Risk perception of type 2 diabetes

Quantitative studies

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<th>Author and year</th>
<th>Study aim(s) as relevant to the current review</th>
<th>Country</th>
<th>Participants (number and characteristics)</th>
<th>Design</th>
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<th>Perceived risk results</th>
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| Forsyth & Goetsch (1997) | To determine whether family history of type 2 diabetes is associated with perceived risk and whether perceived risk of type 2 diabetes is associated with health protective behaviours | USA | DEMOGRAPHICS  
N=30 people with at least one parent with type 2 diabetes  
Age: M=32.6  
Gender: 18 men, 12 women | Case control, questionnaire | Perceived risk:  
two items: how likely participants thought they were to develop diabetes in the next 10 years and how likely the subjects believed the average person would be to develop diabetes in the next 10 years (7-point scale: no chance to certain to happen)  
Health protective behaviours: | People with family history of type 2 diabetes perceived themselves to be significantly more at risk for diabetes than the control group or people with family history of hypertension (both p<0.001). People with family history of type 2 diabetes scored higher on the HPBI scale in comparison to |
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| Family history of diabetes: questionnaire or by recruiting children of people with type 2 diabetes | Amended versions of the Health Promotion and Disease Prevention supplement of the National Health Interview Survey (NHIS) assessing physician check-ups, weight reduction, diet, exercise | the control group (no family history of diabetes) ($p<0.002$) and to the group with family history of hypertension ($p<0.002$). Diet and exercise did not differ significantly between the groups, possibly because people did not know about the protective effects of these behaviours. Even though groups with family history of disease reported engaging in more health protective behaviours than people without such a family history, people who perceived themselves at greater risk did not necessarily
| **Farmer, Levy & Turner (1999)** | To investigate the extent to which siblings of diabetic subjects perceived themselves likely to develop type 2 diabetes | **UK** | **N=454**  
**DEMOGRAPHICS**  
**Age:** 147-35-54 years; 307-55-74 years  
**Gender:** 212 male, 242 female  
**Social group:** 170 professional or skilled non-manual; 239 skilled manual or unskilled  
**BMI:** 279<29.9; 149≥30  
**Parent with diabetes:** 245 no, 209 yes | **Cross-sectional, questionnaire** | One question: “How likely do you think it is that you will get late-onset diabetes?” (4-point scale: very likely, quite likely, not very likely, not at all likely) **Family history of diabetes:** Participants were recruited through diabetic patients | 37.9% of the siblings of diabetic patients saw themselves as likely to develop type 2 diabetes. Having a parent with diabetes was most strongly associated with perceptions of increased risk (p<.000001). Other factors associated with perceived risk included being female (p=0.003), aged 35-54 years (p=0.003). Perception of diabetes as a serious illness was not significantly associated (p=0.02). BMI and fasting glucose engage in more health protective behaviours. |
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<th>Reference</th>
<th>Objective</th>
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<th>Question</th>
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| Harwell, Dettori, Flook, Priest, Williamson, Helgerson & Gohdes (2001) | To investigate the perceptions about risk of type 2 diabetes in a population-based sample of adults ≥ 45 years of age | USA | N=576 217 with family history of diabetes | Cross-sectional, questionnaire | One question: “Do you think you are at risk of diabetes?” Family history of diabetes: self-reported | 42% of people with family history of diabetes considered themselves at risk for diabetes. The probability of considering oneself at risk of diabetes was higher among people with family history of diabetes, people under the age of 65, females, obese people and those with high blood pressure. Although family history of diabetes was most strongly associated with an increase in perceived risk, those with a positive family history were less...
| Pierce, Harding, Ridout, Keen & Bradley (2001) | To explore the beliefs of people with one adult with type 2 diabetes about their own risk of developing type 2 diabetes and to define the factors associated with increased risk perception | UK | N=105  
**DEMOGRAPHICS**  
Gender: 60 women, 45 men  
Age: median=38; range: 32-47  
Race: 79% northern European white; 8% Afro-Caribbean; 13% other  
Social class: 3% class I; 27% class II; 31% class III non-manual; 18% class III manual; 12% classes IV and V; 9% other class | Cross-sectional, questionnaire | Two questions: “How likely do you think it that you will get diabetes?” and “If neither of your parents had diabetes, how likely do you think it would be that you would get diabetes?” (4-point scale: very likely-not at all likely) | Risk perception: 66% of participants thought that it was not very likely or not at all likely that they would develop diabetes. Compared with their current situation (one parent with type 2 diabetes), 47% thought it would be less likely that they would develop diabetes if neither parent had diabetes; 50% thought it would be as likely and 3% thought it would be more likely.  
Factors associated with risk perception: Three factors were significantly
related to perceived risk of type 2 diabetes: parents having talked to offspring about diabetes risk ($p=0.04$); knowledge of the relationship between atherosclerosis and diabetes ($p=0.04$); frequency of worrying about developing diabetes ($p<0.001$). Variables not found to be significant were: regarding diabetes as serious; knowledge about complications; knowledge about smoking and type 2 diabetes; knowledge of risk factors.
| Kim, Choi, Kim, Oh & Shinn (2002) | To investigate the level of risk perceived by the offspring of type 2 diabetes patients for developing diabetes | South Korea | N=101 Korean soldiers  
**DEMOGRAPHICS**  
*Age*: median=22, range: 18-28  
*BMI*: mean=22.1  
*WHR*: mean=0.82  
*FPG level*: 4.33  
*Education*: 31.7% attending or graduated from college or university  
*Family history of type 2 diabetes*: 55.4% father with type 2 diabetes; 41.6% mother with type 2 diabetes; 3% both parents with type 2 diabetes | Cross-sectional, questionnaire | One question: “Do you think that you may develop diabetes because your parents have diabetes?”  
10.9% thought they might develop diabetes in the future. Higher education level among diabetic parents was associated with perception of increased diabetic risk (p<0.05). |
|---|---|---|---|---|---|
| Adriaanse, Snoek, Dekker, Spijkerman, Nijpels, van der Ploeg & Heine (2003) | To determine the risk perception of type 2 diabetes in the general population | The Netherlands | **Total sample**: N=7736  
**Sample participants with a parent or sibling with diabetes**: 21.7% (1679)  
Demographic information about participants with a family history of diabetes is not reported | Cross-sectional, questionnaire | One question: “At this moment, how would you estimate your risk of having diabetes, expressed in percentage?” (10-point scale – 0-100%)  
**Family history of diabetes**: self-report  
40% of the participants with a parent or sibling with diabetes perceived themselves at risk of diabetes, compared to 20% of participants without family history of diabetes. Higher age (>65), obesity and taking anti-hypertensive drugs was not associated with |
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<td>Nishigaki, Kobayashi, Hitomi, Yokomura, Yokoyama, Seki &amp; Kazuma (2007)</td>
<td>To clarify perceptions of Japanese type 2 diabetes patients regarding risk of diabetes in their offspring as well as perceptions of adult offspring of their own risk for diabetes</td>
<td>Japan</td>
<td>N=164 pairs</td>
<td>Cross-sectional, questionnaire</td>
<td>One question: “The likelihood of your offspring/you developing diabetes in comparison to the general Japanese population” (5-point scale: very likely-very unlikely)</td>
<td>74% of the offspring recognised they were at higher risk for diabetes compared to the general population from the perspective of family history, representing significantly higher risk perception in comparison to a lifestyle perspective (p&lt;0.001) and an overall view perspective (p&lt;0.01) Half of the patients believed their offspring is at an increased risk of developing type 2 diabetes due to family history of the condition.</td>
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<td>Qureshi &amp; Kai</td>
<td>To determine</td>
<td>US</td>
<td>N=3 323</td>
<td>Cross-sectional,</td>
<td>Several questions:</td>
<td>59% of the offspring recognised they were at higher risk for diabetes compared to the general population from the perspective of family history, representing significantly higher risk perception in comparison to a lifestyle perspective (p&lt;0.001) and an overall view perspective (p&lt;0.01) Half of the patients believed their offspring is at an increased risk of developing type 2 diabetes due to family history of the condition.</td>
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<td>(2008)</td>
<td>whether being informed by a doctor of increased type 2 diabetes risk because of family history is associated with risk awareness and improvement in risk-reducing behaviours</td>
<td>questionnaires</td>
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| **DEMOGRAPHICS**  
**Age:** 651: 18-34 years; 1781: 35-54 years; 891: 55+ years  
**Gender:** 1433 male, 1890 female  
**Education:** 955 up to high school; 2215 college and above  
**Income:** 859 < $25k; 1161: $25-$59k; 1303: $60k+  
**Marital status:** 2894 ever married; 390 never married | - Has your doctor ever told you that you have a greater chance of getting diabetes because it runs in your family?  
- Has your mother ever been diagnosed as having type 2 diabetes?  
- Has your father ever been diagnosed as having type 2 diabetes?  
- How many of your brothers and sisters have been diagnosed with type 2 diabetes?  
- How many of your mother’s relatives (her sisters, brothers, and parents) were diagnosed with type 2 diabetes?  
- How many of your father’s relatives (his sisters, brothers, and parents) were diagnosed with type 2 diabetes? | respondents with any family history of diabetes had not been informed of their risk of developing type 2 diabetes. Up to 50% of the informed group reported lifestyle changes to prevent type 2 diabetes, compared to 19% of the uninformed group. The informed group was more likely than the uninformed group to recognise their personal risk of type 2 diabetes (56% vs. 14%). 44% of the informed group still considered themselves not to be at risk. 69% of all informed participants, |

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Gallivan, Brown, Greenberg & Clark (2009)

To describe predictors of perceived risk for the development of type 2 diabetes

USA

N=1389

**DEMOGRAPHICS**

Demographic information is presented for the whole sample, not separately for people with family history of diabetes

Cross-sectional, telephone survey

Two questions:

- “Do you feel you could be at risk for diabetes?”
- “Why do you feel you are at risk for diabetes?”

**Family history of diabetes:** self-report

Half of the participants who felt at risk for diabetes has an immediate family member with diabetes, compared with 14% of the other group (who do not perceive themselves at risk).

Having a family history of diabetes was a significant predictor of perceived risk (p<0.01). Other predictors included younger age (<65) (p<0.01), being of a race or ethnicity other than White,
| Dorman, Valdez, Liu, Wang, Rubenstein, O’Neill, Acheson, Ruffin & Khoury (2012) | To evaluate perceived risk about type 2 diabetes among individuals at increased familial risk of diabetes | **USA** | **Total sample:** N=2081  
**Sample participants with family history of diabetes alone:** N=267  
**Age:** M=48.10  
**Gender:** 68.2% female  
**Race:** 83.9% White, 7.9% Black, 3.7% Hispanic, 4.5% Other  
**Education:** 93.6% >12 years  
**BMI:** 39%<25; 29.6% 25 to 30; 31.5%>30  
**Smoking:** 7.5% current, 24.3% former, 68.2% never  
**Sample participants with family history of diabetes and CHD or stroke:**  
N=978  
**Age:** M=51.86  
**Gender:** 72.4% female  
**Race:** 87.7% White, 3.9% Black, 3.1% Hispanic, 5.3% | **Cross-sectional, questionnaire** | **One question:** “Compared to most people your age and sex, what would you say your chances are for developing diabetes?” (1=much lower than average to 5=much higher than average)  
**Family history of diabetes:** self-report | The scores for perceived risk for diabetes became significantly higher as the number of conditions in the family history increased  
-Perceived risk without family history of diabetes=2.58  
-Perceived risk with family history of diabetes alone=3.22  
-Perceived risk with family history of diabetes and coronary heart disease or stroke=3.26 |
Teachable moments: Potential for behaviour change among people with Type 2 Diabetes and their relatives

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<th>Education: 89.7% &gt;12 years</th>
<th>BMI: 35.4%&lt;25; 33.1% 25 to 30; 31.5%&gt;30</th>
<th>Smoking: 6.9% current, 30.1% former, 63.1% never</th>
<th>-p&lt;0.0001</th>
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Reyes-Velázquez & Sealy-Potts (2015)  
To examine the relationship between unrealistic optimism, sex and risk perception of type 2 diabetes in college students  
USA  
N=652  
21.5% reported having a blood relative with diabetes in their nuclear family.  
57.9% reported having a blood relative with diabetes in their extended family.  
Demographic characteristics of the participants with family history of diabetes are not presented  
Cross-sectional, questionnaire  
“Based on your family background, do you think you are at risk of developing type 2 diabetes in your lifetime?” (3-point scale: I am at great risk of developing type 2 diabetes; I am at some risk of developing type 2 diabetes; I am at no risk of developing type 2 diabetes)  
Participants who reported having a blood relative with diabetes in their nuclear family had a moderately high risk perception (M=6.58, p=0.000)
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| Cullen & Buzek (2009)            | To assess type 2 perceptions and risk factor awareness among African American and Hispanic families with a history of diabetes. | USA          | Relatives of people with type 2 diabetes  
Adolescents and parents with a family history of diabetes:  
N=39 parents and 21 adolescents  
DEMOGRAPHICS  
Age: not specified  
adolescents: (ninth and tenth graders)  
Gender: adolescents: 71% female; parents: 95% female  
Ethnicity: adolescents: 43% African American, 57% Hispanic; parents: 49% African American; 51% Hispanic  
BMI: 33% of the adolescents and 79% of the parents had BMI>25 | Descriptive, interviews, open-ended questions | Diabetes risk perception: 78% of parents reported their risk correctly. 8 parents did not believe they are at risk. 59% felt their children were at risk. |
| Pijl, Henneman, Claassen, Detmar, Nijpels & Timmermans (2009) | To explore the perceptions of risk with regard to diabetes and the role of family history among people at an increased risk for | The Netherlands | Relatives of people with type 2 diabetes  
N=9 people with family history of diabetes  
DEMOGRAPHICS  
Affected relatives: 1 to 4 | Exploratory, qualitative, semi-structured interviews | Perceived risk  
4 (9) participants perceived a slightly higher risk when comparing themselves to |
| Gordon, Walker & Carrick-Sen (2013) | To understand the knowledge and perceptions of type 2 diabetes | UK | Relatives of people with type 2 diabetes  
N=6 offspring of patients with type 2 diabetes  
**DEMOGRAPHICS**  
Age: 21-38  
Gender: 4 male, 2 female  
**Weight status:** 2 obese, 2 overweight, 2 healthy weight  
**Education:** mixture  
**Work background:** most were from working or lower middle class  
**Ethnicity:** White  
Exploratory qualitative study, semi-structured one-to-one interviews, thematic framework analysis  
**Family history of diabetes:** recruited people with type 2 diabetes and asked them to pass information on to relatives  
**Risk:** Three participants believed their risk is the same as the general population and three believed it was higher.  
There was no correlation between perceived risk and weight status. **Loading the dice:** those who believed to be at increased risk examined different lifestyle and family risk factors. Those who believed to be at the same risk as the people of the same age. Some people with family history of diabetes did not perceive themselves to be at risk. Despite risk awareness, a lot of people did not worry about getting diabetes. | type 2 diabetes | among first- and second-degree relatives  
**Age:** mean=67, range 62-72  
**Gender:** 6 female, 3 male  
**Education:** approx. a quarter were highly educated |
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|---|---|---|---|---|
| general population offset negative lifestyle factors with positive behaviours. Of those who rated themselves at increased risk, where the onset of type 2 diabetes was deemed inevitable, the time to onset was postponed to an age similar to that of their parents’ diagnosis |