Computer-assisted telephone interview (CATI) in primary care

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**Objectives.** We aimed to study the prevalence of cardiovascular disease (CVD) risk factors among 11 000 inhabitants in Northern Helsinki, and to identify high-risk individuals in the area and direct them to the local primary-health-care-centred CVD-risk-factor prevention programme.

**Method.** We conducted a computer-assisted telephone interview (CATI), a descriptive survey and primary care unit searching for CVD risk factors within the population under its responsibility. Six hundred and sixty-seven individuals aged 18–65 years out of 1000 randomly chosen inhabitants were interviewed using CATI. We measured the prevalence of self-reported CVD risk factors: smoking, blood pressure, last measured total serum cholesterol, body mass index (BMI), alcohol consumption, diabetes, physical exercise habits, positive family history of CVD/diabetes and personal history of CVD.

**Results.** Sixty-seven per cent of the sample was interviewed. Nineteen per cent did not have a telephone and 3% refused to be interviewed. Eleven per cent did not respond. Persons with high cardiovascular risk scores were observed mainly in the oldest age group. In the total sample, 23% of women and 28% of men were estimated to be at high risk of coronary artery disease. Gender differences were seen only in one age-group: 45–54-year-old men reporting higher risk-factor scores. The results were analysed using the Statistical Analysis System (SAS).

**Conclusions.** The CATI-method is a useful tool in screening of high-CVD-risk patients and in guiding them to local CVD primary prevention programmes.

**Keywords.** Cardiovascular diseases, computer-assisted telephone interview, prevention, primary health care, risk factors.

Introduction

The computer-assisted telephone interview (CATI) is an interview method used mainly in lifestyle analyses in social sciences and increasingly also in health care. CATI has been used for interviews with both professionals and general populations. CATI enables one to reach a high number of subjects, and to record the answers instantly, minimizing errors of recording. It also simplifies the handling of collected data.

In comparison with face-to-face interviews and mailed questionnaires, CATI generally yields higher participation rates and is considered to be cheaper. In one study, CATI was estimated to be more expensive than face-to-face questionnaires, but the pre-interview costs and data handling were not considered and accounted for. Time and cost expenditures of CATI have been analysed. It was found that evenings were the most productive time for interviewing, and the actual time spent interviewing was about half of the total time devoted to conducting the interviews. CATI has been recommended as a suitable and efficient method for data collection in primary care research.

Life-style patterns are major risk factors for cardiovascular disease (CVD). Primary prevention is hampered by difficulties in finding subjects with multiple risk factors. The sensitivity of self-reported hypertension, hypercholesterolaemia, obesity, smoking and diabetes have been in the range of 43–82%. The specificity of self-reports for all risk factors except hypercholesterolaemia was over 85%. However, telephone interviews may lead to an underestimation of smoking rates, particularly among adolescents.

For primary prevention studies it is necessary to detect persons at risk of CVD in the population. Furthermore, it is important to determine the reasons why some individuals do not use the services provided by local
primary health care. CATI was considered to be one possible means of reaching a representative sample of the population and of giving an answer to both of these questions.

Materials and methods

In Finland, most municipal primary health care is arranged using an area-based list system where one GP and his multiprofessional team have the responsibility for 1800–2500 inhabitants. CATI was used to collect data on CVD risk-factor profiles and the use of health services in a suburban area of 11 000 inhabitants in the northern part of Helsinki, Finland. One thousand adults (18–65 year olds) were randomly chosen by the Population Register Centre. The telephone interview was preceded by a personal introductory letter informing about the interview, its contents and its use in developing a CVD prevention programme in the area. Five interviewers familiar with the CATI technique were coached. An average interview lasted approximately 13 minutes.

The questions included the presence of known CVD risk factors, i.e. last measured blood pressure level and serum cholesterol levels, weight and height, physical exercise habits, subjective physical condition in comparison with people of the same age, (family) history of CVD and/or diabetes, smoking and alcohol intake habits. The amount of alcohol that was considered excessive was over 4 units/session (one unit = 120 ml wine, 40 ml liquor or 330 ml beer). Background demographic data and the use of public primary care services were also enquired about. The interest in participating in a planned primary care preventive CVD programme was checked in case the survey identified high CVD-risk-factor scores.

The CVD-risk-factor scores (Table 1) were calculated based on a modified method described by the Finnish Heart Association. People were considered to be at high risk if their total score was 4.5 or over. This score was used to activate the health centre for an individual intervention programme. Data were analysed for chi-square, Fisher’s exact t-test and logistic regressions using the SAS-system.

The study was approved by the Ethical Committee of Helsinki City Health Care and Population Register Centre.

Results

Of the 1000 randomly chosen individuals, 19% did not have a telephone, 3% refused to be interviewed and 11% could not be reached for reasons such as travelling, illness or business. During a 3-week period in January 1996, with at least three attempts 667 persons (67%) were successfully interviewed. Excluding those without an available telephone number, 82% were interviewed; 81.8% of the interviewed people were employed, and 34.5% were in administrative or clerical work, 20.4% in technical, social science or artistic work, 13.9% in social and health care, and 13.0% in commercial work. The unemployment rate was 4.6%. Ten per cent of the sample were retired. The rest were studying or staying home for some other reason.

Fifty-seven (25%) women and 45 (23%) men reported the presence of CVD. Of these, 59% of women and 54% of men used public primary care services. The number of ‘total’ non-users of primary health care services was low, i.e. two women (0.9%) and six men (3.1%). Among inhabitants with CVD, a small number, 3.5% of women and 13.3% of men, reported to be non-users of any primary health care services. Furthermore, people who considered themselves being in poor health used municipal health care centres more than they used

<table>
<thead>
<tr>
<th>Score</th>
<th>BMI kg/m²</th>
<th>Current smoking</th>
<th>Physical exercise</th>
<th>Systolic BP mmHg</th>
<th>Diastolic BP mmHg</th>
<th>Cholesterol mmol/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>≤24.9</td>
<td>0</td>
<td>≥3×/week</td>
<td>≤129</td>
<td>≤79</td>
<td>≤4.9</td>
</tr>
<tr>
<td>0.5</td>
<td>25–26.9</td>
<td>occasionally</td>
<td>1–2×/week</td>
<td>130–139</td>
<td>80–89</td>
<td>5.0–5.4</td>
</tr>
<tr>
<td>1.0</td>
<td>27–28.9</td>
<td>1–4/day</td>
<td>app 1×/week</td>
<td>140–149</td>
<td>90–94</td>
<td>5.5–5.9</td>
</tr>
<tr>
<td>1.5</td>
<td>29–30.9</td>
<td>5–9</td>
<td>sometimes</td>
<td>150–159</td>
<td>95–99</td>
<td>6.0–6.4</td>
</tr>
<tr>
<td>2.0</td>
<td>≥31</td>
<td>10–14</td>
<td>never</td>
<td>≥160</td>
<td>≥100</td>
<td>6.5–6.9</td>
</tr>
<tr>
<td>2.5</td>
<td>–</td>
<td>15–19</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>7.0–7.4</td>
</tr>
<tr>
<td>3.0</td>
<td>–</td>
<td>20–24</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>7.5–7.9</td>
</tr>
<tr>
<td>3.5</td>
<td>–</td>
<td>25–29</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>8.0–8.4</td>
</tr>
<tr>
<td>4.0</td>
<td>–</td>
<td>≥30</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>≥8.5</td>
</tr>
</tbody>
</table>

a Physical exercise causing sweating/or some shortness of breath.
A total CVD risk score of ≥4.5 was used as a recommendation to see a doctor.
The mean CVD-risk score in this population was 3.15 (median 2.5). High scores (4.5 or over) were observed in 26.5% of the sample. People belonging to the highest quartile of CVD-risk score were considered high-risk subjects.

The prevalence of main CVD risk factors among women and men is shown in Table 2. The most prevalent risk factors were smoking in 19 versus 27%, hypercholesterolaemia in 38 versus 40%, BMI above 25 kg/m² in 31 versus 54%, family history of CVD in 44 versus 41%, hypertension in 18 versus 19% and excessive alcohol consumption in 8.0 versus 33% among women and men, respectively.

Diabetes was reported by 1.5% and a personal history of CVD (including hypertension) by 23.5% of the population. Eleven per cent reported that they did not exercise during leisure time at all, 37.7% reported exercising three times a week or more, 26.3% 1–2 times a week, 12.3% approximately once a week and 12.5% occasionally. BMI was below 25 kg/m² in 59% of the population, in 34% of men and 66% of women. Within the population, 31.6% were slightly overweight (BMI 25–29 kg/m²) and 9.3% were markedly overweight (BMI over 30 kg/m²). In the age-group 18–34 years, there was a statistical difference of BMI between the genders, i.e. 10% per cent of women and 35% of men had a BMI >25 kg/m² ($P < 0.001$). BMI increased with age and in the age-group 35–45 years, 22.6% of women and 54.4% of men were overweight ($P$-value n.s.). In the age group 45–54 years, 31% of women and 56% of men ($P < 0.001$) and in the age-group 55–65 years 55% of women and 64% of men ($P$-value n.s.) were overweight.

The frequency of high CVD-risk scores (≥4.5) among men and women in different age groups is shown in Table 3. High CVD-risk scores increased with age in women, but in men the proportion of high CVD-risk scores was highest in the age-group 45–54 years, i.e. 41.2%. In the age-group 45–54 years, the prevalence between men and women differed statistically ($P < 0.005$). The number of combined CVD risk factors is shown in Table 4. Three or more risk factors were reported by 4% of women and 7% of men.

In logistic regression analysis with multiple variables (alcohol intake, diabetes, family history of CVD/diabetes and gender), CVD scores were also dependent on alcohol intake/time (OR 1.7, 95% CI 1.1–2.7) and family history (OR 1.5, 95% CI 1.0–2.1). Both of these variables increased the risk of CVD when considered together. Diabetes and gender did not explain the high CVD score in the multiple-variable model. Young age-groups (18–34 and 35–44 years) lowered the CVD risk: (OR 0.2, 95% CI 0.1–0.4) and (OR 0.5, 95% CI 0.3–0.8).

**Table 2: CVD risk factor prevalence among women and men**

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>No. of women</th>
<th>%</th>
<th>No. of men</th>
<th>%</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>70</td>
<td>18.7</td>
<td>77</td>
<td>26.6</td>
<td>0.015</td>
</tr>
<tr>
<td>Hypertension</td>
<td>67</td>
<td>17.8</td>
<td>56</td>
<td>19.2</td>
<td>n.s.</td>
</tr>
<tr>
<td>Hypercholesterolaemia</td>
<td>96</td>
<td>38.4</td>
<td>80</td>
<td>40.2</td>
<td>n.s.</td>
</tr>
<tr>
<td>BMI &gt;25 kg/m²</td>
<td>116</td>
<td>30.9</td>
<td>157</td>
<td>54.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Alcohol consumption &gt;4 units/session</td>
<td>28</td>
<td>8.0</td>
<td>90</td>
<td>32.9</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diabetes</td>
<td>5</td>
<td>1.3</td>
<td>5</td>
<td>1.7</td>
<td>n.s.</td>
</tr>
<tr>
<td>Lack of physical exercise</td>
<td>43</td>
<td>11.4</td>
<td>32</td>
<td>11.0</td>
<td>n.s.</td>
</tr>
<tr>
<td>Positive family history of CVD/diabetes</td>
<td>167</td>
<td>44.4</td>
<td>118</td>
<td>40.5</td>
<td>n.s.</td>
</tr>
<tr>
<td>Personal history of CVD</td>
<td>86</td>
<td>22.9</td>
<td>71</td>
<td>24.4</td>
<td>n.s.</td>
</tr>
</tbody>
</table>

* 218 persons did not know their cholesterol level at all ($n = 449$).

**Table 3: High CVD risk scores in different age groups**

<table>
<thead>
<tr>
<th>Age group</th>
<th>No. women</th>
<th>Women &gt; 4.5, No. (%)</th>
<th>No. men</th>
<th>Men &gt; 4.5, No. (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–34</td>
<td>70</td>
<td>4 (5.7)</td>
<td>51</td>
<td>7 (13.7)</td>
<td>ns</td>
</tr>
<tr>
<td>35–44</td>
<td>84</td>
<td>14 (16.7)</td>
<td>68</td>
<td>19 (27.9)</td>
<td>ns</td>
</tr>
<tr>
<td>45–54</td>
<td>137</td>
<td>33 (24.1)</td>
<td>97</td>
<td>40 (41.2)</td>
<td>0.005</td>
</tr>
<tr>
<td>55–65</td>
<td>85</td>
<td>34 (40.0)</td>
<td>75</td>
<td>26 (34.7)</td>
<td>ns</td>
</tr>
</tbody>
</table>

$n = 376$ $n = 291$
The number of overweight young males was also remarkable in the present study. Besides being overweight, on average middle-aged men had more CVD risk factors than women of the same age. Structured routine health checks may still be the best way for the doctor to meet middle-aged men, and particular attention should be paid to their weight.

Approximately 5% of the sample admitted to having three or more risk factors. Epidemiological studies have established that multiple risk factors increase the probability of cardiovascular events. CVD risk factors tend to aggregate and usually appear in combinations. The accumulation of risk factors is a challenge to the doctor, and the ‘blindness’ of this accumulation could be avoided by a systematic approach of recording CVD risk factors. Interventions related to modifiable risk factors as now screened should be encouraged.

Finnish primary care offers good prospects for early prevention among patients with single or multiple CVD risk factors, as 85% of the population visits a physician yearly. The present study shows that screening of a small suburban population for CVD risk factors by CATI can be successful, and is a powerful tool for primary health care intervention studies. Particular attention should be paid to middle-aged overweight males regardless of reasons for appointment. Our health centre is now offering CVD prevention programmes to individuals identified by CATI as being at high risk for CVD.

**References**


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