RESEARCH COMMUNICATION

# Familial Prevalence of Cancer in Iran: A General Population Estimate

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## Abstract

**Background: Having a family history (FH) of cancer is recognized as one of the most important factors in predicting personal cancer risk. Since reports on cancer FH from developing countries are limited, the present study was conducted to provide a first report on the prevalence of familial cancers in Iran. Methods: Cross-sectional analysis performed on self-reported FH of cancers based on data from a large population based study in Tehran, the capital of Iran. Each participant was shown a list of site-specific cancers and asked if a relative had been diagnosed with any cancer on the list, completing the question by specifying the age of diagnosis. Results: Stomach cancer (4.6%) was the most common condition noted for family members, followed by the cancers of the breast (4.2%), lung (3.5%), liver (3.1%), leukemia (3.0) and colorectum (2.8%). The most frequent cancer reported by the responders was breast (1.8%) in first degree relatives (FDR) and stomach (1.8%) and stomach (2.8%) in second degree relatives (SDR). A FH of cancer was more commonly reported by younger persons and females. Of all respondents with a positive FH, 28.2% had at least one affected person diagnosed at age under 50 years in their FDRs. Conclusion: A substantial proportion of individuals in the Iran report having a family member affected by cancer, and thus may be recommended for early cancer screening services.**

**Keywords:** Family history - cancer in Iran- prevalence - cross-sectional - self-report - screening

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## Introduction

Assessment of family health history is an important tool for reducing the societal burden of cancer (Ramsey et al., 2006). A positive family history(FH) of cancer is recognized as one of the most important risk factors in predicting personal cancer risk (Hall et al., 2001). Individuals who have at least one first-degree relatives(FDR) affected with cancer are often at increased risk for developing cancer (Ramsey et al., 2006). The risk associated with a FH of cancer depend on the number of affected relatives (Claus et al., 1990; Steinberg et al., 1990; Newcomb et al., 1999) and having relatives with an early age of cancer onset (Sattin et al., 1985; Negri et al., 1997; Bhatia et al., 1999; Bratt et al., 1999). The magnitude of the risk estimate is less when only second- or third-degree relatives are affected (Sattin et al., 1985; Mink et al., 1996).

Several clinical practice guidelines suggest that individuals fulfilling FH criteria for specific cancers may benefit from particular screening programs or initiating screening at an earlier age compared with general population (Ramsey et al., 2006). A major problem in planning cancer genetic services is that it is not known as to what proportion of the population fit into the various cancer genetic risk categories (Wallace et al., 2004). A better understanding of the characteristics of hereditary cancers should increase our ability to identify families with a predisposition. Though, the prevalence of FH of cancer has been studied in many developed countries, data from developing countries like Iran are still scantly. The aim of this study was to provide a first-time report on the prevalence of cancers in Iranian families.

## Materials and Methods

This study designed as a cross-sectional survey in general population (2006-2007) of Tehran province (including Tehran metropolitan, and five other cities and their rural areas). Totally 7,300 persons (older that 20 years) sampled by random sampling on the basis of the list of postal codes (registered in Tehran central post office), of whom 6,700 persons agreed to participate (response rate 92%). Then research group were referred to each selected

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**Table 1. Prevalence of First and Second Degree Relative Family History of Cancer According to Age of Responders**

| Cancer | | <39 years(n=3108) | | | 40-49 years(n=1209) | | | 50-59 years(n=997) | | | >60 years(n=1139) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Cancer | | n | P | CI | n | P | CI | n | P | CI | n | P | CI |
| Breast | FDR | 24 | 0.8 | 0.49-1.11 | 30 | 2.5 | 1.62-3.38 | 32 | 3.2 | 2.11-4.29 | 27 | 2.4 | 1.51-3.29 |
| | SDR | 100 | 3.2 | 2.58-3.82 | 30 | 2.5 | 1.62-3.38 | 16 | 1.2 | 0.52-1.88 | 10 | 0.9 | 0.35-1.45 |
| Skin | FDR | 1 | 0.03 | 0.00-0.09 | 2 | 0.2 | 0.00-0.45 | 1 | 0.1 | 0.00-0.30 | 3 | 0.3 | 0.00-0.62 |
| | SDR | 9 | 0.3 | 0.11-0.49 | 2 | 0.2 | 0.00-0.45 | 1 | 0.1 | 0.00-0.30 | 1 | 0.1 | 0.00-0.28 |
| Leukemia | FDR | 22 | 0.7 | 0.41-0.99 | 28 | 2.3 | 1.46-3.14 | 22 | 2.2 | 1.29-3.11 | 17 | 1.5 | 0.79-2.21 |
| | SDR | 75 | 2.4 | 1.86-2.94 | 17 | 1.4 | 0.74-2.06 | 5 | 0.5 | 0.06-0.94 | 4 | 0.4 | 0.03-0.77 |
| Esophagus | FDR | 5 | 0.2 | 0.04-0.36 | 4 | 0.3 | 0.00-0.61 | 3 | 0.3 | 0.00-0.64 | 5 | 0.4 | 0.03-0.77 |
| | SDR | 12 | 0.4 | 0.18-0.62 | 2 | 0.1 | 0.00-0.28 | 0 | 0 | - | 0 | 0 | - |
| Stomach | FDR | 33 | 1.1 | 0.73-1.47 | 34 | 2.8 | 1.87-3.73 | 29 | 2.9 | 1.86-3.94 | 17 | 1.5 | 0.79-2.21 |
| | SDR | 131 | 4.2 | 3.49-4.91 | 27 | 2.2 | 1.37-3.03 | 10 | 1.0 | 0.38-1.62 | 12 | 1.1 | 0.49-1.71 |
| Pancreas | FDR | 2 | 0.1 | 0.00-0.21 | 4 | 0.3 | 0.00-0.61 | 3 | 0.3 | 0.00-0.64 | 2 | 0.2 | 0.00-0.46 |
| | SDR | 18 | 0.6 | 0.87-0.33 | 3 | 0.2 | 0.00-0.45 | 1 | 0.1 | 0.00-0.30 | 1 | 0.1 | 0.00-0.28 |
| Colorectal | FDR | 16 | 0.5 | 0.25-0.75 | 25 | 2.1 | 1.29-2.91 | 16 | 1.6 | 0.82-2.38 | 17 | 1.5 | 0.79-2.21 |
| | SDR | 78 | 2.5 | 1.95-3.05 | 20 | 1.7 | 0.97-2.43 | 8 | 0.8 | 0.25-1.35 | 6 | 0.5 | 0.09-0.91 |
| Liver | FDR | 29 | 0.9 | 0.57-1.23 | 21 | 1.7 | 0.97-2.43 | 21 | 1.7 | 0.90-2.50 | 15 | 1.3 | 0.64-1.96 |
| | SDR | 80 | 2.6 | 2.04-3.16 | 18 | 1.5 | 0.81-2.19 | 10 | 1.0 | 0.38-1.62 | 6 | 0.5 | 0.09-0.91 |
| Kidney | FDR | 4 | 0.1 | 0.00-0.21 | 4 | 0.3 | 0.00-0.61 | 5 | 0.5 | 0.06-0.94 | 1 | 0.1 | 0.00-0.28 |
| | SDR | 9 | 0.3 | 0.11-0.49 | 0 | 0 | - | 4 | 0.4 | 0.01-0.79 | 1 | 0.1 | 0.00-0.28 |
| Lung | FDR | 29 | 0.9 | 0.57-1.23 | 27 | 2.2 | 1.37-3.03 | 29 | 2.9 | 1.86-3.94 | 30 | 2.6 | 1.68-3.52 |
| | SDR | 85 | 2.7 | 2.13-3.27 | 10 | 0.8 | 0.30-1.30 | 7 | 0.7 | 0.18-1.22 | 5 | 0.4 | 0.03-0.77 |
| Prostate | FDR | 9 | 0.3 | 0.11-0.49 | 20 | 1.7 | 0.97-2.43 | 10 | 1.0 | 0.38-1.62 | 8 | 0.7 | 0.22-1.18 |
| | SDR | 55 | 1.8 | 1.33-2.27 | 8 | 0.7 | 0.23-1.17 | 5 | 0.5 | 0.06-0.94 | 1 | 0.1 | 0.00-0.28 |
| Ovary | FDR | 1 | 0.03 | 0.00-0.09 | 1 | 0.08 | 0.00-0.24 | 0 | 0 | - | 0 | 0 | - |
| | SDR | 4 | 1.0 | 0.65-1.35 | 0 | 0 | - | 0 | 0 | - | 0 | 0 | - |
| Uterus | FDR | 11 | 0.4 | 0.18-0.62 | 10 | 0.8 | 0.30-1.30 | 8 | 0.8 | 0.25-1.35 | 7 | 0.6 | 0.15-1.05 |
| | SDR | 45 | 1.4 | 0.99-1.81 | 9 | 0.7 | 0.23-1.17 | 5 | 0.5 | 0.06-0.94 | 5 | 0.4 | 0.03-0.77 |
| Brain | FDR | 8 | 0.3 | 0.11-0.49 | 6 | 0.5 | 0.10-0.90 | 10 | 1.0 | 0.38-1.62 | 9 | 0.8 | 0.28-1.32 |
| | SDR | 37 | 1.2 | 0.82-1.58 | 7 | 0.6 | 0.16-1.04 | 4 | 0.4 | 0.01-0.79 | 1 | 0.1 | 0.00-0.28 |
| Lymphoma | FDR | 1 | 0.03 | 0.00-0.09 | 0 | 0 | - | 2 | 0.2 | 0.00-0.48 | 1 | 0.1 | 0.00-0.28 |
| | SDR | 4 | 0.1 | 0.00-0.21 | 0 | 0 | - | 1 | 0.1 | 0.00-0.30 | 0 | 0 | - |
| Bladder | FDR | 1 | 0.03 | 0.00-0.09 | 3 | 0.2 | 0.00-0.45 | 1 | 0.1 | 0.00-0.30 | 2 | 0.2 | 0.00-0.46 |
| | SDR | 5 | 0.2 | 0.04-0.36 | 1 | 0.1 | 0.00-0.28 | 1 | 0.1 | 0.00-0.30 | 0 | 0 | - |
| Thyroid | FDR | 1 | 0.1 | 0.00-0.21 | 0 | 0 | - | 0 | 0 | - | 0 | 0 | - |
| | SDR | 0 | 0 | - | 1 | 0.1 | 0.00-0.28 | 0 | 0 | - | 0 | 0 | - |
| Tongue | FDR | 1 | 0.03 | 0.00-0.09 | 1 | 0.1 | 0.00-0.28 | 1 | 0.1 | 0.00-0.30 | 0 | 0 | - |
| | SDR | 2 | 0.1 | 0.00-0.21 | 1 | 0.1 | 0.00-0.28 | 0 | 0 | - | 0 | 0 | - |
| Bone | FDR | 10 | 0.3 | 0.11-0.49 | 7 | 0.6 | 0.16-1.04 | 8 | 0.8 | 0.25-1.35 | 8 | 0.7 | 0.22-1.18 |
| | SDR | 23 | 0.7 | 0.41-0.99 | 7 | 0.6 | 0.16-1.04 | 1 | 0.1 | 0.00-0.30 | 3 | 0.3 | 0.00-0.62 |
| Head &Neck | FDR | 16 | 0.5 | 0.25-0.75 | 17 | 1.4 | 0.74-2.06 | 13 | 1.3 | 0.60-2.00 | 14 | 1.2 | 0.57-1.83 |
| | SDR | 54 | 1.7 | 1.25-2.15 | 15 | 1.2 | 0.59-1.81 | 5 | 0.5 | 0.06-0.94 | 6 | 0.5 | 0.09-0.91 |

postal code and interviewed with all members of selected house according to questionnaire. The participants were informed that attending the interview was not compulsory and patient's anonymity was preserved. Ethics Committee of Research Center for Gastroenterology and Liver Diseases, Shahid Beheshti University of Medical Science approved research protocol.

Each participant was shown a list of site-specific cancers and asked if a relative had been diagnosed with any of those included, completing the question by specifying the age of diagnosis and sex. First degree relatives (FDR) were defined as parents, siblings, or children; and second degree relatives (SDR) as grandparents, aunts and uncles.

The independent t-test was used to test for a differences between groups for continuous variable means. Pearson's chi-square was performed to test for independence of categorical variables. Numeric variables are presented as mean ± standard deviation other parameters as frequency and percentage. Logistic regression was used to estimation of odds ratio (OR). A $P<0.05$ was considered statistically significant.

## Results

Of the 6,700 responders, 357 reported unknown FH for all cancers studied and were excluded from further analyses. There for 6,435 individuals interred to the study. The mean ± SD age of responders with positive FH was 38.0±17.5 years, it is significantly higher than the mean age (mean±SD: 41.2±19.1) of those with negative FH (P=0.001). A female preponderance was seen in our participants (54.8% female vs. 45.2% male, P=0.003). Of the 6,453responders in this analysis, 1685 (26.1%) reported a FH of any cancer in their relatives. Of these, 787(12.2) people reported a FH of any cancer in FDRs, and 989(15.3%) reported a FH of any cancer in SDRs. The mean±SD age at diagnosis of affected relatives for all cancers under study was 55.7 ± 16.8 and 57.4 ± 16.4 years in FDR and SDR, respectively (P=0.024).

The prevalence of first and second degree relative

**Table 2. Prevalence of First and Second Degree Relative Family History of Cancer According to Sex of Responders**

| | Male(n=3117) | | | Female (n=3336) | | | Total (n=6453) | | |
|---|---|---|---|---|---|---|---|---|---|
| Type of Cancer | n | P | CI | n | P | CI | n | P | CI |
| Breast | | | | | | | | | |
| FDR | 32 | 1.0 | 0.65-1.35 | 81 | 2.4 | 1.88-2.92 | 113 | 1.8 | 1.48-2.12 |
| SDR | 60 | 1.9 | 1.42-2.38 | 96 | 2.9 | 2.33-3.47 | 156 | 2.4 | 2.03-2.77 |
| Skin | | | | | | | | | |
| FDR | 5 | 0.2 | 0.04-0.36 | 2 | 0.1 | 0.00-0.21 | 7 | 0.1 | 0.02-0.18 |
| SDR | 6 | 0.2 | 0.04-0.36 | 7 | 0.2 | 0.05-0.35 | 13 | 0.2 | 0.09-0.31 |
| Leukemia | | | | | | | | | |
| FDR | 39 | 1.3 | 0.90-1.70 | 50 | 1.5 | 1.09-1.91 | 89 | 1.4 | 1.11-1.69 |
| SDR | 51 | 1.6 | 1.16-2.04 | 50 | 1.5 | 1.09-1.91 | 101 | 1.6 | 1.29-1.91 |
| Esophagus | | | | | | | | | |
| FDR | 13 | 0.4 | 0.18-0.62 | 4 | 0.1 | 0.00-0.21 | 17 | 0.3 | 0.17-0.43 |
| SDR | 7 | 0.2 | 0.04-0.36 | 7 | 0.2 | 0.05-0.35 | 14 | 0.2 | 0.09-0.31 |
| Stomach | | | | | | | | | |
| FDR | 62 | 2.0 | 1.51-2.49 | 51 | 1.5 | 1.09-1.91 | 113 | 1.8 | 1.48-2.12 |
| SDR | 85 | 2.7 | 2.13-3.27 | 95 | 2.8 | 2.24-3.36 | 180 | 2.8 | 2.40-3.20 |
| Pancreas | | | | | | | | | |
| FDR | 3 | 0.1 | 0.00-0.21 | 8 | 0.2 | 0.05-0.35 | 11 | 0.2 | 0.09-0.31 |
| SDR | 10 | 0.3 | 0.11-0.49 | 13 | 0.4 | 0.19-0.61 | 23 | 0.4 | 0.25-0.55 |
| Colorectal | | | | | | | | | |
| FDR | 31 | 1.0 | 0.65-1.35 | 43 | 1.3 | 0.92-1.68 | 74 | 1.1 | 0.85-1.35 |
| SDR | 54 | 1.7 | 1.25-2.15 | 58 | 1.7 | 1.26-2.14 | 112 | 1.7 | 1.38-2.02 |
| Liver | | | | | | | | | |
| FDR | 34 | 1.1 | 0.73-1.47 | 52 | 1.6 | 1.17-2.03 | 86 | 1.3 | 1.02-1.58 |
| SDR | 48 | 1.5 | 1.07-1.93 | 66 | 0.2 | 0.05-0.35 | 114 | 1.8 | 1.48-2.12 |
| Kidney | | | | | | | | | |
| FDR | 5 | 0.2 | 0.04-0.36 | 9 | 0.3 | 0.11-0.49 | 14 | 0.2 | 0.09-0.31 |
| SDR | 9 | 0.3 | 0.11-0.49 | 5 | 0.1 | 0.00-0.21 | 14 | 0.2 | 0.09-0.31 |
| Lung | | | | | | | | | |
| FDR | 56 | 1.8 | 1.33-2.27 | 59 | 1.8 | 1.35-2.25 | 115 | 1.8 | 1.48-2.12 |
| SDR | 48 | 1.5 | 1.07-1.93 | 59 | 1.8 | 1.35-2.25 | 107 | 1.7 | 1.38-2.02 |
| Prostate | | | | | | | | | |
| FDR | 26 | 0.8 | 0.49-1.11 | 21 | 0.6 | 0.34-0.86 | 47 | 0.7 | 0.50-0.90 |
| SDR | 37 | 1.2 | 0.82-1.58 | 32 | 1.0 | 0.66-1.34 | 69 | 1.1 | 0.85-1.35 |
| Ovary | | | | | | | | | |
| FDR | 0 | 0 | - | 2 | 0.1 | 0.00-0.21 | 2 | 0.03 | 0.01-0.07 |
| SDR | 3 | 0.1 | 0.00-0.21 | 1 | 0.03 | 0.00-0.09 | 4 | 0.1 | 0.02-0.18 |
| Uterus | | | | | | | | | |
| FDR | 17 | 0.5 | 0.25-0.75 | 19 | 0.6 | 0.34-0.86 | 36 | 0.6 | 0.41-0.79 |
| SDR | 32 | 1.0 | 0.65-1.35 | 32 | 0.1 | 0.00-0.21 | 64 | 1.0 | 0.76-1.24 |
| Brain | | | | | | | | | |
| FDR | 18 | 0.6 | 0.33-0.87 | 15 | 0.2 | 0.05-0.35 | 33 | 0.5 | 0.33-0.67 |
| SDR | 21 | 0.7 | 0.41-0.99 | 28 | 0.8 | 0.50-1.10 | 49 | 0.8 | 0.58-1.02 |
| Lymphoma | | | | | | | | | |
| FDR | 4 | 0.1 | 0.00-0.21 | 0 | 0 | - | 4 | 0.06 | 0.00-0.12 |
| SDR | 1 | 0.03 | 0.00-0.09 | 4 | 0.1 | 0.00-0.21 | 5 | 0.08 | 0.01-0.15 |
| Bladder | | | | | | | | | |
| FDR | 2 | 0.1 | 0.00-0.21 | 5 | 0.1 | 0.00-0.21 | 7 | 0.1 | 0.02-0.18 |
| SDR | 1 | 0.03 | 0.00-0.09 | 6 | 0.2 | 0.05-0.35 | 7 | 0.1 | 0.02-0.18 |
| Thyroid | | | | | | | | | |
| FDR | 0 | 0 | - | 1 | 0.03 | 0.00-0.09 | 1 | 0.02 | 0.00-0.05 |
| SDR | 0 | 0 | - | 1 | 0.03 | 0.00-0.09 | 1 | 0.02 | 0.00-0.05 |
| Tongue | | | | | | | | | |
| FDR | 0 | 0 | - | 3 | 0.1 | 0.00-0.21 | 3 | 0.05 | 0.00-0.10 |
| SDR | 2 | 0.1 | 0.00-0.21 | 1 | 0.03 | 0.00-0.09 | 3 | 0.05 | 0.00-0.10 |
| Bone | | | | | | | | | |
| FDR | 9 | 0.3 | 0.11-0.49 | 24 | 0.7 | 0.42-0.98 | 33 | 0.51 | 0.34-0.68 |
| SDR | 17 | 0.5 | 0.25-0.75 | 17 | 0.5 | 0.26-0.74 | 34 | 0.53 | 0.35-0.71 |
| Head&Neck | | | | | | | | | |
| FDR | 26 | 0.8 | 0.49-1.11 | 34 | 1.0 | 0.66-1.34 | 60 | 0.9 | 0.67-1.13 |
| SDR | 33 | 1.1 | 0.73-1.47 | 47 | 1.4 | 1.00-1.80 | 80 | 1.2 | 0.93-1.47 |

FH of cancer according to age and sex of responders are shown in Tables 1 and 2. The prevalence of cancer reported was ranged from 0 to 4.6% among sample study. Stomach cancer (2.7%) and breast cancer (2.9%) were the most prevalent malignancies reported by male and female participant. Totally, the six prevalent cancers

**Table 3. Distribution of Responders with First or Second Degree Relatives According to Diagnostic Age of Affected Person (<50, >50 and both ages <50 and >50 years)**

| Family history | One or more affected relatives at age <50 years | | | One or more affected relatives at age >50 years | | | One or more affected relatives at both ages, <50 and >50 years | | |
|---|---|---|---|---|---|---|---|---|---|
| | n | P | CI | n | P | CI | n | P | CI |
| FDR(n=753) | 212 | 28.2 | 25.0-31.4 | 512 | 68.0 | 64.7-71.3 | 29 | 3.8 | 2.4-5.2 |
| SDR(n=928) | 214 | 23.1 | 20.1-25.8 | 659 | 71.0 | 68.1-73.9 | 55 | 5.9 | 4.4-7.4 |

**Table 4. Age and Sex-specific Odds Ratio for Likely Report of Family History of Cancer**

| | n | P (%) | CI for P | OR | P-value | CI for OR |
|---|---|---|---|---|---|---|
| Overall | 1685 | 26.1 | 25.03-27.17 | - | - | - |
| Age-Specific | | | | | | |
| <39 | 878 | 28.2 | 27.10-29.30 | 1.77 | 0.001 | 1.47-2.10 |
| 40-49 | 348 | 28.8 | 27.70-29.90 | 1.82 | 0.001 | 1.50-2.21 |
| HERE 50-59 | 252 | 25.3 | 24.24-26.36 | 1.52 | 0.001 | 1.24-1.87 |
| >60 | 207 | 18.2 | 17.26-19.14 | 1 | - | - |
| Sex- specific | | | | | | |
| Male | 761 | 45.2 | 43.99-46.41 | 1 | - | - |
| Female | 924 | 54.8 | 53.59-56.01 | 1.19 | 0.003 | 1.06-1.33 |

among participant's relatives were: stomach (4.6%), breast (4.2%), lung (3.5%), liver (3.1%), leukemia (3.0) and colorectal (2.8%). The most frequent cancer reported by the responders was breast (1.8%) and stomach (1.8%) in FDR and stomach (2.8%) in SDR.

In our sample, female with FH, 438 (13.1%) reported having a FDR history and 540 (16.2%) reported having only a SDR history. Regarding to male responders, 349 (11.2%) reported having a FDR and 449 (14.4%) having a SDR affected with cancer. Observed difference between male and female was significant (P<0.05).

Distribution of FH in FDRs and SDRs according to age of affected relatives (<50, >50 and both age groups) was shown in Table 3. Of those responders with positive FH, 212(28.2%) and 214(23.1%) have at least one affected person diagnosed at age <50 years in first or second relatives, respectively.

We used logistic regression method and odds ratio (OR) to estimation the relative risk, since the outcome of interest was an uncommon event in the study population (Table 4). Our data show that, participants aged<60 years were more than one and a half times as likely to report a FH of any cancer than those aged>60 years, and that female responders were significantly more likely than males to report this (OR=1.19, CI95%: 1.06-1.33).

## Discussion

Few population-based studies have examined the percentage of persons in the general population who have a positive FH of cancer. This study is the first manuscript on the prevalence of a positive FH of cancer among general population of Iran. In this study we estimated the prevalence of individuals in the Iranian general population who report a FDR or SDR family history of any cancers. Overall, approximately one in four respondents reports that a first or second relative has had cancer. The estimates for the population prevalence of having at least one relative with cancer were reported from 0 to 4.6 in this study. A female preponderance was seen for FH report. In this section we focused on most prevalent cancers reported among our study participants.

Our finding showed that the prevalence of having one or more affected FDRs with cancer independent of age at diagnosis was 3.8%. Population-based data on the prevalence of having a FH of common cancers are still scant. The estimates for the population prevalence of having at least one FDR with breast or ovarian cancer were ranged between 7.3 to 7.7 and 1.6 to 1.8 percent, respectively (Palomaki et al., 2006; Ramsey et al., 2006; Hall et al., 2008). Having a FH of breast cancer is associated with an increased risk for the disease and this risk would be increased when the healthy female has a family member with breast cancer diagnosed at a young age or if she has more than one first-degree relative with breast cancer diagnosed at any age (Dite et al., 2003).

In the present study, 12.2% and 15.3 % of the responders have at least one FDR or SDR diagnosed with cancer, respectively. Having a FH of cancer was reported in 36.4% of cases and 24.4% of controls by Safaee et al., (2010). They also reported that 26% of cases and 11.5 % of controls have had at least one FDRs affected with cancer and 17.3% of cases and 14% of controls have had at least one SDRs affected with cancer. Our prevalence estimates for FH of cancer are different with this study. Such discrepancies between our results and the previous ones might be due to methodological differences in sample selection.

Many studies on FH of cancer were performed in cohorts of patients affected with cancer. For example, in one study on stomach cancer in Italy, Bernini et al., (2006) reported that stomach cancer was the most common FH of cancer in the stomach cancer patients followed by colorectal cancer and barest cancer and, about 22 percent of their patients had a FH of stomach cancer. These results are similar to one Japanese study (Kawasaki et al., 2007). Stomach cancer and breast cancer was the most frequent cancer among our participant's relatives.

Some U.S. studies estimated that 5% of the general population have at least one FDR with colorectal cancer (Hakama, 2006; Ramsey et al., 2007) and these individuals would be experience a 2-fold higher risk for the disease

(Butterworth et al., 2006). Other studies on estimate of colorectal cancer FH, reported a proportion of 10-15% of the colorectal cancer patients having an FDR with colorectal cancer (Bonelli et al., 1988; Slattery and Kerber, 1994; Olsson and Lindblom, 2003; Mitchell et al., 2005). A FH between 2.9 to 10 percent were reported in the control group in case control studies (Fuchs et al., 1994; Slattery and Kerber, 1994; de Jong and Vasen, 2006; Mai et al., 2010; Moghimi-Dehkordi et al., 2010). Our results are in accordance with some previous studies.

There are some studies reporting the FH in lung cancer (Mayne et al., 1999; Topu et al., 2004; Jin et al., 2006). Ergün et al., (2009) with a case-control study found that the proportion of FH for cancer in control group was 21.5%. Its must be kept in mind that this study was not population based and therefore these figures are probably not representative for the population, because controls will be matched with patients in case-control studies and thus may be differing compare to general population

Liver and pancreatic cancers appear to be approximately 3-fold more frequent among patients with a positive history of the corresponding cancers. In terms of population attributable risk, approximately a 3% of the pancreatic and liver cancers would be related to this familial component. Fernandez et al., (1994) reported that 2.5% and 1.1% of the individuals in the control group reported a FH of liver cancer pancreas cancer, respectively. Our estimates were similar to previous estimates.

Some studies have found a 2 to 3-fold higher leukemia incidence in persons with family histories of leukemia (Gunz et al., 1975; Cartwright et al., 1988) or hematopoietic cancer (Pottern et al., 1991). FH of cancer at other sites might also be associated with adult acute leukemia (Poole et al., 1999), if these sites have familially shared risk factors in common with leukemia. Our prevalence estimate are similar to Grath et al., (2002) study on FH on leukemia. They have reported a 3.8% first-degree FH of leukemia cancer among control group.

Prostate cancer is one of malignancies that appear to have strong genetic components that can confer additional risk to family members (Noe et al., 2008). Three meta-analyses estimated the relative risk of prostate cancer in males with FDR diagnosed with prostate cancer and found pooled relative risks of 2.22, 2.50, and 2.53 (Bruner et al., 2003; Johns and Houlston, 2003; Zeegers et al., 2003) and in males with SDR the relative risks decreased to 1.88 (Bruner et al., 2003) and 1.68 (Zeegers et al., 2003). The relative risk of prostate cancer increases as the number of FDRs increases (Noe et al., 2008). Cerhan et al., (1999) with study on 101 incident cases of prostate cancer reported that 4.6% of the cohort had a FH of prostate cancer in a brother or father. Mai et al., (2010) reported that 7.0% of all responders have had a FH of cancer among their FDRs. Our estimate for prostate cancer (1.8%) in general population was lower than even the minimum of these estimates. Such discrepancies may result in an underestimation for the estimation of FH in this study.

We found that participants aged less than 65 years (compared to age>65years) and females (compared to males) were more likely to report the FH of cancer (Scheuner et al., 2010). These findings may reflect problems with recall among older participants in the study or may be due to the fact that older responders were less informed about cancer in their FDRs and SDRs. Because specificity of self-reports of cancer FH is high with lower rates of sensitivity, it seems more likely that males are underreporting their FHs than females overreporting (Scheuner, 2010 #58). The reasons for these reporting differences of cancer FH should be investigated.

An important question that merits attention is to what extent self-reported FH mentioned by the participants is valid and reliable? Some studies suggested that about 85% of self-reported FHs for the major cancer sites such as: breast cancer, colorectal cancer, and lung cancer can be confirmed through medical records (Anton-Culver et al., 1996; Douglas et al., 1999; Sijmons et al., 2000). A study found that respondents those aged greater than 75 years were significantly more likely to give a false-negative report of their cancer history than those aged 45-64 years (Desai et al., 2001). Another study found the overall sensitivity and specificity of self-reported breast cancer to be quite high (Abraham et al., 2009). Females who were older, less educated, or of nonwhite race/ethnicity had the lowest sensitivities (Schrijvers et al., 1994; Desai et al., 2001; Parikh-Patel et al., 2003; Dominguez et al., 2007). Goldberg showed that a number of participants may have felt that cancers diagnosed years and decades ago were unimportant and not worth reporting, since they had survived and moved on. Alternatively, the observed association between time since diagnosis and self-reported cancer history may reflect a period effect with respect to patient-physician communication and disclosure of cancer diagnosis; evidence suggests that, in many instances, cancer diagnoses were not communicated clearly, if at all, in the past, but over time, patient-physician communication has improved (Goldberg, 1984). No validation studies has been reported of self-reported FH of leukemia (Rauscher et al., 2002). However, most validations have not examined underreporting, and reported confirmation rates from previous studies.

There are also some limitations to the data. First, population-based and cross-sectional data gathering has own pitfalls. The most important is selection and recall bias and low quality of data. We used random sampling in order to reduce bias in selection. On the other hand, our analysis is based on the reported FHs by the respondents and not confirmed through other medical records. This may also influence the results. Second, it is reported that prevalence of FH depends on of family size, and unfortunately we didn't have ant information of size of family for participants.

Our study has also some strength. Because of randomization in sample selection, our study population is representative of total population of Iran. These samples were drown up from urban and rural areas of Tehran province, capital of Iran. Most of the previous researches conducted on evaluation of the prevalence of FH only among FDR. In this study, we also considered the prevalence of a FH of cancer in SDR. In this research work participants were asked to complete a question on age at diagnosis of cancer in their relatives. This may be help us to estimate the at risk groups for cancer development in

total population and encourage them to participate in early diagnosis and screening program for cancers.

In total, the estimates of prevalence presented here are likely to be conservative compared with actual prevalence because of self-reported data gathering. In addition, our findings showed that the reported prevalence of FH of cancers varied by specific respondent characteristics such as age and sex. Since it has suggested that those with FDRs who develop cancer at a young age and those with multiple affected relatives are at high enough risk to warrant early screening (Mai et al., 2010), public awareness is important. Further researches are needed to evaluate what tools can be used to promote accurate reporting of FH especially in SDRs.

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