DEVELOPMENT AND VALIDATION
OF A SELF-SCORING TEST
FOR CORONARY HEART
DISEASE RISK

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ABSTRACT: Self-administered tests to assess an individual's coronary heart disease risk are common in the popular press. However, delusion and inaccuracy in self-scoring may impair their utility as educational tools. Self-assessment questions concerning dietary cholesterol, weight, cigarette smoking, and blood pressure were administered several days prior to risk measurement to 246 randomly selected adults aged twenty-five to sixty-four. A standard risk score combining measured blood pressure, cigarette smoking on blood cholesterol level was calculated for each participant using a multiple logistic equation. The self-scoring test was derived by multiple regression, using the standard risk score as the dependent variables and the self-assessment responses, age, and sex as independent variables. The multiple R² of the resulting equation was 0.48. For 86 percent of the participants, the decile of self-assessed risk was within two deciles of the decile of risk calculated from logistic equation. We tested the validity of the self-scoring test in a separate and independent population (n=247) with comparable results. We conclude that the test indicated risk status and sources of elevated risk for many individuals. Such a test can be a valid health education tool.

INTRODUCTION

A self-scored test for coronary heart disease risk is desirable as a public health education tool. Such tests are familiar to the public from newspapers, popular magazines, and television. The individual answers questions about personal characteristics, knowledge, and habits and adds up the assigned points. The total score provides an estimate of personal risk. These tests actively involve the individual as they present information.

Several such tests have been developed for public use.¹ ² However, before they can be used as educational tools, several questions need to be addressed:

1. Is the educational message conveyed by the tests appropriate?
2. Can the test be used by both sexes and all ages?
3. Will many individuals taking the test seriously misclassify themselves by failing to answer candidly?
4. Is the resulting score a realistic measure of heart disease risk?

This report documents the development and evaluation of a self-scoring risk test for heart disease by comparing people’s responses to a series of self-evaluation questions to risk based on subsequent physical measurements.

**METHODS**

**Population**

Ten self-evaluation questions were asked during interviews of residents in two small towns in Minnesota, Montevideo and Pipestone. Each town has a population of about 5,000. Households were selected by a random process, and from each household one age-eligible adult (between twenty-five and sixty-four years) was randomly selected for interview and a subsequent survey examination. Following the home interview, the respondent was invited to attend a nearby survey center where blood was drawn for serum cholestrol and thiocyanate measurement. Blood pressure and height and weight were measured. The final sample size achieved in the project was 251 in Montevideo and 252 in Pipestone; of these, 246 in Montevideo and 247 in Pipestone provided complete data used in the current analysis. Participation rates were high in each area (90 percent) for the randomly selected population-based sample. The demographic characteristics of the sample are shown in Table 1.

**Self-Assessment Test**

The self-evaluation section of the survey included questions on cigarette smoking, dietary cholestrol and fat intake, weight, family history of heart disease, blood pressure history, physical activity habits, salt use, age, and sex. Each question was multiple-choice in format. These questions and their responses are shown in the Appendix.

**Physiological Measures**

Physiological measures were made after the self-evaluation questions were answered and included serum total cholestrol, serum thiocyanate, height, weight, and blood pressure.

Serum cholestrol was measured on nonfasting blood serum by techniques described in detail elsewhere (Technicon Autoanalyzer II). The laboratory is a Lipid Research Clinic (LRC) reference laboratory and is part of the quality control program of the Center of Disease Control (CDC).