

ASSESSMENT OF THE HEALTH CLASS CURRICULUM
OF AN OREGON HIGH SCHOOL

by

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A Thesis

Presented to
Oregon Health Sciences University
School of Nursing
in partial fulfillment of the requirements
for the degree of
Master of Science

June, 1990

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ACKNOWLEDGEMENTS

I would like to thank the members of my thesis committee, Lois Banke, Barbara Gaines and especially Julia Brown for the time they invested in this thesis project, their guidance and encouragement. I also wish to thank Margaret Edgar for her patience and support in transposing my manuscript and Richard Straw in the Psychology Department at Southern Oregon State College for his patience and help at the computer.

My deepest gratitude goes to Rudee' Libre' Papillon for her unending belief in my ability and her support. This thesis is respectfully dedicated to her memory.

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CHAPTER I

INTRODUCTION

Research has documented that genetic predispositions for some chronic diseases like cancer (CA), diabetes mellitus (DM), and cardiovascular disease (CVD) exist. These diseases are influenced not only by familial factors but also by environmental and behavioral factors as well. Genetic links to any disease represent a major non-controllable risk for developing that disease, and if combined with social controllable risk factors such as smoking, diet, exercise and stress can interact synergistically to aggravate and/or accelerate certain chronic diseases.

Identifying and intervening in controllable characteristics early in life has been a primary focus of preventive health education and research in the last decade. Since adolescence is a period of dramatic biologic, social, and emotional growth, it is an important time that marks both the evolution of the precursors of adult illness and the acquisition of health promoting behaviors (Long, 1987).

When it comes to their health, even if they know the principles for healthy living, adolescents don't always put their knowledge into practice. The attitudes they hold regarding their vulnerability to disease when based primarily on generic objective instructional information

can easily be disassociated to support a sense of invincibility. Parental support and involvement in behavioral change programs is more effective in producing positive behavioral changes that persist (Cresanta, Hyg, Burke, Downey, Freedman, & Berenson, 1986).

A descriptive study is proposed to explore how the 10th-grade students who received risk-factor instruction as part of their health class curriculum, coupled with an assessment of their genetic risk factors for certain chronic diseases, view their need for adopting healthy lifestyle behaviors.

REVIEW OF LITERATURE

Cardiovascular disease, with diabetes and hypertension as major contributors, continues to be the leading cause of adult death in the United States. In 1985 approximately 460,000 died from cancer and 991,000 of heart and blood vessel diseases at a national morbidity cost of \$71.5 billion for cancer (American Cancer Society, 1988) and an estimated \$83.7 billion for cardiovascular diseases for 1988 (American Heart Association, 1988). Medical research aimed at identifying causes for these diseases shows both environmental and genetic factors play key roles in their development and outcome.

Lifestyle modification is the cornerstone of any health prevention program (Nora, Lortcher, Spanger, Nora, & Kimberly, 1980) with a goal of reducing the mortality and morbidity of such chronic diseases. Primary prevention through modification of smoking, exercise, diet, weight, and stress behaviors are excellent initial steps. Significant hyperlipidemic reduction studies have shown early diet intervention for individuals with elevated cholesterol levels can reduce the rate of heart attack mortality by 24% and provide a 19% reduction in non-fatal myocardial infarctions ("Lipid Research Clinics Program", 1984).

From a standpoint of generic health, positive health practices resulting from interventions early in life, also have a cumulative effect and have been shown to be associated with an individual's positive future health and longevity (Belloc & Breslow, 1972; Breslow, 1978). Such health interventions occurring in the first two decades of life have the greatest potential for change, and behavioral changes adopted and consolidated by adolescence seem to persist into adulthood (Perry, Griffin, & Murray, 1985).

Since adolescence is a period of intense growth and change, it poses opportunities and challenges to health educators in maximizing optimal health-promoting

behaviors. Adolescents are commonly identified as society's health "risk takers" because of their covert and/or overt health-sabotaging lifestyles (Tonkin, 1987), frequently appearing to be more motivated in choosing pleasure/fun-seeking behavior as a counterpoint to boredom/routine rather than rational behavior (Zuckerman, 1971).

Several studies have focused on bringing understanding to the part that attitudes, knowledge, and intentions play, both separately and in conjunction with one another, in motivating the behaviors of adolescents. For example, Shepherd and Stockley (1987) found in a sample of predominantly young adults that their attitudes were a better predictor of behavioral intentions and actions in the consumption of foods high in fats than the nutritional knowledge they had to the contrary. In a large national survey of over 11,000 students in the 8th through 10th grades, it was found that despite warnings from health professionals and teachers, the majority of students still made negative health decisions (choices), drank alcoholic beverages, used drugs and tobacco, and were careless about avoiding injury ("Medical News & Perspectives, 1988).

Such studies, along with that of Feldman, Hodgson, Corber, and Quinn (1986), which surveyed the health care delivery needs of adolescents, speak to a sense of invincibility characteristic of adolescents in managing their health. The studies found the majority of adolescents surveyed engaged in negative health behaviors which, remarkably, they did not perceive as a problem. In other words, they did not believe the high risk health behaviors they engaged in would lead to a negative outcome for them. Forty-seven percent worried "a lot" or "some" over acne, compared to only 5% over chronic health problems, an interesting commentary on their health priorities, supporting a notion that they do not perceive their negative behavior as threatening.

The theory of reasoned action (Ajzen & Fishbein, 1980) offers one approach for explaining an individual's intentions in adopting health behaviors. A person's intention to adopt a behavior is a function of two basic determinants. One involves the individual's attitude or personal beliefs, and the other reflects social influences or subjective norms.

The theory holds that attitudes are a function of a person's beliefs and if he or she believe acting out a given behavior will result in mostly positive outcomes he or she will hold a favorable attitude toward that

behavior. If the outcome is viewed as mostly negative, the person will hold an unfavorable attitude toward the behavior. The beliefs that underlie a person's behavior are called behavioral beliefs.

"Subjective norms" are beliefs of a different type, namely an individual's perception of the normative beliefs of a specific person or groups. A behavior is more likely to be adopted if an individual believes the consequences are considered worthwhile by persons or groups the individual wishes to please, such as parents or peers, in contrast to knowledge they have about the behavior. The relative importance that personal beliefs and subjective norms have as determinants of behavior depends in part on the intention under investigation and varies among individuals. All variables influencing health behaviors are mediated through these two components and the perceived consequences (Hecker & Ajzen, 1983).

The theory of reasoned action lends understanding to the influence that peer, parental, and family interactions have on adolescent behavior in research. For example, substance use by friends (a subjective norm) was found to be a strong predictor of 10th grade students' substance use (Robinson et al., 1987). A comparison study on selected health risks such as smoking

and excessive weight, in relation to the presence or absence of parents, found that students missing one or both parents exhibited higher risk taking behavior than students living with both parents (Nolte, Smith, & O'Rourke, 1983). This finding suggests that the presence of parents and family life (the foundation of personal beliefs) is an essential factor in shaping adolescent attitudes. Additionally, students in behavior modification classes where active parent participation was encouraged, learned more than students in classes where parental participation was not encouraged (Allendorff, Sunseri, Cullian, & Oman, 1985). The findings suggest that parental presence might have acted as a reinforcer of students' personal beliefs and/or parental presence in the classroom's social structure acted as a positive reinforcer of subjective norms.

Attitudes around a risk behavior are not thought to change significantly or be affected by curriculum alone. They are relatively enduring orientations not altered drastically during a period of a few weeks. Rather they need continual reinforcement such as that received from parents/family/peers over a prolonged period to produce permanent change (Allendorff et al., 1985).

It may be that adolescents, as the theory of reasoned action asserts, are more likely to adopt a

behavior if the consequences of the behavior are considered worthwhile by persons or groups an adolescent wishes to please. If so, conducting school preventive health education programs that invite interaction among students, parents, and family, in addition to classroom instruction which includes peers and teacher interaction, might prove productive and warranted.

The literature supports the view that knowledge and information by themselves are not always strong motivators for the average adolescent in choosing positive lifestyle behaviors. Instead, such behaviors are influenced more by beliefs. Positive lifestyle choices, initiated early in life, then reinforced and supported by parents, peers and the school are important if the mortality and morbidity of chronic disease in our society are to be reduced. Incorporating a pedigree questionnaire/analysis in the existing health class curriculum, and requiring parental/family involvement would seem to be a positive addition to such reinforcement and support.

PURPOSE AND JUSTIFICATION

The purpose of this study is to explore how 10th-grade adolescents view their need to adopt positive lifestyle behaviors when, in addition to instruction, they, along with their family, are screened and receive

individual information regarding a genetic predisposition or lack of such predisposition for cancer, cardiovascular disease and diabetes.

An integral part of the 10th-grade health class curriculum in Jackson County is instruction regarding behavioral risk factor principles and modification. In 1989, as part of a collaborative pilot program between the Phoenix High School and the "Personal and Family Health Assessment" community task force, a Health Family Tree (HFT) pedigree computer-analyzed questionnaire was administered to all consenting 10th-grade health class students to identify those students with a genetic susceptibility for certain chronic diseases.

This collaborative approach to preventive health education in high schools is unique in Jackson County. Using not only a class instruction approach but also incorporating parent/family involvement in identifying genetic implications has not been done before. Do these 10th grade adolescents as a whole view the need for adopting positive lifestyle behaviors as important? Specific questions to explore are:

1. Do students feel vulnerable to high risk lifestyle behaviors and/or disease?

2. Do students view the need to modify lifestyle behaviors as only a need for those students screened positive for familial tendencies?

3. Do students see risky behavior as an adult problem, something they can worry about later?

4. Who do they believe should adopt positive lifestyle behaviors?

5. What do students see as standing in the way of their changing their behavior if they need to?

6. Do they plan to do anything differently?

7. Did they think that the HFT survey was an important part of their health class education?

Understanding adolescents' attitudes and motivations for adopting positive health practices is important when formulating health education classes. Unless health education is offered in schools from an orientation that is compatible and addresses these factors, "health education can experience poor reception and underutilization" (Levenson, Morrow & Pfefferbaum, 1984). The information derived from exploring these questions could help 10th grade health class teachers improve their health class program design to be more motivating and conducive to positive behavioral lifestyle changes.

CHAPTER II

METHOD

Subjects and Setting

All 10th-grade students enrolled in a high school in Jackson County, Oregon, comprise the subjects for this study. The school is located in a lumber and agricultural community, with a predominantly white, rural, lower middle class population. The school has approximately 700 students, of whom 202 were in the 10th grade.

During the 1988-89 school year, this school was the setting for an innovative preventive health program piloted by the Personal and Family Health Assessment (PFHA) Task Force. The PFHA Task Force is composed of community members from the Rogue Valley Medical Center, the Jackson County Health Department, Southern Oregon State College School of Nursing and teachers from the high school. The goal of the task force is to prevent or delay the onset of certain chronic diseases, namely, heart disease, stroke, hypertension, hypercholesterolemia, diabetes, and cancer of the breast, colon and lung. It proposes to do this first by identifying students from families with strong genetic tendencies for those diseases, and then by providing those at risk with follow-up counseling and education. Screening for risk is accomplished through use of the Health Family Tree

(HFT) Program, developed at Baylor College of Medicine in Houston, Texas, and marketed through the University of Utah which also does the completed survey computer analysis at a cost of \$7.50 per survey.

During the past school year, all 10th-grade students in this school were invited to participate in the pilot program. (See Appendix A.) Those students whose parents consented, took home HFT questionnaires to be completed in consultation with their families. The HFT was also the focal point in the 10th-grade required health course for instruction on hereditary disease, behavioral risk factors, and interventions to reduce risk for specific diseases. In addition, invitations were mailed to high risk families inviting them to attend a Family Health Fair on May 24, 1989, where health behavior information would be presented along with free cholesterol, blood sugar, blood pressure and colorectal cancer screenings. (See Appendix B.) Letters were also sent to other students and their families through flyers handed out in health class.

The present study was undertaken in part to evaluate the HFT program, and to determine whether identification of genetic tendencies appears to have a positive impact on these students' attitudes about behavioral risk factors. If so, the PFHA Task Force would like to expand

the program to screen all 10th-graders in Jackson County so that ultimately morbidity and mortality in the community may be reduced.

Of the 202 10th-grade students enrolled in school, 97 took health class in the fall, 1988, semester and 105 in the spring, 1989, semester. A total of 41 students participated in the Health Family Tree study in the fall, and 54 in the spring. Of those, 76 requested and were sent a computerized Family History Analysis free of charge.

Design and Procedure

This descriptive study employed a questionnaire to obtain information on the health behavior of students and their attitudes toward "healthy lifestyles". The study was viewed by the PFHA Task Force as an adjunct to their HFT program. Hence, no additional parental consent for student participation was necessary. (See Appendix C for a written statement from the PFHA Task Force coordinator and teacher at the high school, waiving the need for a separate consent.)

Prior to the administration of the questionnaire to the students in the classroom setting, the purpose of the research was explained. Potential risks and benefits of participating were discussed and questions answered, along with a review of key words and phrases such as

genetic risk factor, lifestyle behavior, Health Family Tree, and Family Health Fair. The only potential for a harmful effect apparent to the investigator is from the possible anxiety and stress felt by those students who have high expectations of themselves and perceive their answers to the behavioral questions in the questionnaire as negative. Such anxiety or stress was addressed in the preliminary explanation period by reminding them that they have control over the behavioral variables addressed and that the intent of the questionnaire was to evaluate whether the HFT was a beneficial part of their health education.

The students were assured that all information would be treated confidentially. No names appeared on the questionnaire. Coding of the questionnaires according to semester had as its only purpose, the creation of a discriminator with which one might compare differences in attitudes of the two groups of students toward adopting positive lifestyle behaviors.

Data Collection Instrument

The data for this research were derived from a 6-page questionnaire containing 33 multiple choice, dichotomous or fill-in questions. Two questions had comment sections. (See Appendix D for copy of Questionnaire.)

The questionnaire was reviewed by two 10th-grade instructors at Phoenix High School for clarity and language appropriateness for 10th-grade students. A small pilot study was performed by one of the teachers, using six 9th-grade students, who encountered no difficulty in completing the questionnaire.

Questionnaire items 15, 16, 19, 20, 21 and 22 were borrowed from The Rhode Island Department of Health's Teen Wellness Check. It is based on a prudent advice model and is reported to have face and content validity (B. Deery, Personal Communication, May, 1989). Permission to use the questions from the Teen Wellness Check questionnaire out of context (see Appendix E) was obtained from the Rhode Island Department of Health (see Appendix F).

First, the questionnaire asked whether or not students and their families had participated in the HFT Survey and the Family Health Fair (Questionnaire items 1 and 4), and whether or not they had been identified as having a genetic risk for cancer, heart disease or diabetes. (Questionnaire items 2 and 3.) This information they should be able to give, inasmuch as each family completing a family tree and requesting a returned Family History Analysis Sheet received one. That sheet indicated whether the family's genetic tendency was

strong, a possibility, or not apparent for stroke, early coronary disease, hypertension, hypercholesterolemia, diabetes, and breast, colorectal, or lung cancer. That report also analyzed the family's behavioral risk factors such as smoking, obesity, and exercise patterns. Both the strong tendency for a disease and a strong behavioral risk factor in a family received a 3 or 4 star rating, with 4 stars representing the greatest risk. (See Appendix G for sample analysis.) Thus, an individual identified as having a "4-star" family tendency for coronary heart disease and who smokes or has several family members who smoke, might also receive a 4-star rating for that controllable behavioral risk factor that compounds the probability of contracting the disease. It was presumed here that the report was read by the student as well as by other family members.

Next, students were asked if they attended the FHF, their opinions of the rewards derived from learning their genetic risks, the amount they learned in health class, and usefulness of the HFT (Questionnaire items 5 through 8.) The questionnaire elicited information on the students' perceptions as to their need to adopt lifestyle behaviors (Questionnaire items 9 through 14), and their present health behaviors (Questionnaire items 15 through 23). Next they were asked to evaluate how healthy their

lifestyle is, and to state whether they had identified a behavior they wish to change. If so, they were asked to list in order of influence, those things that stand in the way of their changing the known risky lifestyle behavior. (Questionnaire items 24 through 28.)

Socio-demographic data relating to age, sex, race, and the students' living arrangements (Questionnaire items 29 through 32) were requested, on the assumption that factors other than the classroom instruction, the HFT survey, or FHF might influence the students' attitudes about their health behavior. Information about such relationships might be helpful in designing future assessment programs. For instance, if it were found that students living at home with one or both parents manifested more positive attitudes toward health behavior, or were more likely to attend the Family Health Fair than students living with grandparents, guardians, or others, then a follow-up HFT education home visit might prove more beneficial for the latter students in future programs. Such students living in extended or non-traditional family situations if they were found to have a strong genetic risk factor for a disease, could be dealt with in an individual family home visit instead of collectively at the FHF.

Finally, the student was asked to rate his or her present health and how concerned he or she was about it.

(Questionnaire items 33 and 34.)

CHAPTER III

RESULTS AND DISCUSSION

Description of Respondents

The Family Tree and Health Questionnaire (FTH) was administered to two semesters of 10th-grade health class students, during regular school hours, on the first day of the last week of the 1988-1989 school year. Students who took the health class in the fall were enrolled in an alternative "career" class in the spring and were accessible as a group for the study during that class time. Alternatively, those students who took the "career" class in the fall were taking the health class in the spring and were available to the investigator. The students took an average of 12 minutes to complete the questionnaire. The questionnaires of these two groups of students were differentiated by the color of the paper.

Of the total 202 students taking 10th-grade health during the 1988-1989 school year, 138 completed all or a portion of the questionnaire. Ninety-seven students took health in the fall, and 71 were present the day the questionnaire was administered. Of that group, 70 students completed the questionnaire and one refused. One hundred five students took health in the spring, and 68 were present the day the questionnaire was administered, with no refusals. An attrition of 26 (27%)

for the fall semester and 37 (35%) for the spring is attributed to illness, moving out of the school district, and the usual decrease in school attendance during the last week of school.

It is assumed that all students surveyed took the required health class and that the significance of genetic risks and the importance of modifying lifestyle behaviors was stressed by the teacher. Because the fall semester students were taking the questionnaire out of the context of their fall health class, those who did not take "health" the previous fall were identified by a raise of hands and were not given a questionnaire to complete. It was assumed that the spring semester students all had taken the health class by virtue of their presence in the class at the time of the survey, and the teacher's assurance they all attended class the entire semester.

Five the 138 students completing the questionnaire, in answering Questionnaire item 7, said they had not taken part in the health class program on risky lifestyle behaviors - one from the fall class, and four from the spring class - even though they were in the health class referred to, and the teacher was certain they had. It is possible that these four students mistakenly interpreted the question to refer to the HFT Survey Program in which they may not have participated.

The combined sample of respondents from both semesters consisted of 75 (54%) males, and 63 (46%) females. The student refusing to complete the questionnaire was a male. The age of the participants ranged from 15 to 18 with a mean of 15.9 years.

The majority of the students completing the Family Tree and Health Questionnaire (94%) were living with either one ($n = 37$, 27%) or both ($n = 92$, 67%) parents. The remaining nine (6%) lived with either a grandparent(s) or other, which was not specified.

Student Evaluation of Health Class Content

The questionnaire elicited the students' opinions of the importance and usefulness of information about risky lifestyle behavior and genetic tendencies to major diseases. All 138 respondents had received classroom instruction on these topics, although five reported they had not. (It is possible that those students interpreted the questionnaire item incorrectly as referring to the HFT Survey Program.) Ninety-four students (47 males, 47 females) or 68% of the respondents had received additional information through their participation in the HFT Survey Program, and two through attending the evening Family Health Fair sponsored by the school.

The Personal and Family Health Assessment Task Force records indicated that the computer-analyzed results of

the HFT Survey had been mailed to the homes of the 76 participants who desired them. Apparently, many students did not read these reports, since only 45 of the respondents to this questionnaire said they were aware of the results. Of those 45 who were aware, 17 (38%) claimed they had "no apparent risk" (10 males, 7 females), 20 (44%) had a "possible tendency" (8 males, 12 females), and 8 (18%) had a "strong tendency" for either cancer, heart disease or diabetes (3 males, 5 females). (See Table 1.) Those students were able to specify the risks identified, i.e., 11 were at risk for heart disease or related risk factor, 9 for cancer, 6 for diabetes and 2 at risk for all three diseases (see Appendix H).

Results pertaining to the students' evaluation of the course content are presented in Tables 2 and 3. It may be noted that students who participated in the HFT program differed significantly from non-participants in their view of the importance of the information received (chisquare = 21.69, $p < .0002$). A majority (68%) of the participants judged the information about their genetic risk for cancer, heart disease or diabetes to be important or very important, whereas only 25% of the non-participants expressed such a belief. Only 19% of the participants but 50% of the non-participants thought such knowledge was of very little or no importance. HFT

Table 1

Numbers of Students Attending Health Class,
Participating in HFT, and Responding to Study
Questionnaire

Student Action	Fall	Spring	Males	Females	Total
Took Health Class ^a	97	105	--	--	202
Completed HFT	41	54			95
Completed HFT Received Analysis ^a	34	42	--	--	76
Completed HFT Analyzed Results Not Mailed ^a	7	12	--	--	19
Completed Study Questionnaire	70	68	75	63	138
Reported Not Participating In HFT ^b	21	22 ^c	28	15	43
Reported Participating In HFT ^b	49	45	47	47	94
Reported Being Aware of Risks ^b					
No Apparent	11	6	10	7	17
Possible	8	12	8	12	20
Strong	2	6	3	5	8
Total	--	--	21	24	45

a

Figures obtained from school records.

b

Figures obtained from student reports on study questionnaire.

c

One student did not know if he had participated.

Table 2

Mean Scores of Respondents for Selected Questionnaire Items

Questionnaire Item & Topic	HFT Non- Participants (n = 43)	HFT Part- icipants (n = 94)	Risk Identified		
			None (n = 17)	Possible (n = 20)	Strong (n = 8)
5-Knowledge important	3.38	2.33	2.18	2.20	2.50
6-More useful later	1.56	1.41	1.23	1.25	1.75
7-Amount learned	2.06	1.92	2.00	2.20	1.87
8-Recommend program	1.72	1.38	1.35	1.40	1.13

NOTE: Response choices to Questionnaire items 5 to 8 were as follow: for Item 5, "very important" (scored 1) to "not at all important" (scored 5): for Items 6 and 8, "yes" (scored 1), "no" (scored 2), "uncertain" (scored 3): for Item 7, "great" (scored 1), "moderate" (scored 2), some (scored 3) and very little (scored 4).

Table 3

Significance of Differences in Responses of HFT
Participants and Non-Participants with regard to Selected
Questionnaire Items

Questionnaire

Item & Topic	Chi-square	p
5 - Knowledge important	21.69	0.0002
6 - More useful later	2.40	0.3013
7 - Amount learned	4.89	n.s.
8 - Recommend program	9.60	0.0082

participants also recommended, to a significantly greater degree than non-participants (78% versus 53%), the continuation of the HFT program for future 10th-grade health classes (chi square = 9.60, $p < .008$). From Table 4 it may be noted that most of the students in the three identified risk categories (no apparent risk, possible risk and strong risk) recommended continuing the program. Volunteered comments were for the most part positive. For example, "HFT was informative", "accurate", "informational", "a good idea", "fun to learn how you can help yourself", and "depends on if people care". The two negative comments were, "It won't work if parents won't let their kids participate", and "I don't think anyone cares". (See Appendix H.)

HFT participants and non-participants did not differ significantly in their estimates of how much they had learned about risky lifestyle behaviors in their course, with 84% of the participants and 80% of the non-participants claiming to have learned a moderate to great amount. And both groups tended to agree that the value of knowledge on genetic risks would be more useful to them later in life, rather than now. (See Tables 2 and 3.)

Male and female students did not differ in the extent to which they participated in the HFT program.

Table 4

Number of Students Recommending Continuance of HFT Program

Group of Students	Yes	No	Uncertain
HFT Participants (n = 94)	73 (78)%	6 (6%)	15 (16%)
HFT Non-Participants (n = 43)	23 (53%)	9 (21%)	11 (26%)
Total (N = 137)	96 (70%)	15 (11%)	26 (19%)
Identified Risk			
No Risk (n = 17)	13 (76%)	2 (12%)	2 (12%)
Possible (n = 20)	16 (80%)	0 (0%)	4 (20%)
Strong (n = 8)	7 (88%)	1 (12%)	0 (0%)
Total (n = 45)	37 (82%)	3 (7%)	6 (13%)

NOTE: Students responded to Questionnaire item #8 "Would you recommend using the Health Family Tree Program in future tenth grade health classes?"

Neither did they differ in the extent to which they were aware of their risk status, nor extent of their risk. Again, there were no significant differences in the opinions of male and female students regarding the importance of the information, its future usefulness, or the amount they had learned about healthy lifestyles. However, a greater percent of the females (82%) than of the males (60%) recommended the HFT program.

In summary, the responding students, taken as a group, believed they had learned a moderate amount about healthy lifestyles. Participants in the HFT survey program were generally more positive in their evaluation of health class material than non-participants, placing more importance on learning about genetic risks, and being more willing to recommend continuance of the HFT program. This finding suggests that the HFT component was a useful adjunct to the health class curriculum in raising the consciousness of adolescents regarding their at-risk status. Perhaps these more positive attitudes were the result of their experience in the HFT program, or perhaps their positive attitudes led students to participate in the HFT. Even if the latter is the case, the program would seem to be of distinct value in providing receptive students with the opportunity to learn about their health risks and means of prevention.

However, it is somewhat discouraging to realize that a few students, although exposed to the information, were not aware of the fact; that the option of participation in the HFT survey was not accepted by 53% of the students; that of those who agreed to participate, 20% did not desire to have the results mailed to them, and of those who received computer-analyzed reports of their genetic risks, apparently 41% did not read them or learn from them. Clearly, continuing efforts to increase the involvement and interest of the students in healthy lifestyles are indicated. Innovative teaching strategies are needed if the potential benefits of this health promotive program with adolescents are to be maximized.

Perceived Benefits of Healthy Lifestyle Behavior

Students' perceptions of susceptibility to disease and the need to adopt healthy lifestyle behaviors were elicited by Questions 9 through 14.

Specifically students were asked whether they believed both that persons with or persons without genetic tendencies to a disease were likely to contract the disease, whether healthy lifestyle behaviors can prevent disease in persons with or without genetic tendency for disease, and whether healthy lifestyle behavior is as important for adolescents as for older adults. Responses indicating belief in the vulnerability

of all individuals, and in the importance of lifestyle behavior were regarded as indicating a positive or favorable attitude on the part of the student toward healthy lifestyle behavior. Responses indicating a lack of such beliefs reflected a negative or unfavorable attitude.

In Table 5, the numbers and percentages of all respondents, and of HFT participants and non-participants are presented. From that table, it is clear that a substantial majority of the respondents, taken as a total group, believe a healthy lifestyle is useful in helping prevent disease in persons with or without a genetic predisposition. Students generally admit that persons without genetic tendencies may contract heart disease, cancer and diabetes. Somewhat fewer, but still a majority, reject a fatalistic attitude and deny the inevitability of disease. There is more ambivalence regarding the need for adolescents to adopt healthy lifestyle behavior, in that a majority thought the information more pertinent for those at genetic risk.

From Table 5, it may be seen that HFT participants consistently expressed more positive attitudes than non-participants. The percentage of favorable responses was greater in every instance for participants, although the difference between the two groups was very small with

Table 5

Number and Percent of Respondents Expressing Favorable Views Toward Benefits of Healthy Lifestyle Behavior: by HFT Participation

Questionnaire Item	Students Responding Favorably					
	Total Respondents		HFT Participants		Non-Participants in HFT	
9-Healthy lifestyle useful for persons at genetic risk	114	(82.6%)	82	(87.2%)	32	(74.4%)
10-Healthy lifestyle more important for adults	76	(55.1%)	57	(60.6%)	19	(44.2%)
11-Healthy lifestyle useful for persons not at genetic risk	115	(83.3%)	83	(88.3%)	32	(74.4%)
12-Nothing can be done to prevent	91	(65.9%)	64	(68.1%)	27	(62.8%)
13-Unlikely to get disease if no genetic risk	97	(70.3%)	73	(77.7%)	24	(55.8%)
14-Information more important for persons with genetic risk	67	(48.6%)	49	(52.1%)	18	(41.9%)

NOTE: The base for percentaging was: for Total Respondents, $N = 137$; for HFT participants, $n = 94$; and for non-participants in HFT, $n = 43$.

regard to the role of fate in the occurrence of disease. Table 6 summarizes the results of testing for the significance of differences in responses between HFT participants and non-participants. Although mean scores of participants suggest that they have a more positive attitude about healthy lifestyle behavior than non-participants, the differences were not statistically significant by t-test.

Females generally perceived more benefits in healthy lifestyle behaviors than did males. The numbers and percentages of male and females answering positively to the several items are presented in Table 7, and the mean scores of male and female students are presented in Table 8. The differences between the sexes in their scores were statistically significant for every question except one (Table 8). Females more than males (a) believed that healthy lifestyle behavior might prevent disease in persons both with and without a genetic tendency; (b) denied that it was more important for adults than adolescents to adopt healthy lifestyles; (c) denied that it was unlikely for persons without genetic predispositions to get cancer, heart disease or diabetes; and (d) did not believe that information on lifestyles was more important for students with genetic risks than for others. The sexes did not differ significantly with

Table 6

Differences in Mean Scores of HFT Participants and Non-participants on Questionnaire Items Relating to Benefits of Health Lifestyle Behavior

a Questionnaire Item	HFT Partici- pants (n = 94)	Mean Score Non-partici- pants (n = 43)	t-test	p
9-Healthy life- style useful for persons at genetic risk	1.88	2.00	0.86	0.39
10-Healthy life- style more important for adults	2.43	2.40	1.45	0.15
11-Healthy life- style useful for persons not at genetic risk	1.84	2.00	1.22	0.23
12-Nothing can be done to prevent	2.86	2.63	1.34	0.18
13-Unlikely to get disease if no genetic risk	2.88	2.63	1.62	0.11
14-Information more important for persons at genetic risk	2.52	2.37	1.60	0.11

a

All items were scored from 1 ("strongly agree") to 4 ("strongly disagree"). Items 9 and 11 are positive statements, with a score of 1 representing a favorable attitude, and a score of 4, an unfavorable attitude. Items 10, 12, 13 and 14 are negative statements, with a score of 1 representing an unfavorable attitude and a score of 4, a favorable attitude.

Table 7

Number and Percent of Respondents Expressing Favorable
Views Toward Benefits of Healthy Lifestyle Behavior:
By Sex

Questionnaire Item	Students Responding Favorably			
	Males		Females	
	n	%	n	%
9-Healthy lifestyle useful for persons at genetic risk	60	(80.0%)	54	(85.7%)
10-Healthy lifestyle more important for adults	35	(46.7%)	41	(65.1%)
11-Healthy lifestyle useful for persons not at genetic risk	57	(76.0%)	58	(92.1%)
12-Nothing can be done to prevent	48	(64.0%)	43	(68.3%)
13-Unlikely to get disease if no genetic risk	49	(65.3%)	48	(76.2%)
14-Information more important for persons at genetic risk	31	(41.3%)	36	(57.1%)

NOTE: The base for percentaging was: for males, n = 75,
for females, n = 63.

Table 8

Difference in Mean Scores of Male and Female Students on
Questionnaire Items Relating to Benefits of Healthy
Lifestyle Behaviors

Questionnaire Item	Mean Scores		t-test	p
	Males n = 75	Females n = 63		
9-Healthy life- style useful for persons at genetic risk	2.05	1.73	2.53	0.0127
10-Healthy life- style more im- portant for adults	2.41	2.79	2.24	0.0269
11-Healthy life- style useful for persons not at genetic risk	2.04	1.68	2.95	0.0038
12-Nothing can be done to prevent	2.77	2.79	0.13	0.8966
13-Unlikely to get disease if no genetic risk	2.68	2.95	2.12	0.0362
14-Information more important for persons at genetic risk	2.36	2.69	2.75	0.0068

a

All items were scored from 1 ("strongly agree") to 4 ("strongly disagree"). Items 9 and 11 are positive statements, with a score of 1 representing a favorable attitude, and a score of 4, an unfavorable attitude. Items 10, 12, 13 and 14 are negative statements, with a score of 1 representing an unfavorable attitude and a score of 4, a favorable attitude.

respect to the role of fate in causing disease, with a majority of both groups expressing disbelief.

The mean scores of the 45 students who had their risks assessed did not differ substantially from the mean scores of the participants. T-tests comparing their scores with the scores of other HFT participants and with the non-participants did not prove to be statistically significant.

In summary, students generally appeared to share a belief that everyone is potentially vulnerable to disease. They also considered healthy lifestyle behaviors to be an important means by which young and old, and individuals with or without genetic risk might avoid disease. Most were not fatalistic, but believed individuals have some control over their health. Most did not see the contracting of cancer, cardiovascular disease, or diabetes as inevitable for persons with genetic risk. Evidently, many students did not view genetics and age as necessarily exercising a greater influence on illness than lifestyle.

Student Lifestyle Behavior

In an effort to simplify the analysis of the students' reports of their lifestyle behavior (Questionnaire items 15 - 23), responses were dichotomized into "healthy" or "risky", according to

accepted health behavior criteria. For "healthy behavior" the criteria were: breakfast should be eaten every day, and each day food should be chosen from the four food groups, and be low in fat/cholesterol, and limited in salt. Further, it is recommended that people should seldom or never eat sugary food as a snack, should exercise aerobically at least three times a week, that adolescents should not smoke or drink alcohol, and everyone should engage in activities to reduce stress at least five times a week. The numbers and percentages of respondents making "healthy" responses with regard to the designated lifestyle behaviors are shown in Table 9. The students' mean scores on the nine items were also calculated to measure how risky or healthy their behaviors were.

From their self-reports, the students of this study as a whole did not lead exemplary healthy lives. Table 10 indicates that only a minority of the respondents followed strictly the canons of good nutrition, exemplified in the criteria stated above, and only a minority regularly engaged in activities to reduce stress. In defense of the students, it should be noted that 66% did report eating breakfast 5-6 days a week, that 66% said they chose foods from the four food groups 5-6 days a week, and 76% said they tried to limit salt

Table 9

Number and Percent of Respondents Reporting Healthy Lifestyle Behaviors: by HFT Participants and by Sex

Health Behavior Item	Group	HFT Participants (n = 94)		Non-participants (n = 43)	
		Healthy n (%)	Risky n (%)	Healthy n (%)	Risky n (%)
15-Eat breakfast	Males	15 (32%)	32 (68%)	9 (32%)	19 (68%)
	Females	16 (34%)	31 (66%)	6 (40%)	9 (60%)
	Total	31 (33%)	63 (67%)	15 (35%)	28 (65%)
16-Eat 4 food groups	Males	11 (23%)	36 (77%)	8 (29%)	20 (71%)
	Females	15 (32%)	32 (68%)	5 (33%)	10 (67%)
	Total	26 (28%)	68 (72%)	13 (30%)	30 (70%)
17-Low fat/chol.	Males	5 (11%)	42 (89%)	1 (4%)	27 (96%)
	Females	7 (15%)	40 (85%)	5 (33%)	10 (67%)
	Total	12 (13%)	82 (87%)	6 (14%)	37 (86%)
18-Limit salt	Males	8 (17%)	39 (83%)	6 (21%)	22 (79%)
	Females	15 (32%)	32 (68%)	4 (27%)	11 (73%)
	Total	23 (24%)	71 (76%)	10 (23%)	33 (77%)
19-Don't snack	Males	10 (21%)	37 (79%)	2 (7%)	26 (93%)
	Females	12 (26%)	35 (74%)	6 (40%)	9 (60%)
	Total	22 (23%)	72 (77%)	8 (19%)	35 (81%)
20-Aerobic exercise	Males	27 (57%)	20 (43%)	16 (57%)	12 (43%)
	Females	28 (60%)	19 (40%)	10 (67%)	5 (33%)
	Total	55 (59%)	39 (41%)	26 (60%)	17 (40%)
21-Don't smoke	Males	41 (87%)	6 (13%)	23 (82%)	5 (18%)
	Females	39 (83%)	8 (17%)	10 (67%)	5 (33%)
	Total	80 (85%)	14 (15%)	33 (77%)	10 (23%)
22-Don't drink	Males	27 (57%)	20 (43%)	13 ^a (46%)	15 (54%)
	Females	41 (87%)	6 (13%)	9 ^a (64%)	5 (36%)
	Total	68 (72%)	26 (28%)	22 (52%)	20 (48%)
23-Reduce stress	Males	19 ^b (43%)	25 (57%)	5 ^a (19%)	22 (81%)
	Females	25 (53%)	22 (47%)	6 ^a (43%)	8 (57%)
	Total	44 (48%)	47 (52%)	11 (27%)	30 (73%)

^a Data missing for 1 student.

^b Data missing for 3 students.

Table 10

Number and Percent of HFT Participants and
Non-participants Reporting Healthy Lifestyle Behavior

Health Behavior Item	All Respondents		HFT Parti- pants		Non-Partici- pants		Chi-square
	n	(%)	n	(%)	n	(%)	
15-Eat breakfast	46	(33.6%)	31	(33.0%)	15	(34.9%)	n.s.
16-Eat 4 food groups	39	(28.5%)	26	(27.7%)	13	(30.2%)	n.s.
17-Low fat/chol.	18	(13.1%)	12	(12.8%)	6	(14.0%)	n.s.
18-Limit salt	33	(24.1%)	23	(24.5%)	10	(23.3%)	n.s.
19-Don't snack	30	(21.9%)	22	(23.4%)	8	(18.6%)	n.s.
20-Aerobic exercise	81	(59.1%)	55	(58.5%)	26	(60.5%)	n.s.
21-Don't smoke	113	(82.5%)	80	(85.1%)	33	(76.7%)	n.s.*
22-Don't drink	90 ^a	(66.2%)	68 ^b	(72.3%)	22 ^c	(52.4%)	5.18
23-Reduce stress	55 ^a	(41.7%)	44 ^b	(48.3%)	11 ^d	(26.8%)	5.42

NOTE: Base for percentaging, for all respondents, $N = 137$;
for HFT participants, $n = 94$; for non-participants,
 $n = 43$.

*

$p < .03$.

a

Data missing for 5 students.

b

Data missing for 3 students.

c

Data missing for 1 student.

d

Data missing for 2 students.

once or twice a week. Students performed best with regard to regular exercise and abstention from alcohol and tobacco. Thus, about 60% reported they exercised at least three times a week, 66% did not drink alcohol, and 83% did not smoke (See Table 10). It is however still a matter of concern that 40% of these 10th-grade students did not exercise sufficiently often, that over 30% drank alcohol and over 15% smoked.

The lifestyles of HFT participants did not appear to be much healthier than those of non-participants. (See Table 10.) Chi-square analyses indicate that the two groups did not differ significantly in their nutritional habits. However, a significantly smaller proportion of HFT participants than non-participants drank alcohol (chi-square = 5.18, $p < .03$) and a larger proportion engaged regularly in activities to reduce stress (chi-square = 5.42, $p < .02$).

Data concerning the numbers and percentages of males and females reporting healthy lifestyle behaviors are summarized in Table 11. These data indicate that a greater proportion of females generally, regardless of HFT participation, reported healthier behavior than did males in all areas examined except smoking. However, only three of these differences are statistically significant. Thus, proportionately more females than

Table 11

Number and Percent of Male and Female RespondentsReporting Healthy Lifestyle Behavior

Health Behavior Item	Males		Females		Chi-square
	n	(%)	n	(%)	
15-Eat breakfast	24	(32.0%)	22	(35.5%)	n.s.
16-Eat 4 food groups	19	(25.3%)	20	(31.7%)	n.s. *
17-Low fat/chol.	6	(8.0%)	12	(19.0%)	3.33
18-Limit salt	14	(18.7%)	19	(30.6%)	n.s.
19-Don't snack	12	(16.0%)	18	(29.0%)	n.s.
20-Aerobic exercise	43	(57.3%)	38	(61.3%)	n.s.
21-Don't smoke	64	(85.3%)	49	(79.0%)	n.s. **
22-Don't drink	40 ^a	(53.3%)	50 ^b	(82.0%)	13.17 *
23-Reduce stress	24	(33.8%)	31 ^b	(50.8%)	3.93

NOTE: Basis for percentaging, for males, $n = 75$; for females, $n = 63$.

a
Data missing for 4 males.

b
Data missing for 1 female

*

$p < .05$.

**

$p < .001$.

males routinely selected foods low in fats and cholesterol (chi-square = 3.33, $p < .05$), abstained from alcohol (chi-square = 13.17, $< .001$), and engaged in stress-reducing activities (chi-square = 3.93, $p < .05$).

Those students who had received reports on their genetic risk status did not appear to differ markedly from the other participating students as indicated in Table 12. Their lifestyle was only slightly healthier in regards to drinking alcohol and slightly riskier in their selecting foods from the four food groups and limiting salt. Otherwise, just as other HFT participants and non-participants, they selected foods low in fats or cholesterol only 1 or 2 times a week, and they all ate sugary snacks on the average of at least 3 times a week. It is difficult to make distinctions among the three risk categories (no apparent, possible, and strong risk) because the numbers are small. However, females ($n = 24$) tended to report slightly more healthy behaviors than males ($n = 21$) and differed from males in the frequency with which they selected foods from the four food groups ($F = 8.32$, $p < .05$, $df = 2$), and the five females with a strong at-risk tendency were most risky in their consumption of snacks daily.

How healthy did the 10th-grade students in this sample consider their present lifestyle to be? When

Table 12

Number and Percent of HFT Participants and Students With Identified Genetic Risks Who Reported Healthy Lifestyle Behaviors

Questionnaire Item	HFT Participants		Identified Risks	
	n	(%)	n	(%)
15-Eat breakfast	31	(33.0%)	17	(38%)
16-Eat 4 food groups	26	(27.7%)	8	(17%)
17-Low fat/chol.	12	(12.8%)	6	(13%)
18-Limit salt	23	(24.5%)	6	(13%)
19-Don't snack	22	(23.4%)	12	(27%)
20-Aerobic exercise	55	(58.5%)	25	(56%)
21-Don't smoke	80	(85.1%)	40	(89%)
22-Don't drink	68	(72.3%)	39	(87%)
23-Reduce stress	44 ^a	(48.3%)	20 ^b	(45%)

NOTE: The basis for percentaging was: for HFT participants, n = 94, for students with identified genetic risk, n = 45.

^a Data missing for 3 students.

^b Data missing for 1 student.

asked this question (Questionnaire item 24), the modal response for the entire group was "somewhat healthy". (See Table 13.) The fact that 60% judged their lifestyle to be unhealthy or only somewhat healthy suggests an awareness on the part of the students that their behavior was somewhat problematic. Perhaps this critical attitude was in part a product of the health class curriculum.

Chi-square analysis revealed that HFT participants did not differ significantly from the non-participants in their opinions. Neither did the male students differ from the female, nor those in the identified risk group from the others. It is of interest, that all the males in the identified genetic risk group ($n = 21$) consistently rated their lifestyle to be healthy. Females were more critical, with the 12 at possible risk feeling their lifestyle was "somewhat" healthy and the 5 at strong risk feeling it was "not very" healthy.

Almost all students claimed they were concerned about their health, 61% "quite a lot" or "very much", 35% "somewhat", and only 4% "not very" or "not at all". (See Table 14.) This expression of concern suggests that at least 60% of the students would be open to messages to change their lifestyles in the direction of more healthy habits. HFT participants expressed more concern than did non-participants ($\chi^2 = 5.29, p < .03$, when groups

Table 13

Student Responses to Question: "How healthy do you consider your present lifestyle?"

Group	Healthy or Very Healthy		Somewhat Healthy		Not Very or Not At All Healthy	
	n	(%)	n	(%)	n	(%)
Total Sample	55	(40%)	68	(50%)	14	(10%)
Participants	37	(39%)	47	(50%)	10	(11%)
Non-participants	18	(42%)	21	(49%)	4	(9%)
Males	37	(49%)	32	(43%)	6	(8%)
Females	19	(30%)	36	(57%)	8	(13%)
Identified Risk	14	(31%)	24	(53%)	7	(16%)

Table 14

Student Responses to Question: "How much are you concerned about your health?"

Group	Very Much		Quite A Lot		Somewhat		Not Very Much or Not At All	
	n	(%)	n	(%)	n	(%)	n	(%)
Total Sample	31	(23%)	52	(38%)	48	(35%)	6	(4%)
Participants	22	(23%)	41	(44%)	28	(30%)	3	(3%)
Non-participants	9	(21%)	11	(26%)	20	(46%)	3	(7%)
Males	17	(22%)	29	(39%)	23	(31%)	6	(8%)
Females	14	(22%)	23	(37%)	26	(41%)	0	(0%)
Identified Risk	11	(24%)	21	(47%)	13	(29%)	0	(0%)

were dichotomized at "somewhat" or less versus "quite a lot" or more). Males did not differ significantly from females in their expression of concern for health; and the identified risk group did not differ from the rest of the sample.

Despite some doubts about the healthiness of their lifestyles, students on the whole (74%) believed their health was good or excellent and 26% fair. None of them considered their health poor (See Table 15). These figures are consistent with the 1988 national figures regarding the self-assessment of health by teenagers in similar sociodemographic and age categories. Seventy-two percent of teenagers in the nation reported their health status to be either very good or excellent, 27% good or fair and 0.5% poor (National Center for Health Statistics, 1989). There were no significant differences between the self-ratings of HFT participants and non-participants, nor between males and females, nor yet between those in the identified risk group and all others.

To summarize, the majority of students reported risky eating and stress-reducing behaviors, but healthy behaviors regarding exercise, smoking and alcohol. HFT participants differed from non-participants in that a significantly smaller proportion drank alcohol, and a

Table 15

Student Response to Question: "How would you rate your health overall?"

Group	Excellent		Good		Fair	
	n	(%)	n	(%)	n	(%)
Total Sample	20	(15%)	81	(59%)	36	(26%)
Participants	12	(13%)	60	(64%)	22	(23%)
Non-participants	8	(19%)	21	(64%)	14	(32%)
Males	14	(19%)	46	(61%)	15	(20%)
Females	7	(11%)	35	(56%)	21	(33%)
Identified Risk	4	(9%)	29	(64%)	12	(27%)

NOTE: No student rated his or her health "poor".

larger proportion used stress-reduction techniques. Perhaps the non-participants used alcohol as a stress reducing mechanism, whereas the participants substituted more healthful alternatives to reduce stress.

Participants also tended to be more concerned than non-participants about their health. Perhaps this concern grew out of their involvement in the HFT survey. Or perhaps their concern motivated them to become involved in the HFT survey. Usually, when persons are concerned about their health, they tend to take better care of themselves and are more interested in educational information such as the HFT survey to facilitate that concern. Students whose genetic risk tendencies had been evaluated did not differ from the other students in their health behavior, or in their ratings of their health, their lifestyles, or health concern.

The females in this sample did not differ from the males in the extent to which they viewed their lifestyle as healthy, in their concern for health, or in their subjective evaluation of their health status. The proportion of females reporting healthy behaviors was greater than the proportion of males for all of the nine designated behaviors except smoking. However, the differences were statistically significant only in the instances of selecting low-fat foods, in abstaining from

drinking and engaging in stress-reducing activities. The greater tendency of females than of males to select low-fat foods, and the fact that a greater proportion of females avoided snacking may be interpreted in terms of the emphasis young women place on slimness. The greater tendency of males to drink alcohol might be attributed to the "macho" image of such behavior, or male use of alcohol as a stress-reducer. At any rate, the finding is in accord with other literature indicating greater alcohol consumption among high school males (National Institute on Drug Abuse, 1975-1988). Finally, it is tempting to exaggerate the importance of the finding that a larger proportion of females smoked in the light of national data indicating a rise in tobacco use by teenage girls. National surveys of adolescents have shown the prevalence of smoking to be greater among females than males (Gritz, 1988; Report of the Surgeon General, 1989). However, it must be noted that for this sample, the difference between males and females was not statistically significant.

The teenage females in this sample, then, would appear to have healthier lifestyles than the males. In addition, as noted previously, the females as a group expressed more positive attitudes toward the benefits of healthy lifestyle behaviors. These positive attitudes

may have motivated them to make a more critical appraisal of their behavior than did the males, and therefore, to engage in more healthy behaviors. It is unfortunately not known whether they had made changes toward healthy living recently, since enrolling in the health class.

Student Attitudes Toward Changing Behaviors

Four questions explored aspects of the students' motivation to change risky lifestyle behaviors. First, students were asked (Questionnaire item 25) whether they had tried to make a healthy lifestyle change in their lives recently. They might answer "Yes", and specify the change, or "No, my lifestyle is healthy". That qualifier suggests that the student felt positive about his/her lifestyle and did not see a need to change. The results are displayed in Table 16. Forty percent of the students indicated they had made a change recently. HFT participants were no more likely to have changed than non-participants, and those students who had received reports on their genetic risk status had made no more changes than their counterparts. However, gender was a significant factor, with females tending to make changes more frequently than males.

Written comments listed exercise and diet as the behaviors most frequently targeted for change, understandable in light of students' earlier responses

Table 16

Student Responses to Question: "Have you tried to make a 'healthy lifestyle' change in your behavior recently?"

Group	No		Yes		Chi-square
	n	(%)	n	(%)	
Total Sample ^a	81	(60%)	56	(40%)	
Participants ^a	55	(59%)	38	(41%)	n.s.
Non-participants	26	(60%)	17	(40%)	
Males	51	(68%)	24	(32%)	5.40*
Females ^a	30	(48%)	32	(52%)	
No Identified Risk	55	(59%)	38	(41%)	n.s.
Identified Risk	26	(59%)	18	(41%)	
No apparent	10	(59%)	7	(41%)	
Possible ^a	11	(58%)	8	(42%)	
Strong	5	(62%)	3	(38%)	

NOTE: The base for percentaging was: for total respondents, $N = 137$; for HFT participants, $n = 93$; for non-participants in HFT, $n = 43$; for males, $n = 75$; for females, $n = 62$; and for students with identified risk, $n = 44$.

^a Data missing for 1 student.

* $p < .02$.

indicating that the dietary habits of a majority of students were "risky" rather than healthy. It is, of course, possible that such changes were initiated less for the sake of health than for appearance, given the importance of slimness in our society. The present data provided no way to determine the relative power of these two alternative motivators. Interestingly, two subjects wrote that they had not tried to make changes because they were satisfied with their lifestyles, even though they recognized they were not healthy. (See Appendix H.)

A second question asked respondents if they had identified a risky lifestyle behavior they wanted to change in the future, and, if so, what it was. The results are presented in Table 17. Again, a minority (38%) of the total sample indicated a desire to change. Again, the responses of HFT participants and non-participants were remarkably similar. Males and females differed significantly, with females expressing the greater desire to change, and the students who were aware of their genetic risk status indicated a significantly greater desire to change than did the other students. The latter finding suggests that being informed of their risks may induce teenagers to acknowledge risky behavior and to contemplate change. That in itself might be

Table 17

Student Responses to Question: "Have you identified a risky lifestyle behavior of yours that you want to change?"

Group	No		Yes		Chi-square
	n	(%)	n	(%)	
Total Sample	86	(62%)	52	(38%)	
Participants	58	(62%)	36	(38%)	n.s.
Non-participants	27	(63%)	16	(37%)	
Males	56	(75%)	19	(25%)	10.67*
Females	30	(48%)	33	(52%)	
No Identified Risk	65	(70%)	28	(30%)	6.88**
Identified Risk	21	(47%)	24	(53%)	
No apparent	9	(53%)	8	(47%)	
Possible	8	(12%)	12	(60%)	
Strong	4	(50%)	4	(50%)	

NOTE: The base for percentaging was: total respondents, $N = 138$; for HFT participants, $n = 94$; for non-participants in HFT, $n = 43$; for males, $n = 75$; for females, $n = 63$; and for students with identified risk, $n = 45$.

*

$p < .001$.

**

$p < .01$.

viewed as a significant contribution by the HFT to the health class.

Diet and exercise were again the behaviors which most repondents wished to change. Diet was mentioned 30 times, exercise 20, smoking 5 and drinking 3 times. (See Appendix H.) Students seemed to understand that their behavior in those areas was problematic and in need of change to healthier forms.

A third question asked those respondents who had indicated a desire to change a risky behavior was to indicate what had made them want to change. From Table 18 it may be seen that the health class was most frequently cited by the group as a whole, by participants and non-participants, and by students with identified risk status. In each instance, the percent was about 70%. Peers were the next most frequently cited motivating agent, surpassing parents. (The "other" category included "myself" 10 times, physical problems or illness, 6 times, and television, girlfriend, fear of disease, each mentioned once.) The HFT program did not fare so well. None of the non-participants in the HFT (which is logical) and only four participants, all from the group aware of genetic risk status, stated the HFT program inspired them to change. Perhaps HFT participants who cited the health class as a major

Table 18

Student Responses to Question: "What made you want to change that risky behavior?"

Motivating Agent for Change	Total Sample		HFT Participants		Non-participants		Risk Identified	
	n	(%)	n	(%)	n	(%)	n	(%)
Health class	37	(71%)	26	(72%)	11	(69%)	17	(71%)
HFT	4	(8%)	4	(11%)	0	(0%)	4	(17%)
Peers	16	(31%)	11	(31%)	5	(31%)	4	(17%)
Parents	10	(19%)	7	(19%)	3	(19%)	4	(17%)
Doctor	8	(15%)	6	(17%)	2	(13%)	6	(25%)
Others	21	(40%)	11	(31%)	10	(63%)	0	(0%)

NOTE: Base for percentaging was for Total Sample, $n = 52$; for HFT participants, $n = 36$; for non-participants, $n = 16$; for students with risk identified, $n = 24$. These are the numbers of students who stated they wanted to change a risky lifestyle behavior. Some checked more than one agent.

motivator believed that in so doing they were including the HFT component.

It is interesting to note that student responses about the amount of information they had learned in health class (Questionnaire item 7) did not relate to their responses regarding their motivation to adopt more healthy lifestyles (Questionnaire items 25 and 26). Chi-square analysis revealed that respondents claiming to have learned a great deal were no more inclined to make a change or contemplate making a change, than were those stating they had learned less. Still, the health class was cited as the greatest motivator by those who had identified a risky behavior and wished to change! These discrepant findings may be interpreted as yet another example of the oft-noted lack of correspondence between behavior and attitudes or intellectual appraisal of a situation.

Finally, in an attempt to understand the obstacles to making healthful lifestyle changes, the students were asked to list the "biggest" and "second biggest thing" they saw standing in the way of change (Questionnaire item 28). This question was addressed to those students ($n = 52$) who had identified a risky behavior they wanted to change. In analyzing the replies, six categories emerged under which all but a few responses could be

listed. In descending order of frequency, these categories were will power, peers, time, physical limitation, knowledge and drinking. The miscellaneous items which did not fall into these categories were grouped as "other" (see Table 19).

Lack of will power was by far the most frequently mentioned obstacle, both "biggest" and "second biggest". Most examples of lack of will power centered around food, such as "I'm a chocaholic" and "I love food". Such responses were interpreted as implying lack of will power, although not specifically stated as such.

Although quite a few students had credited their peers for motivating them to improve their health, other students saw peers as standing in the way of healthful change. Only one respondent said parents were an obstacle, and one mentioned the "lack of healthy things in the house".

In summary, more female students have tried to change risky lifestyle behaviors and have identified behaviors they want to change than males. These observations correspond to the differences seen between genders in reporting how healthy they believed their present lifestyle to be. Because half of the males only 49% considered their present lifestyle to be "very healthy" or "healthy", they may have seen no need to

Table 19

Obstacles to Changing Risky Behavior Cited by Those
Students Wanting to Change

Category	Biggest Obstacle		Second Biggest Obstacle	
	n	(%)	n	(%)
Will Power	30	(58%)	28	(67%)
Peers	9	(17%)	4	(10%)
Time	5	(10%)	6	(14%)
Physical	3	(6%)	2	(5%)
Knowledge	2	(4%)	1	(2%)
Drinking	2	(4%)	0	(0%)
Other	3	(6%)	1	(2%)

NOTE: Base for percentaging was, for "biggest obstacle",
n = 54; for "second biggest obstacle", n = 44.
Number of "biggest obstacles" cited exceed 52,
since some students cited more than one.

change their lifestyle or appraise the healthiness of their behavior. On the other hand, only 30% of the females considered their lifestyle to be "healthy" or "very healthy" and thus more may be motivated to identify risky behaviors and plan to make healthful changes.

The fact that only four respondents from a potential of 94 HFT participants, with 28 of them identified with either a "possible" or "strong" tendency for disease, cited the HFT program as the catalyst for change, raises doubts as to the program's value. Yet the majority of all subjects in the sample - males, females, participants with or without genetic risk status identified, and even non-participants recommended using the HFT program in future 10th-grade health classes.

Perhaps the HFT program was a greater motivator than respondents were consciously aware of. Throughout the study, HFT participants and teenagers with risk status tended to have more positive attitudes toward the benefits of healthy lifestyle behavior, and exhibited healthier behaviors than non-participants.

Students consistently identified diet and exercise as the risky lifestyle behaviors they wanted to change or had recently tried to change. The greatest obstacles students saw as standing in the way of their changing their behavior were related to their own will power.

This suggests that students as a class recognize the areas of behavioral concerns they need to address, a minority would like or plan to make the appropriate healthful changes, and of those, most realize that they are potentially their own biggest hindrance in their effort to accomplish these goals.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to explore the attitudes of 10th-grade health class students toward their need to adopt positive lifestyle behaviors following participation in a health class focused on disease prevention and health promotion. In that class, students were offered the opportunity to be screened, along with their families, for their genetic predisposition to cancer, cardiovascular disease and diabetes.

A review of the literature revealed that neutral or risky lifestyle behaviors are largely established and solidified during early life. On the premise that healthy lifestyles can decrease mortality and morbidity from chronic disease, it would seem, therefore, that programs focusing on improving adolescent lifestyles would hold the most promise for the future health of the nation.

In the past, adolescent preventive health programs have proven more effective when they have capitalized on the influence of persons and groups whom adolescents wish to please, such as peers, parents and family members. That strategy as an adjunct to classroom instruction can provide continuous reinforcement of educational content,

and thus increase the possibility of permanent behavioral change.

This investigation evaluates a pilot educational program intended to enlist the involvement of parents and peers in order to maximize effects on adolescent health behavior. The program was designed to use multiple approaches on the assumption, derived from the theory of reasoned action, that multiple approaches are more effective than a single approach in imparting knowledge, shaping attitudes or changing behavior. These approaches were classroom instruction, and optional participation in a Family Health Fair and in the "Health Family Tree" (HFT) survey. The curriculum which was required of all students provided instruction on hereditary disease, behavioral risk factors, and interventions to reduce risk. The Family Health Fair was a one-time event conducted at the end of the school year. The HFT survey when completed by the student and family provided a health pedigree questionnaire, which was analyzed for genetic and familial risks for heart disease, cancer and diabetes. Computer-analyzed results were returned to those families so desiring.

This pilot program was offered in 1989-90 to the 202 tenth grade students who were enrolled in either the fall

or spring semester health class of a Southern Oregon high school. All students were exposed to classroom content, only two elected to participate in the Family Health Fair, 95 participated in the HFT survey, and of those, 76 requested return of the computer-analyzed results which identified their genetic predisposition to disease.

To evaluate the health class curriculum and the contribution of the HFT survey to that curriculum, a 33-item questionnaire was administered by the investigator at the end of the school year. A total of 138 health class students (68%) from both semesters completed the questionnaire. The major results of that survey are summarized below.

As a group, the students believed they had learned a moderate amount about healthy lifestyles, and most would recommend the continuation of the program. Students generally appeared to agree that everyone is potentially vulnerable to chronic disease. However, they also believed that people can exercise control over their health, and that a healthy lifestyle can help prevent disease in persons, whether young or old, or with or without a genetic predisposition. Asked to rate their own lifestyles, the modal response was only "somewhat healthy". This rating appears realistic in light of their self-reports regarding their habits. Only a

minority described good nutritional habits, and only a minority engaged in activities to reduce stress. However, a majority did follow healthy guidelines in exercising, and by avoiding tobacco and alcohol. Despite their expressed concern for their health they appeared ambivalent about their need as adolescents to change their behaviors. Perhaps this was because most of them believed their health was good or excellent. In any case, only a minority indicated a desire to change their health practices.

For those who had tried to change, or wished to change, the targeted behaviors were usually diet and exercise. When asked what made them want to change, the health class was most frequently cited, then peers, and then parents. Many volunteered the answer "myself". The HFT program was mentioned infrequently. When asked what were the barriers to change, students blamed themselves (not enough will power), then peers, time, and physical limitations. Peers were seen, then, as both motivating and impeding change. It was interesting to note that although the health class was cited as a major motivator, those teenagers who claimed to have learned a great deal in class were no more inclined to make or contemplate making a change than those who claimed to have learned less.

These, then, were the major findings for the respondents as a group. Some differences were found between HFT participants and non-participants, males and females, and those who had received reports on their genetic risks and those who had not. HFT participants, to a significantly greater degree than non-participants, placed more importance on the information about genetic risks, believed they had learned more, and were more inclined to recommend the course for future classes. They consistently expressed more positive attitudes toward the benefits of healthy lifestyles than non-participants. These findings suggest the possibility that the HFT component was a useful adjunct to the curriculum in raising the consciousness of adolescents regarding their at-risk status. However, these more favorable attitudes have not as yet been translated into action. Their lifestyles did not appear much healthier than those of non-participants, except that slightly fewer drank alcohol and slightly more engaged in stress reduction activities. Although they did not judge their lifestyles to be very healthy, and although they expressed more concern over their health than their counterparts, still to date they have been no more prone to change.

Those students among the participants who had received reports on their genetic risk status did not appear to differ markedly from the other students. Their lifestyles were neither healthier nor riskier. Their concern for health was no greater than that of other participants. However, they did express more desire to change. This may, perhaps, be attributed to their HFT participation.

The females of this sample differed from the males both in that they perceived more benefits in healthy lifestyle behaviors and they practiced healthier habits in all areas examined except smoking. More routinely than males, they selected foods low in fats, abstained from alcohol and used stress reduction techniques. Although they were no more concerned over their health than males, they were more likely to have made lifestyle changes recently, and to express a desire to change.

In conclusion, to answer the questions posed at the beginning of this study, the students recognize their high risk lifestyle behaviors. They acknowledged the importance of their health class content. They did not see the need to modify lifestyle behaviors as limited only to persons with genetic tendencies to chronic disease, or only to adults. However, they are still ambivalent about whether they need to change their

behavior now. Some try to change, and attribute their desire to do so to the health class program. To that extent the program might be considered successful. It is also possible that the program reinforced favorable attitudes in the remaining students toward adopting healthy lifestyles, and that those attitudes may make them more receptive in the future to suggestions to change.

In summary, it appears that incorporating the HFT survey into the existing tenth grade health class curriculum has had a positive and beneficial short-term influence on the majority of students, especially HFT participants. The implications for long-term benefits lie in the positive seeds of behavioral awareness planted by this expanded health curriculum. Hopefully, with time, the positive behavioral perceptions and attitudes noted in those students who delved more deeply into their personal genetic predispositions will lead them to establish positive lifestyle behaviors, thus lessening the likelihood of their contracting chronic diseases later in life as adults.

Given the potential magnitude of the long-term individual and societal benefits, and the positive feedback by students who completed the survey, integrating a pedigree analysis program which involves

student and family collaboration into health education seems to be a proactive step toward better health. To the extent that the program induces adolescents to adopt healthy lifestyle behaviors, those behaviors should translate into cost savings for future generations. An expenditure of \$7.50 per student today may be a very cost effective action from the perspective of tomorrow. Improved levels of wellness in adolescents may be assumed to decrease subsequent health care costs in adults.

Recommendations

While this evaluation indicates that the results of the program have not been spectacular, certain positive aspects should be acknowledged. Thus, this study suggests that both classroom instruction and participation in filling out a genetic health tree along with parents and families did increase the students' awareness of genetic tendencies, and did exert a positive influence on their attitudes toward healthy lifestyle behaviors. Possibly this awareness and these attitudes will lead to beneficial changes in the future. That possibility of a delayed effect might be explored in a follow-up on these students in their senior year.

It is important to recognize that it would be premature to abandon the health class program on the basis of this one evaluation, for two reasons, first,

because of flaws in the evaluation instrument, and second, because of limitations in the implementation of the HFT program. Certain questions in the evaluation instrument were ambiguous, and others probably elicited socially desirable responses. As for the HFT program, the number of parents that actually filled out the Health Tree in conjunction with their child is not known. Also the HFT survey was intended by its developers to be followed up with teaching and counseling for those families found to be at risk, a portion of the HFT program that could not be implemented in this pilot study due to a lack of resources.

Regarding implementation, the program might be enhanced and its effectiveness increased by the following procedures: (1) Along with parental written consent to participate, a written consent should be obtained from the student as well, symbolizing a more mature, responsible commitment on the part of the student to be involved in the process and data outcome. (2) A contract with the nursing faculty at the local college might permit senior BSN nursing students to partially fulfill their public health clinical objectives by making follow-up home visits with consenting families/students who have been identified with "possible" or "strong" genetic tendencies. (3) The 10th-grade health class students

should be involved in organizing, sponsoring and making displays for the "Family Health Fair". Such involvement would be an investment on their parts and would perhaps encourage attendance by family members. (4) A letter should be sent to families at the beginning of each semester explaining the design of the pedigree analysis program, and identifying it as a major educational focus of their child's health class that year. Information should be included concerning date to expect the survey to be sent home, and the importance of the involvement and participation of family members in providing early intervention in genetically transmitted diseases their child may have. Requiring a return signature would further emphasize the significance of the program to parents and students. (5) A block of class instruction dealing with genetics and behaviors should be presented early in the semester so counseling, fairs, etc. could be conducted in a timely and more leisurely manner. (6) Follow-up counseling should be scheduled as soon as possible after families are mailed the computer-analyzed genetic results.

It is commonly assumed that prevention and early detection of certain familially transmitted chronic diseases may be cost-effective in influencing morbidity and mortality in our society (Nora, et.al., 1980; Belloc

& Breslow, 1972; Breslow, 1978). Whether using the HFT tool to accomplish that end is a cost-effective approach to be implemented in all Jackson County high schools is not clear from the results of this study. However, the study does suggest that both classroom instruction and participation in filling out a genetic health tree along with their parents/family, increased students' awareness of genetic tendencies and had a positive influence on their attitudes toward healthy lifestyle behaviors.

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APPENDIX A

Introductory Letter and Consent Form

Phoenix High School

Jerry Stinnett - Principal

Dear Parent or Guardian:

This year at Phoenix High School we will be involved in a Health Family Tree program. It was developed by the Baylor College of Medicine in Houston. The purpose of the Health Family Tree is to show where serious diseases have touched the lives of other family members, identify families who may benefit from services and help researchers gather information. The Health Family Tree will be centered around heart disease, cancer, and diabetes.

We will also have the privilege of having a number of registered nurses in class this year to administer some forms of medical testing. They will be taking blood pressures in class as well as checking blood sugar level and cholesterol levels. This will be done at no charge to you or the district. We will need to prick your child's finger to check cholesterol and blood sugar levels. Therefore, we are required to ask your permission to complete this activity. Your child's grade will not be effected by your response.

- Yes, I would like my child to participate.
- No, I do not want my child to participate.

Sincerely yours,

Joe Dee Hagler

APPENDIX B

Invitation to Family Health Fair

RVMCRogue Valley
Medical Center

May 16, 1989

Dear Parent(s):

The Family Health Assessment Project (co-sponsored by Phoenix High School and Rogue Valley Medical Center) is having a HEALTH FAIR in the small gym of Phoenix High School, from 7-9 p.m., May 24, 1989. The project surveys completed by sophomore students and their families have been analyzed and the results are attached.

THE HEALTH FAIR WILL FEATURE:

- * Information on diabetes, heart disease, stroke, and cancer
- * Explanations of the computerized family history analysis
- * Refreshments
- * Free screenings for cholesterol, blood sugar, blood pressure, and colorectal cancer (1)
- * Recipes and diet information for healthy hearts
- * Risk factor information on exercise, obesity, and smoking

Join us and find out how you can modify your tendency to any of the major diseases.

Thank you for your participation in this project.

Sincerely,

Christine Parfitt, MSW
Community Education Coordinator

CP:ts
Attachment

- (1) Screenings are by appointment. Please call 770-4148 to arrange a convenient time for you and your family members.

APPENDIX C
Letter of Agreement

Phoenix High School
735 N. Rose Street
Phoenix, OR 97535

March 28, 1989

Oregon Health Science University
Department of Community Health Nursing
3181 S.W. Sam Jackson Park Road
Portland, OR 97201

To Whom It May Concern:

Phoenix High School understands and agrees to participate in a research study that is being conducted by Patricia Armstrong, as part of the Family Health Assessment Task Force's pilot study.

It is my understanding that the participation of students in this project is limited to responding to a health behavior appraisal questionnaire and informational questions regarding the Health Family Tree Questionnaire they filled out with their family. Because the study requires only responding to questionnaires, and it is an adjunct to the Health Family Tree study, it does not seem necessary to require a separate parental consent for the study to be conducted and a waiver for such consent seems appropriate.

Respectfully,



Edward Murray
Family Health Assessment Coordinator
for Phoenix High School

APPENDIX D

Family Tree and Health Questionnaire

FAMILY TREE AND HEALTH QUESTIONNAIRE

Please help us evaluate the 10th grade health class by completing this questionnaire. Some of the questions are about the Health Family Tree screening program which was an optional part of the health class this past year. You may remember that the purpose of the program was to identify students with a genetic risk for cancer, heart disease, or diabetes.

Please answer the following questions by checking the response that best applies to you.

1. Did you participate in the Health Family Tree Screening?
 - Yes
 - No
 - Don't know

2. If YES, were you informed that you had a genetic risk for cancer, heart disease or diabetes?
 - No
 - Don't know
 - Yes (specify for which disease) _____

3. If YES, how great is your risk?
 - No apparent risk
 - Possible tendency
 - Strong tendency (marked **** and *** on "Family History Analysis Sheet")

4. Did you attend the evening Family Health Fair in May?
 - Yes
 - No

5. How important was it to you to learn whether or not you have a genetic risk for cancer, heart disease, or diabetes?
 - very important
 - important
 - uncertain
 - not very important
 - not at all important

6. Do you think that learning about your genetic risk for these diseases will be more useful to you when you are older than it is right now?
 - Yes
 - No
 - Uncertain

Any comments?

7. In your health class, how much did you learn about risky "lifestyle behaviors" leading to cancer, heart disease, or diabetes?
- ___ a great deal
 ___ a moderate amount
 ___ some
 ___ very little
 ___ I did not take part in that program
8. Would you recommend using the Health Family Tree program in future tenth-grade health classes?
- ___ Yes
 ___ No
 ___ Uncertain

Any comments?

Part II

Now we would like to ask you about some of your personal opinions and feelings. Please be frank. To answer, circle the number in the column below which best describes how much you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
	↓	↓	↓	↓
How much do you agree that				
9. A person with a high genetic risk for cancer, heart disease or diabetes can avoid getting those diseases by adopting "healthy lifestyle" behaviors.	1	2	3	4
10. It is more important for adults to adopt "health lifestyle" behaviors so as to avoid cancer, heart disease and diabetes than for adolescents.	1	2	3	4
11. "Healthy lifestyle" behavior helps persons <u>without</u> a genetic risk for cancer, heart disease or diabetes to avoid getting those diseases.	1	2	3	4
12. No matter what a person does, if a person is going to get cancer, heart disease or diabetes, he will.	1	2	3	4

How much do you agree that	Strongly Agree	Agree	Disagree	Strongly Disagree
13. Persons <u>without</u> a genetic risk for cancer, heart disease or diabetes are unlikely to get those diseases.	↓ 1	↓ 2	↓ 3	↓ 4
14. Information about "healthy life-style" behavior is more important for students <u>with</u> genetic risks than for other students.	1	2	3	4

Part III

Now we want to ask you a few questions about your lifestyle.

15. How many days in a typical week do you eat breakfast?
- Every day
 5 or 6 days a week
 2 to 4 days a week
 1 day a week or none

16. How many days in a typical week do you eat foods from each of the four food groups?

The four good groups are:

- (1) fruits, vegetables
 (2) bread, grains, and/or cereals
 (3) milk or milk products
 (4) meat, fish, or plant proteins

I eat something from each of these four food groups

- Every day
 5 or 6 days a week
 2 to 4 days a week
 1 day or none

17. How often do you intentionally select foods that are low in fats and cholesterol?
- Daily
 At least three times a week
 Once or twice a week
 Seldom
 Never

18. How often do you intentionally limit the salt in your diet?
 ___ Daily
 ___ At least three times a week
 ___ Once or twice a week
 ___ Seldom
 ___ Never
19. How often do you snack on foods like pastries, candy, sweets, soft drinks, or other sugary foods?
 ___ Daily
 ___ At least three times a week
 ___ Seldom
 ___ Never
20. Aerobic exercise is any physical activity that greatly increases heartrate and breathing. (Aerobics can include exercising, jogging, swimming, jumping rope, cross-country skiing, brisk walking, or other strenuous activities.)
 How often do you get at least 20 minutes of non-stop aerobic exercise?
 ___ Daily
 ___ At least three times a week
 ___ Once or twice a week
 ___ Seldom
 ___ Never
21. How many cigarettes (tobacco) do you smoke?
 ___ None, I have never smoked
 ___ None, I quit smoking
 ___ A pack or less per week
 ___ More than a pack a week, but less than a pack a day
 ___ 1 pack a day
 ___ Between 1 and 2 packs a day
 ___ 2 or more packs a day
22. In a typical week, what is the most alcohol you drink in any one day? (A drink of alcohol is either 12 oz. of beer, 5 oz. of wine, or 1 - 1/2 shot of hard liquor.)
 ___ None, I do not drink
 ___ 1 or 2 drinks in one day
 ___ 3 or 4 drinks in one day
 ___ 5 or 6 drinks in one day
 ___ 7 or 8 drinks in one day
 ___ 9 or 10 drinks in one day
 ___ 11 or more drinks in one day
23. How many times a week do you make an effort to engage in activities to reduce stress in your life? (Activities such as exercise, quiet time by yoursflf, meditation or relaxation?)
 ___ Every day
 ___ 5 or 6 days a week
 ___ 2 to 4 days a week
 ___ 1 day a week or none

24. How healthy do you consider your present lifestyle?
 Very healthy
 Healthy
 Somewhat healthy
 Not very healthy
 Not at all healthy
25. Have you tried to make a "healthy lifestyle" change in your behavior recently?
 No, my lifestyle is healthy
 Yes (Please specify)
26. Have you identified a risky lifestyle behavior of yours that you want to change?
 No
 Yes (What is it?) _____
27. What made you want to change that risky behavior?
 information from the health class
 report from Health Family Tree program
 talking with peers
 advice from your parents
 advice from your doctor
 other (What or who was it?) _____
28. If you have identified a risky lifestyle behavior, what makes it hard for you to change that behavior? Name the two biggest things that stand in the way of your changing.
 Biggest thing _____
 Second biggest thing _____

Part IV

Finally, we would like to ask a few questions about yourself.

29. Are you
 Male
 Female
30. What is your age?
 13 or under
 14
 15
 16
 17
 18 or above (Please specify) _____

31. Do you live with
 Both parents
 One parent
 Guardian
 Grandparent(s)
 Other
32. How much are you concerned about your health?
 Very much
 Quite a lot
 Somewhat
 Not very much
 Not at all
33. How would you rate your health overall?
 Excellent
 Good
 Fair
 Poor

APPENDIX E

Request of Rhode Island Department of Health

190 South Mountain Ave.
Ashland, OR 97520

May 2, 1989

Brian Deery, Ph.D.
Office of Health Promotion
Rhode Island Department of Health
75 Davis Street
Providence, RI 02900-5097

Dear Dr. Deery:

To clarify our telephone conversation, I am a Master in Nursing Science Candidate at the Oregon Health Sciences University in Portland, Oregon. For my master's research project I am engaged in a descriptive study which is designed to explore the attitudes and opinions of tenth grade students who participated in a pilot genetic risk factor study for cancer, heart disease and diabetes. For example, whether or not they feel their genetic tendencies will only be important information to them later in life as adults, and if they feel healthy lifestyle behaviors increase or decrease genetic risks.


In conjunction with assessing their present controllable risk factors such as smoking, exercise and diet, additional information for the study would be valuable and I would like permission to use Questions 10, 11, 12, 18, 20 and 23 from the Teen Wellness Check.

I am more than happy to share the completed tool I am developing for use in my study with you first, and then the results of the study when completed. I will appreciate any help you can give me.

If you would like to verify my study or credentials, my research advisor is:

Mrs. Julia Brown, Ph.D.
The Oregon Health Sciences University
School of Nursing, L343
Department of Community Health
3181 S.W. Sam Jackson Park Rd.
Portland, OR 97201

Sincerely,


Patricia Armstrong

APPENDIX F

Permission from Rhode Island Department of Health



State of Rhode Island and Providence Plantations

Department of Health
CANNON BUILDING
Davis Street
Providence, R.I. 02908

May 16, 1989

Patricia Armstrong
190 South Mountain Avenue
Ashland, Oregon 97520

Dear Ms. Armstrong,

This letter is in response to your request of 5/2/89 to use Questions #10, 11, 12, 18, 20, and 23 from the TEEN WELLNESS CHECK. It is my understanding that these questions are to be used in conjunction with your master's research project, a requirement for your Master in Nursing Science Degree at the Oregon Health Sciences University in Portland, Oregon.

We will allow you to use the requested questions for the purpose you stated. We are very interested in reviewing your completed questionnaire and would also accept your offer of forwarding the results of your study.

We wish you the very best in your academic endeavors and look forward to reviewing your research project.

Respectfully,

Brian E.W. Deery, Ph.D.
Chief of Data Operations
Office of Health Promotion

HEALTH - A WAY OF LIFE

APPENDIX G

Computerized Family History Analysis

INTRODUCTION AND EXPLANATION

Your Health Family Tree Questionnaire has been analyzed by a computer program developed at the University of Utah Cardiovascular Genetics Clinic. Your Health Family Tree was compared to similar information from thousands of other families. If you have questions concerning these results, please call

This family history interpretation can help your physician evaluate possible disease tendencies in your family. Please show it to your doctor at your next visit. It is not a substitute for your doctor's sound medical advice.

This interpretation could be wrong if your answers about relatives were inaccurate or if errors occurred during computer input. PLEASE REVIEW THE DESCRIPTION OF EACH RELATIVE IN THE FAMILY DIAGRAM AT THE END OF THIS REPORT TO SEE IF IT AGREES WITH YOUR HANDWRITTEN QUESTIONNAIRE.

HOW YOUR FAMILY HISTORY COMPARES WITH OTHERS:

This Family History analysis compares the occurrence of diseases and risk factors in your family to thousands of other families. We calculate the degree that diseases tend to run in your family by seeing if the number of family members with specific diseases or risk factors was more than expected in the general population. The number of your relatives and their age and sex are taken into account to make the comparison as accurate as possible. If age or sex information is missing, the person is excluded from the calculations.

The diagram below shows how your family history compares with others. Family disease tendency is rated on a scale from average to high as indicated by the "X" below.

There were not enough individuals in appropriate age groups among females in your father's family to make a valid family history comparison.

FAMILY TENDENCY FOR DISEASES AND RISK FACTORS:

Family #88801909.	IN MOTHER'S FAMILY			IN FATHER'S FAMILY		
	IN MALES Avg High	IN FEMALES Avg High	IN BOTH SEXES Avg High	IN MALES Avg High	IN FEMALES Avg High	IN BOTH SEXES Avg High
CORONARY HEART DISEASE	--X--	--X--	---X---	--X--	---	---X---
HEART ATTACK	--X--	--X--	---X---	--X--	---	---X---
ANGINA	--X--	--X--	---X---	--X--	---	---X---
BYPASS SURGERY	--X--	--X--	---X---	--X--	---	---X---
STROKE	--X--	--X--	---X---	--X--	---	---X---
BREAST CANCER	--X--	--X--	---X---	--X--	---	---X---
LUNG CANCER	--X--	--X--	---X---	--X--	---	---X---
COLON CANCER	--X--	--X--	---X---	--X--	---	---X---
OTHER CANCER	--X--	--X--	---X---	--X--	---	---X---
HIGH BLOOD PRESSURE	--X--	--X--	---X---	--X--	---	---X---
HIGH CHOLESTEROL	--X--	--X--	---X---	--X--	---	---X---
DIABETES	--X--	--X--	---X---	--X--	---	---X---
SMOKING	--X--	--X--	---X---	--X--	---	---X---
MARKEDLY OVERWEIGHT	--X--	--X--	---X---	--X--	---	---X---
LACK OF EXERCISE	--X--	--X--	---X---	--X--	---	---X---

The following disease and risk factor information was used in this family history analysis. Since these are basically chronic diseases affecting adults, tabulations are based only on diseases occurring after age 20.

There is 1 person with CORONARY HEART DISEASE (Heart attack or Coronary bypass) in your father's family (1 Female at an average age). (Possible family tendency)

There is 1 person with CORONARY HEART DISEASE (Heart attack or Coronary bypass) in your mother's family (1 Male at an average age). (Possible family tendency)

There is 1 person with OTHER CANCER in your mother's family (1 Male). (No apparent family tendency)

There is 1 person with HIGH BLOOD PRESSURE in your father's family (1 Female at an average age). (Possible family tendency)

There is 1 person with HIGH BLOOD PRESSURE in your mother's family (1 Female at an early age). (Possible family tendency)

There is 1 person with HIGH CHOLESTEROL in your father's family (1 Female). (Possible family tendency)

There is 1 person with HIGH CHOLESTEROL in your mother's family (1 Female). (Possible family tendency)

There are 2 persons SMOKING in your father's family. (Strong family clustering)

There are 4 persons SMOKING in your mother's family. (Strong family clustering)

There is 1 person MARKEDLY OVERWEIGHT in your father's family. (Possible family tendency)

There are 2 persons with LACK OF EXERCISE in your father's family.

There are 3 persons with LACK OF EXERCISE in your mother's family.

DISEASES WITH APPARENT STRONG TENDENCY IN YOUR FAMILY

There are no diseases which show an increased tendency in your family.

DISEASES WITH POSSIBLE TENDENCY IN YOUR FAMILY

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CORONARY HEART DISEASE: Coronary heart disease results from atherosclerotic blockages to the arteries that carry blood to the heart muscle. It may cause intermittent chest pains known as "ANGINA PECTORIS" or may be detected by tests and result in CORONARY BYPASS SURGERY. It often causes a HEART ATTACK that leads to several days of hospitalization or death.

There appears to be a possible increased tendency toward coronary heart disease in your family. Show this evaluation to your doctor at your next visit and ask if you should pay special attention to any of the coronary risk factors.

HIGH BLOOD PRESSURE: There appears to be a possible tendency toward high blood pressure in your family. Measurements of blood pressure should be done at least once a year for you and your relatives.

HIGH CHOLESTEROL: According to your questionnaire, high blood cholesterol has been reported in your family. Since this does tend to run in families it would be good to have your blood cholesterol levels checked. You may want to discuss this further with your physician. You might also want to discuss this with relatives to see if others have high blood cholesterol.

DISEASES WITH NO APPARENT TENDENCY IN YOUR FAMILY

These diseases do NOT show any apparent increased tendency in your family: STROKE, BREAST CANCER, LUNG CANCER, COLON CANCER, OTHER CANCER, DIABETES. Even without family tendency the following statements give good advice.

LUNG CANCER: There is no evidence of a family tendency toward lung cancer in your family. Since cigarette smoking alone certainly seems to be able to cause lung cancer it should be avoided by everyone, even in the absence of a family lung cancer tendency.

SUMMARY OF DISEASE RISK FACTORS

SMOKING: **** There are more smokers in your family than in most families in the general population. Scientists suspect that some family tendencies toward diseases may, in fact, be due to shared family life-styles such as cigarette smoking. Members of your family who smoke should be encouraged to stop smoking and also to discuss the potential health hazards of smoking with their personal physician and other health professionals. Early heart ...CONTINUED in left column of next page...

attacks, lung cancer, chronic lung diseases, and a variety of other illnesses are all attributable to cigarette smoking. THOSE WHO SMOKE IN YOUR FAMILY SHOULD BE STRONGLY URGED TO STOP SMOKING, especially if any of these diseases also tend to run in your family.

MARKEDLY OVERWEIGHT: There is some tendency toward marked obesity in your family. While this is a difficult problem to deal with, it is worth discussing with your physician or other health professionals. Family members wishing to lose weight should be encouraged to do so through diet and exercise.

LACK OF EXERCISE: Regular, vigorous exercise is recommended by many physicians to help prevent heart attacks and to help improve a person's physical and psychological sense of well being. Brisk walking, jogging, bicycling, swimming, and regular participation in competitive sports are examples of vigorous exercises that are called "aerobic" and are probably quite healthful.

**** Your relatives have vigorous exercise much less often than average when compared to other families. You and other close relatives may want to discuss the possible benefits of physical exercise with your physician at your next routine examination.

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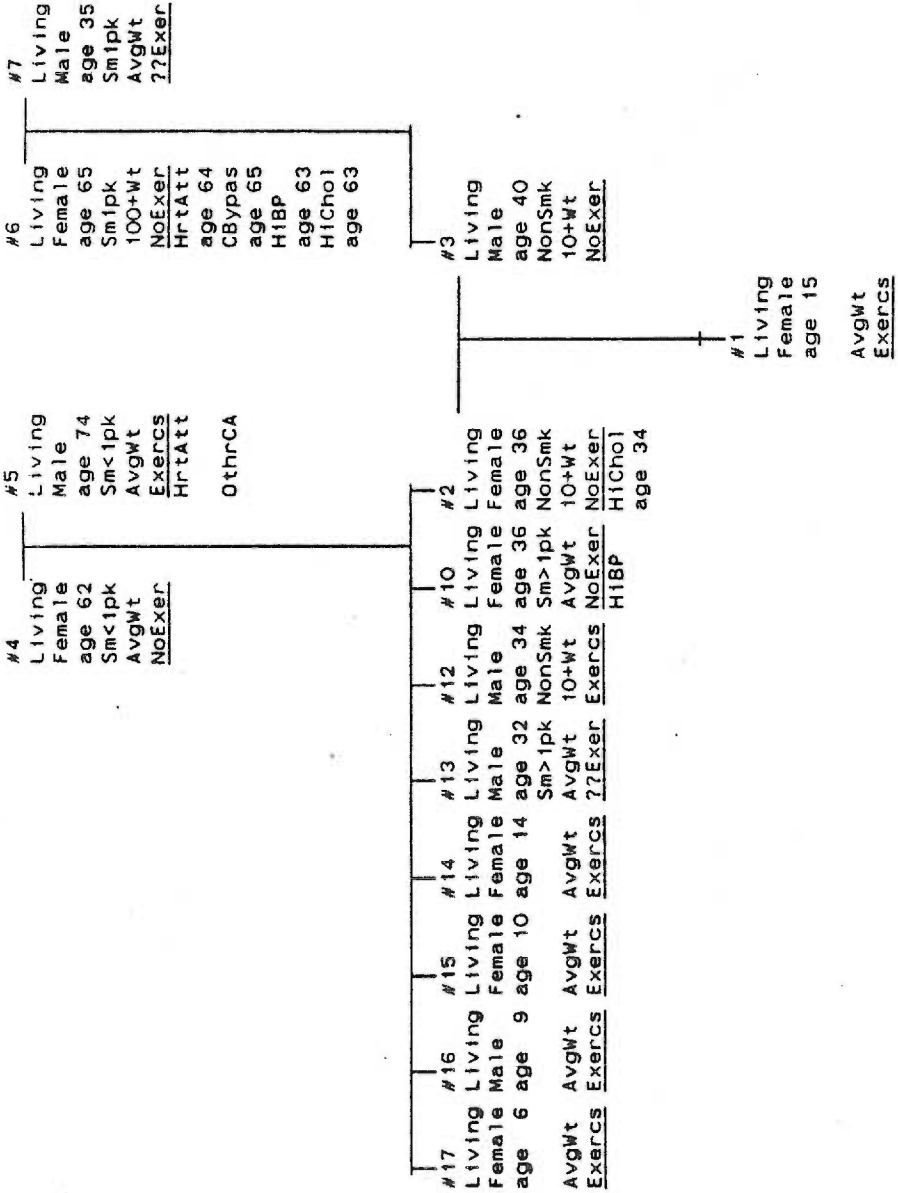
KEY TO HEALTH FAMILY TREE DIAGRAM (on following page)
 THE FOLLOWING DATA ITEMS ARE DISPLAYED FOR EACH MEMBER OF THE FAMILY TREE.
 INFORMATION IS LISTED IN THE FOLLOWING ORDER USING THE ABBREVIATIONS SHOWN:

1. PERSON NUMBER as listed on the Health Family Tree questionnaire
2. LIVING? "Living" or "Dead"
3. SEX: "Male" or "Female"
4. AGE OR AGE AT DEATH
5. SMOKING STATUS: Non-smoker="NonSmk", Smoker="Smoker", Ex-smoker = "ExSmkr"
 Smokers: under 1 pack/day="Sm<1pk", 1 pack="Sm1pk", over 1 pack="Sm>1pk"
 Exsmokers: under 1 pack/day="Ex<1pk", 1 pack="Ex1pk", over 1 pack="Ex>1pk"
6. WEIGHT: Average weight = "Avgwt", 10-49 lbs over = "10+wt", 50-100lbs over = "50+wt", 100+ lbs over = "100+wt"
7. REGULAR EXERCISE: Yes = "Exercs", No = "NoExer"
8. DISEASE ABBREVIATION and AGE AT ONSET OF DISEASE for each disease present

DISEASE ABBREVIATIONS

HEART ATTACK: HrtAtt
 ANGINA: Angina
 CORONARY BYPASS SURGERY: CBypas
 STROKE: Stroke
 BREAST CANCER: BrstCA
 LUNG CANCER: LungCA
 COLON CANCER: ColnCA
 OTHER CANCER: OthrCA
 HIGH BLOOD PRESSURE: HiBP
 HIGH CHOLESTEROL: HiChol
 DIABETES: Diabts

Data Errors have been detected
Please check the data carefully
Invalid relative numbers are
shown on the following page



The following data is for individuals that were submitted with missing, or invalid relative numbers and were excluded from the calculations. By looking at the disease information for relatives that may have been improperly excluded from

your family you can get some idea of how your calculated risk of disease may have been affected.

For a description of the following data, see the "Key to Health Family Tree" on a previous page.

#0	#8	#9
Living	Living	Living
Male	Male	Male
age 43	age 37	age 39
Sm1pk	NonSmk	Sm<1pk
50+Wt	50+Wt	50+Wt
NoExer	??Exer	??Exer
HrtAtt		
age 42		
CBypas		
age 42		
H1BP		
age 38		
H1Chol		
age 38		

APPENDIX H

Family Tree and Health Questionnaire Written Responses

Tan Questionnaires - Fall Written Responses

Question 2 If YES, were you informed that you had a genetic risk for cancer, heart disease or diabetes?

Yes - Breast Cancer

Cancer

Heart disease and diabetes

Cancer and diabetes

Cancer

Diabetes

Heart disease

All

Question 6 Do you think that learning about your genetic risk for these diseases will be more useful to you when you are older than it is right now?

Any comments?

I think it's important because if you do, it is nice to know so you can start preventive measures if there are any.

The sooner you know the better the chances to cure the problem.

Can try to avoid it by doing certain things.

I wasn't able to participate in the Family Tree because we could get no info on my Dad's side of the family.

I think that everyone should do this.

Question 8 Would you recommend using the Health Family Tree program in future tenth-grade health classes?

Any comments?

Good idea!

I don't think anyone cares.

It's kind of fun too, to learn how you can help yourself from getting any disease.

Question 25 Have you tried to make a "healthy lifestyle" change in your behavior recently?

Yes. Keep a positive attitude.

Yes. My dad was a borderline diabetic so we changed our eating habits and got into exercising.

Yes. I try to get more exercise and eat breakfast.

Yes. Tried exercise program. Quit due to lack of time.

No. I haven't tried, but it's not healthy.

Yes. Eat better.

Yes. Started eating "square" meals including breakfast.

Yes. More exercise - eat right.

No. I like the way I am.

Yes. Eat better, exercise more.

Yes. Exercise.

Yes. I've started to exercise more.

Yes. Work out every day. No junk food.

Yes. Lift weights and be active.

Question 26 Have you identified a risky lifestyle behavior of yours that you want to change?

Yes - Chewing

Yes - I eat too many high cholesterol foods.

Yes - Chewing

Yes - To get more exercise and eat breakfast.

Yes - All the sugary food.

Yes - My eating habits.

Yes - To be on more of a routine.

Yes - Exercise more.

Yes - No exercise.

Yes - Nutrition.

Yes - I eat bad things.

Yes - Not eating breakfast.

Yes - Snacking.

Yes - Boyfriend.

Yes - No enough exercise and I need to eat more often and cut down on junk food.

Yes - Eating too much cholesterol and no breakfast.

Yes - Stop eating sugary food.

Yes - Unhealthy diet.

Yes - Getting fat.

Yes - To quit chewing Copenhagen.

Yes - Eating too much candy.

Yes - Stay healthy.

Question 27 What made you want to change that risky behavior?

Other: Don't want to gain weight.

My own feelngs.

Myself.

Myself.

I want to.

Fear of getting disease or gaining weight.

With myself.

The way I felt, tired, etc.

Question 28 If you have identified a risky lifestyle behavior, what makes it hard for you to change that behavior? Name the two biggest things that stand in the way of your changing.

Biggest thing: Friends

Asthma

It's hard to stay away from sweets.

Insecure

My present routine.

Lack of time.

No way of knowing what's right.

I love junk food.

Food

Don't have the willpower.

Time

Habit

My parents.

Don't have enough time to eat breakfast.

I don't eat a whole lot, but it's still too much.

Hungry for certain food.

I love food.

Peer pressure.

Friends do it so it's hard to quit.

Me, I don't want to.

Lazy, too much work.

Drinking

Not eat junk food.

Second biggest thing: Too easy to get.

Power to do it.

It's hard to stay on a good steady diet.

Not enough energy.

No control.

Time

Lack of time.

I eat when depressed and I get depressed a lot.

Time

Too lazy or too busy to eat breakfast or make any meal.

Willpower

My friends always eat junk food and it's hard not to when they're always around you.

I like to eat.

Don't know what foods are high in cholesterol.

I like these foods.

No enough healthy things in house.

Craving

I enjoy it.

Friends

Time

Take any dare that's given.

Running or take aerobic classes.

White Questionnaires - Spring Written Responses

Question 2 If YES, were you informed that you had a genetic risk for cancer, heart disease or diabetes?

Yes - High blood pressure.

High blood pressure - cholesterol.

All.

Heart Disease.

Cancer, heart disease.

Overweight.

Diabetes.

Heart Disease.

Diabetes.

Breast Cancer.

Possibly cancer.

Heart disease/diabetes.

Breast Cancer.

Cancer.

Cancer.

Heart Disease.

Question 6 Do you think that learning about your genetic risk for these diseases will be more useful to you when you are older than it is right now?

Any comments?

Elvis lives!

I figured I would because my grandparents have one or the other.

I already knew I had a risk for diabetes.

I was upset at the cholesterol level. It made me stop and think - which is a lot more than my dad ever did.

It's better to know now.

I'm not sure I'd like to know about my genetic risk for cancer because I'm a paranoid person!

I already know what I am or might contract genetically.

I didn't participate in the exercise.

Came to class but did not do it.

Question 8 Would you recommend using the Health Family Tree program in future tenth-grade health classes?

Any comments?

The nurse gave me a lot of information and made me more concerned.

Depends on if people care.

Satan lives!

The results just said exactly what we sent in.

It's very accurate.

Helps people learn about diseases in family.

Good idea.

It won't work if parents won't let their kids participate in it.

I thought it was very informative.

Question 25 Have you tried to make a "healthy lifestyle" change in your behavior recently?

Yes. Working out, running, eat better.

Yes. I don't try!

No. My lifestyle isn't that healthy, but I like it.

Yes. More exercise.

Yes. Eating less fats - no fried foods, eating oat bran for cholesterol help. Less sugars, diet soda.

- Yes. I tried to exercise more by being in track then the season ended. I try to eat a healthy breakfast.
- Yes. Eat salad and potatoes without dressing and do not use salt.
- Yes. I've been trying to drink 8 glasses of water a day, eat better and exercise more.
- Yes. Exercising more and eating better.
- Yes. Dieting.
- Yes. Exercise and eating better.
- Yes. Eating better, more exercise.
- Yes. Eating right like all the four food groups and losing weight.
- Yes. I'm trying to become a body builder.

Question 26 Have you identified a risky lifestyle behavior of yours that you want to change?

Yes - Stop drinking beer and eating better.

Exercise more.

Too much salt.

Losing weight, lessening salt.

Less cholesterol.

Too much salt, sugar, fat.

Drinking.

Bad eating/little exercise.

Lack of exercise.

Exercise more. Eat less junk food.

Stop drinking pop all the time.

Don't eat so much sugar.

Eat less snacks and more balanced meals.

Eating chocolate and bingeing.

Not eat so much junk food.

Smoking.

Overeating.

My eating and exercise habits.

Health.

Smoking.

Eating a lot of fatty foods.

Salt and fats - small amounts of exercise.

Too much alcohol.

Question 27 What made you want to change that risky behavior?

Other: High blood pressure.

Myself.

I did it on my own advise.

Tired of getting in trouble.

Gain weight.

Myself, I like food better plain anyway.

Myself.

Modeling classes.

Knowing you can die from it.

I'm fat.

Girlfriend.

TV.

Getting sick.

Question 28 If you have identified a risky lifestyle behavior, what makes it hard for you to change that behavior? Name the two biggest things that stand in the way of your changing.

Biggest thing: Friends.

I feel sick without it.

Being able to stick with it.

Cholesterol.

I like candy, pastries, salty things.

Like to drink beer.

Habit.

Hangover.

Temptation.

Time; no one near to exercise with.

No time.

I enjoy life (Fun!)

I like to drink pop, and alcohol some times.

Used to it.

Habit.

Lifestyle.

I'm a chocaholic, I love food.

The food tastes so good.

It's fun - gives me something to do.

Peer pressure.

Myself.

I hate dieting.

Stress.

Addiction.

Styles of food I eat.

Not wanting to put out the effort.

Friends.

Friends.

Cancer, smoking.

The craving for candy.

Work.

Friends.

Second biggest thing: I want to do it.

It tastes good.

Peers.

Don't want to.

Overdose.

No self-control.

I'm lazy.

I feel like I deserve to rest after
a hard day.

Money.

I rely on pop to cool me down in
summer.

Like doing it.

Friends and myself.

I'm reasonably thin, so I don't worry
as much.

You only live once.

Addicted - life is boring without it
there's nothing to look forward to.

Other influence.

Eating habits.

Boredom.

No time.

Having fun.

Stroke, smoking.

Eating all the four food groups.

The desire to drink and party.

APPENDIX I

Mean Scores by Gender to Questionnaire Items Relating
to Benefits of Healthy Lifestyle Behaviors

Mean Scores for Questionnaire Items Relating to Benefits
of Healthy Lifestyle Behaviors by HFT Participation,
Gender and Identified Genetic Risk

Questionnaire a Item	HFT Non-	HFT	Identified Risk		
	Participants	Participants	No Apparent	Possible	Strong
	M = 28	M = 47	M = 10	M = 8	M = 3
	F = 15	F = 47	F = 7	F = 12	F = 5
9-Healthy life- style useful for persons at genetic risk	M 2.02 F 1.74	M 2.11 F 1.80	M 1.50 F 1.86	M 2.25 F 1.67	M 2.30 F 1.40
10-Healthy life- style more im- portant for adults	M 2.51 F 2.85	M 2.25 F 2.67	M 2.40 F 2.57	M 2.75 F 2.67	M 2.90 F 3.20
11-Healthy life- style useful for persons not at genetic risk	M 1.98 F 1.70	M 2.14 F 1.33	M 1.80 F 1.71	M 2.13 F 1.83	M 1.90 F 1.60
12-Nothing can be done to prevent	M 2.89 F 2.83	M 2.57 F 2.73	M 3.00 F 2.43	M 3.13 F 2.83	M 2.90 F 3.00
13-Unlikely to get disease if no genetic risk	M 2.83 F 2.94	M 2.43 F 3.00	M 3.10 F 2.71	M 2.75 F 2.83	M 2.90 F 3.00
14-Information more important for persons with genetic risk	M 2.49 F 2.55	M 2.14 F 2.80	M 2.50 F 2.86	M 2.38 F 2.58	M 2.60 F 2.80

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 All items were scored from 1 ("strongly agree") to 4 ("strongly disagree"). Items 9 and 11 are positive. Items 10 through 14 are negative.

ABSTRACT

Title: Assessment of the Health Class Curriculum of an
Oregon High School

Author: Patricia J.H. Armstrong

APPROVED: _____

Julia S. Brown, PhD, Thesis Advisor

The purpose of this investigation was to evaluate the educational program of a 10th-grade health class curriculum focused on disease prevention and health promotion. The program was designed to use multiple approaches and to enlist the cooperation of parents in order to maximize the promotion of healthy lifestyle behaviors among adolescents. In addition to classroom instruction in behavioral risk factors, students and their families were offered the opportunity to participate in a Family Health Fair, and in the Health Family Tree (HFT) survey. That survey identifies an individual's predisposing familial tendencies for diabetes, cardiovascular disease and some cancers.

Only two of the 202 students enrolled in the health class in 1988-9 attended the Family Health Fair. However, 95 completed the HFT survey at home with their

families, and returned it to be analyzed. Of those, 95, 76 requested and received the computer analysis of their genetic risk for the specified diseases.

To evaluate this innovative health class, a 33-item questionnaire was administered to all 10th-grade students present in school on a specific day. The sample consisted of 138 students, 15-16 years old, enrolled in a rural, middle class, predominantly white, public high school. The questionnaire elicited student opinions about health class content, their perceptions of the benefits of healthy lifestyle behaviors, self-reported lifestyle behaviors, and attitudes toward changing risky lifestyle behaviors. Comparisons were made between the 75 males and 63 females, between the 94 students who had participated and the 43 who had not participated in the HFT segments of the health class, and between the 45 HFT participants who had received computerized printouts of their genetic risks and the 49 participants who had not.

The majority of students in this sample believed the health class content was important, and that they had learned a "moderate" to "great deal" about risky lifestyle behaviors. Most would recommend continuation of the program. Students generally agreed that anyone might contract chronic disease, even persons with no particular genetic risk. However, they believed that

people can control their health or illness to some extent. Most agreed that adopting healthy lifestyle behaviors could help anyone avoid disease, but it was especially important for those at genetic risk. Female students had significantly more positive perceptions of the benefits to be derived from adopting healthy lifestyle behaviors than males. HFT participants to a greater extent than non-participants believed personal genetic risk information was important (Chi-square = 21.69, $p < .0002$), and were more likely to recommend incorporating the HFT program into the future 10th-grade health class curriculum (Chi-square = 9.60, $p < .008$).

With regard to their present lifestyles, only a minority described good nutritional habits, and only a minority engaged in activities to reduce stress. A majority, however, reported healthy behavior in exercising, and in avoiding smoking and alcohol. Females more frequently than males chose low cholesterol and low fat foods (Chi-square = 3.33, $p < .05$), were less likely to drink alcohol (Chi-square = 13.17, $< .001$), and practiced stress reducing activities more frequently (Chi-square = 3.93, $p < .05$). HFT participants drank less than non-participants (Chi-square = 5.18, $< .03$) and practiced stress reducing activities more regularly (Chi-square = 5.42, $p < .05$).

Most respondents considered their present lifestyle to be only "somewhat" healthy, and were concerned "quite a lot" about their health. However, only a minority expressed a desire to change their health practices, perhaps because most considered their overall health to be "good" or "excellent". For those who had tried to change, or wished to change, the targeted behaviors were usually diet and exercise. Most of the respondents cited the health class as their principal motivator for having changed or wanting to change risky behavior. They overwhelmingly identified lack of willpower as the major impediment to change. Female respondents to a significantly greater degree than males reported having made a lifestyle change recently (Chi-square = 5.40, $p < .02$), or having targeted a risky behavior they wanted to change in the future (Chi-square = 10.67, $< .001$). Respondents with an identified genetic predisposition for disease did not differ markedly from the other students, other than in the fact that they reported a greater desire to change risky behaviors (Chi-square = 6.88, $< .01$).

This study is limited in generalizability because of the nature of its sample, but it does suggest that both classroom instruction on behavioral risk factors and

participation in a survey to determine genetic tendencies for disease had a positive influence on adolescents' attitudes toward healthy lifestyle behaviors. However, the effectiveness of this particular curriculum in translating positive attitudes into behavior was limited. In order to enhance the effectiveness of future class programs, a number of specific recommendations are made which would increase the active involvement of students and their families in planning and carrying out the program.