescent females to enrich the quantitative data and contribute to a further understanding of variables that influence a health-promoting lifestyle. Only the quantitative part of the investigation is reported in this paper.

The adolescents ranged in age from 12 to 19 years, with a mean age of 15 years ($SD = 1.70$). They were primarily Caucasian (95%), although other ethnic groups were represented. Parents ages ranged from 24 to 64 years, and their educational levels were from less than 7th grade to graduate school. All of the fathers and the majority of the mothers (52%) were employed outside the home. The median and mode family income was in the \$30,000 to \$39,000 range. The study sample reflects the adolescent population of the area.

Instruments

Health-Promoting Lifestyle Profile. Health-promoting lifestyle was defined as a "multidimensional pattern of self-initiated actions and perceptions that serve to maintain or enhance the level of wellness, self-actualization, and fulfillment of the individual" (Walker, Sechrist, & Pender, 1987, p. 77). The health-promoting lifestyle of each parent and adolescent was measured by the Health-Promoting Lifestyle Profile (Walker et al., 1987), a 48-item,

summated rating scale that measures six dimensions of the pattern of actions and perceptions that maintain and enhance the level of wellness of the individual. The dimensions include: self-actualization, health responsibility, exercise, nutrition, interpersonal support, and stress management. The 4-point response format to each item (1 = never to 4 = routinely) measured the respondent's self-reported health-promoting behaviours: the higher the total score, the better the health-promoting lifestyle of the individual.

Walker et al. (1987) reported a Cronbach's alpha of .92 for the total scale, with alphas on the subscales ranging from .70 to .90. A Pearson *r* was reported as .93 for the total scale, and ranged from .81 to .91 for the subscales. The Health-Promoting Lifestyle Profile has been used in previous studies with adolescents (Barnett, 1989; James, 1988), and produced a total internal consistency of .90 to .91, with alphas on the six subscales ranging from moderate to high. The alpha coefficients in this study ranged from .92 to .93 for the adolescents, mothers, and fathers.

Laffrey Health Conception Scale. Personal definition of health was measured by the Laffrey Health Conception Scale (Laffrey, 1986), which is based on Smith's (1981) description of health. It includes four dimensions: clinical (Clinical Health Conception Subscale), functional (Functional Health Conception Subscale), adaptive (Adaptive Health Conception Subscale), and eudaemonistic (Eudaemonistic Conception Subscale).

The Laffrey Health Conception Scale is comprised of 28 items in a Likert scale format (1 = strongly disagree, 6 = strongly agree). An individual's score was obtained by summing the seven items in each dimension, and then by summing all 28 items. Reliability, content, and construct validity results for the Laffrey Health Conception Scale have been reported by Laffrey (1986). The present study produced reliability coefficients ranging from .81 to .82 for the subscales and .90 for the total scale. Others who have used the Laffrey Health Conception Scale with young, middle, and late adolescents reported internal consistency coefficients for the total scale ranging from .87 to .91, and for the four subscales, internal consistency coefficients ranged from .75 to .91 (Barnett, 1989).

Perceived Health Status. Health status is defined as the individual's assessment of their level of health and well-being, and was measured by the Health Scale, a subscale of the Multilevel Assessment Instrument (Lawton, Moss, Fulcomer & Kleban, 1982). The self-rated Health Scale had four items, each with three or four response alternatives in a checklist format. The highest possible total score was 13, with a higher score indicating better health status. An internal consistency alpha coefficient of .76 and a test-retest reliability of .92

for the four-item scale was reported by Lawton et al. (1982). They also provided indications of criterion and construct validity. In the present study the alpha coefficient for the Health Status subscale was .58. A Spearman-Brown correction to eight items produced an alpha of .77 for the Health Status subscale.

Self-Efficacy. Self-efficacy defined as the belief that one is capable of performing the required behaviour necessary to produce a desired outcome (Pender, 1987, p. 62), was measured by scores on the General Self-Efficacy Subscale (Scherer et al., 1982). Total scores on this 17-item Likert instrument range from 17 to 85, with the higher end of the range indicating greater self-efficacy. The present study produced a reliability coefficient of .85. Scherer et al. (1982) and Scherer and Adams (1983) reported an alpha of .86 for the subscale and reported indicators of content, criterion, and construct validity. Others who have used the Self-Efficacy Scale with adolescents reported coefficient alphas ranging from .83 to .86 (Walker, Sandor & Sands, 1989).

Demographics. Sociodemographic data were collected on age, grade in school, school performance, ethnicity, parents' occupations, and annual household income.

Procedures

After parental and adolescent consent forms were received, the investigator administered a set of questionnaires to the adolescents in the auditorium/library of their respective schools at a prearranged and mutually agreeable time. The instrument packet contained the following: a demographic sheet, the Health Scale, the Laffrey Health Conception Scale, the General Self-Efficacy Scale, and the Health-Promoting Lifestyle Profile. The adolescents completed the instruments independently and placed the completed packet in the box provided. Upon completion of the questionnaires each adolescent was given two sealed envelopes: one for each of her parents. The envelopes contained a demographic sheet, the Health-Promoting Lifestyle Profile, and a letter explaining how to complete the questionnaires and when to return them to the investigator via their daughter. Each parent was asked to refrain from discussing any responses with their daughter or spouse until all the questionnaires were returned to the investigator at school one week later.

Data Analysis and Results

Data were analyzed using descriptive statistics and stepwise multiple regression with backward elimination of variables. Significance was accepted at the .05 level. The backward elimination procedure was selected for this study because the current state of knowledge of determinants of health-promoting lifestyles in adolescent females provides insufficient empirical or theoretical

evidence to support building a model based on independent variables. Through variable-selection methods based on statistical considerations, the backward elimination procedure begins with a model containing all the independent variables and then eliminates those that are of little use to the regression equation (Norussis, 1988). This procedure is useful for predicting a criterion variable, (in this case, adolescent health-promoting lifestyle), when there is limited knowledge of which independent variables are good predictors.

A residual analysis was conducted to measure the error of prediction of the adolescent's Health-Promoting Lifestyle Profile scores. It consisted of a normal probability scatterplot of standardized residuals in which the observed values were plotted against their expected values. Inspection of the computed plot provided evidence that the assumptions of normality, linearity, and homoscedasticity were met (Norussis, 1988).

What are the relationships of maternal and paternal health-promoting lifestyles to a health-promoting lifestyle in adolescent females?

To answer research question 1, a correlation coefficient was calculated. The Pearson correlation coefficient between mothers' Health-Promoting Lifestyle Profile scores and their daughters' Health-Promoting Lifestyle Profile scores was .28, $p < .01$. Similarly, the fathers' and daughters' Health-Promoting Lifestyle Profile scores were significantly but weakly correlated ($r = .16$, $p < .05$). Thus, the relationship between the mothers' and daughters' Health-Promoting Lifestyle Profile scores was stronger than was the relationship between the fathers' and daughters' Health-Promoting Lifestyle Profile scores. To determine if the strength of these two relationships were statistically different from each other, a Fischer r to z transformation was performed. Results produced a Z score of 1.26 which was not statistically significant.

What are the best predictors of a health-promoting lifestyle in adolescent females based on: perceived health status, definition of health, self-efficacy, maternal health-promoting lifestyle, paternal health-promoting lifestyle, and selected demographics?

In response to research question 2, a stepwise multiple regression with backward elimination of variables was used to determine the relationship of the predictor variables with the criterion variable of the adolescent's Health-Promoting Lifestyle Profile scores. The procedure began with a model containing all the predictor variables: perceived health status, definition of health, self-efficacy, maternal health-promoting lifestyle, paternal health-promoting lifestyle, and selected demographics. The marginal T was used to delete the variable with the smallest T value if this value was below the predetermined critical value of T . When a variable was dropped, a new regression equation was calculated using the remaining variables and the marginal T test. The

Table 1

Multiple regression of predictor variables with the criterion variable, Health-Promoting Lifestyle Profile in adolescent females (n=184)

Predictor variables	B	Beta Weight	Part Correlation	Percent Explained	t
Ethnicity	-11.570	-.172	-.16	5.5	-2.82
General Self-efficacy Scale	.413	.283	.26	9.3	4.33
Health Status	1.260	.137	.13	4.5	2.17
Functional Health Conception Subscale	.603	.224	.15	7.3	2.54
Eudaemonistic Health Conception Subscale	.717	.238	.17	7.7	2.85
Clinical Health Conception Subscale	-.421	-.208	-.19	6.7	3.18
r	.64				
r^2	.41				

process continued until all the predictor variables left in the model were significant. The removal criterion for each predictor was that the maximum probability of F-to-remove was significant at the .05 level.

Forty-one percent of the variance in the adolescent's Health-Promoting Lifestyle Profile scores was accounted for by the combined influence of Eudaemonistic Health Conception Subscale (7.7%), Functional Health Conception Subscale (7.3%), Clinical Health Conception Subscale (6.7%), General Self-Efficacy Scale (9.3%), Health Status (4.5%), and ethnicity (5.5%) (Table 1). The overall $F(6, 177)$ of 18.88 was significant at the .001 level. Of the individual variables, the General Self-Efficacy Scale had the greatest impact in predicting the adolescent's Health-Promoting Lifestyle Profile. A multiple correlation of .64 indicated a strong relationship between the predictor variables (self-efficacy; eudaemonistic, functional, and clinical definitions of health; perceived health status; and ethnicity) and the criterion variable the adolescent's Health-Promoting Lifestyle Profile. The remaining independent variables of maternal Health-Promoting Lifestyle Profile, paternal Health-Promoting Lifestyle Profile, and the demographic variables of age, grade level, grade performance, and family socioeconomic status did not significantly predict adolescent Health-Promoting Lifestyle Profile scores.

Discussion

The modified Health Promotion Model (Figure 1) was used solely as a general conceptualization of relationships rather than as a causal model to be tested with an adolescent population. From the data analysis, there is evidence that the following variables were positively and significantly correlated with the

adolescent's Health-Promoting Lifestyle Profile: functional and eudaemonistic definitions of health, self-efficacy, perceived health status, mother's health-promoting lifestyle, and father's health-promoting lifestyle. Clinical definition of health and ethnicity were negatively related to the adolescent's Health-Promoting Lifestyle Profile (beta weights of $-.21$ and $-.17$ respectively).

Perceived self-efficacy emerged as the strongest predictor of the adolescent's Health-Promoting Lifestyle Profile. This finding adds to the empirical support in the literature for the role of self-efficacy as a predictor of health-promoting lifestyle in adolescent (Barnett, 1989; De Vries, Dijkstra & Kuhlman, 1988; Levinson, 1986) and adult samples (Pender et al., 1990; Strecher, DeVellis, Becker & Rosenstock, 1986; Weitzel, 1989; Weitzel & Waller, 1990). The fact that self-efficacy is a significant predictor of the adolescent's Health-Promoting Lifestyle Profile may be related to developmental changes in the teen years. Adolescents are at an age where they are beginning to assume increased responsibility for their health and to expect greater mastery of personal and environmental factors that influence health. They view themselves as being independent, self-reliant, and able to make their own choices rather than conform to the opinions of others (Millstein, Petersen & Nightingale, 1993). These developmental changes appear to encourage sustained efficacy feelings. The findings of the current study suggest that if nurses can facilitate adolescent females' positive perceptions of their self-efficacy related to health behaviour skills, they may be more likely to initiate actions that enhance health-promoting lifestyles.

In keeping with the findings of Barnett (1989) who studied middle adolescent boys and girls, the current study provides support for the role of definition of health as an important predictor of the adolescent's Health-Promoting Lifestyle Profile. The current results are also consistent with a number of studies using adult subjects (Laffrey, 1986; Segall & Wynd, 1990; Volden, Langemo, Adamson & Oechsle, 1990).

No other studies have examined the influence of the specific subscales of the Laffrey Health Conception Scale on the adolescent's Health-Promoting Lifestyle Profile. However, the results of the current study are in keeping with the findings of Frank-Stromberg, Pender, Walker & Sechrist (1990) who reported that defining health as the presence of wellness (measured by a wellness subscale of health conception) was a significant predictor of Health-Promoting Lifestyle among adults with cancer.

The combined influence of functional, eudaemonistic, and clinical health conceptions accounted for 21% of the variance in the adolescent's Health-Promoting Lifestyle Profile scores. However, although clinical definition of health emerged as a significant predictor of the adolescent's Health-Promoting

Lifestyle Profile scores, its negative beta weight indicates that adolescents who defined health narrowly as the absence of illness were less likely to engage in a health-promoting lifestyle. A clinical view of health may not be congruent with a health-promoting lifestyle in adolescents. Both the functional and eudaemonistic subscales represent a positive view of health. Their retention in the regression equation suggests that adolescents whose definition of health includes wellness and the ability to fulfill socially defined roles are likely to engage in health-promoting lifestyles.

The findings suggest that definition of health can act as a motivator for engaging in health-promoting lifestyles. Health should be explored with adolescents as a concept over which they have control and personal responsibility: an opportunity for them to exercise autonomy by committing to health-promoting patterns of behaviour such as exercise and good nutrition. This should facilitate a sense of independence in decision-making and promote the adoption of healthy lifestyles.

The adaptive subscale did not contribute to predicting the adolescent's Health-Promoting Lifestyle Profile despite a highly significant zero-order correlation with the adolescent's Health-Promoting Lifestyle Profile ($r = .41$, $p < .01$). Caution must be used in interpreting this finding due to high inter-correlations (.70–.74) among the functional, adaptive, and eudaemonistic subscales of the Laffery Health Conception Scale. Due to multicollinearity, the variance shared by the three subscales may not have left enough unique variance for adaptive health conception to remain in the equation. It may still be important to consider, but when looked at in combination with the other subscales, it contains redundant information.

The results of this study are consistent with those of Donovan, Jessor & Costa (1991) who reported significant correlations between maternal modelling of health behaviour and involvement in health-related behaviour by female adolescents. According to Bandura's (1986) Social Learning Theory, vicarious experience or the role of modelling the behaviour of others can generate expectations that the on-looker also will be able to perform the activity. Traditionally, women in our culture, and particularly mothers, have assumed responsibility for promoting health and preventing disease in themselves and their families (Rosenstock, 1974). It appears that in the current sample of traditional families from a rural setting, mothers' and fathers' lifestyles influence the lifestyles of their adolescent daughters. Therefore, nurses should place more emphasis on health education of parents, and adolescents as future parents, and be aware that the health-promotion in adolescents also encompasses attention to parents' Health-Promoting Lifestyle Profile. Nurses should take advantage of opportunities to support

parents in modelling healthy lifestyles and to make them, especially mothers, aware of the link between their own health-promoting lifestyles and that of their daughters.

The results of this study provided limited support for the relationship of ethnicity to the adolescent's Health-Promoting Lifestyle Profile. However, given the disproportionate representation of Caucasian and non-Caucasian subjects, no general conclusions about ethnicity can be made.

A stepwise multiple regression analysis was employed in this study because it was assumed that model testing was premature. To date, there have been few scientific investigations of the determinants of a health-promoting lifestyle in adolescent females. Hence, there has been insufficient evidence to build an explanatory model of health-promoting lifestyles in this population.

The findings of this study are but a beginning in the search for understanding adolescent females' health-promoting lifestyles. Further research is recommended. The findings of the current study should be tested using hierarchical multiple regression analysis to determine direct and indirect predictors of Health-Promoting Lifestyle in adolescent females. Such theory testing would eventually lead to the development of a health-promotion model for adolescents. Broader subject selection criteria, heterogeneous sampling from rural and urban areas, and the perspective of adolescents who leave school before graduation should be incorporated in future studies. School drop-outs are quite likely to have different thoughts and patterns of lifestyle that should be investigated to fully understand the determinants of a Health-Promoting Lifestyle in adolescents.

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