

Perceiving Need for Lifestyle Counseling

Findings from Finnish individuals at high risk of type 2 diabetes

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OBJECTIVE—To investigate the proportion of individuals at high risk of type 2 diabetes who perceive the need for lifestyle counseling, factors associated with this perception, and whether the perceived need is associated with subsequent attendance in lifestyle intervention.

RESEARCH DESIGN AND METHODS—Baseline and intervention data were obtained from 10,149 participants in a Finnish National Diabetes Prevention Project.

RESULTS—In total, 36% of men and 52% of women perceived the need for counseling. Most of the risk factors did not increase the perceived need for counseling. Those agreeing to attend supervised lifestyle intervention were more likely to report a perceived need than those who agreed on a self-initiated lifestyle change or those who refused to attend lifestyle intervention. The perceived need was associated with actual attendance in the lifestyle intervention only among women.

CONCLUSIONS—It will be vital to find additional means to support lifestyle change.

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Most individuals at high risk of type 2 diabetes intend to and attempt to change their lifestyle (1–3). In previous studies, however, only 16% of high-risk individuals were motivated to enroll in an intervention program (4), whereas 46% agreed to participate in lifestyle intervention (5). Hence, our research questions were:

1. What proportion of individuals perceive the need for lifestyle counseling (LC)?
2. What are the predictors of perceived LC need?
3. Is there an association between perceived LC need and *i*) agreement to participate in supervised intervention, *ii*) agreement on a self-initiated lifestyle

change, and *iii*) refusal to participate in the intervention?

4. Among those agreeing to participate in supervised intervention, is there an association between perceived LC need and actual attendance/nonattendance in the intervention?

RESEARCH DESIGN AND METHODS

Data were obtained from adults at high risk of type 2 diabetes participating in a Finnish National Diabetes Prevention Project, FIN-D2D (6–11). Within the project, individuals participated voluntarily in one or two health check-ups. Thereafter, intensified LC interventions were offered, and the participant and the nurse agreed together on the most suitable form of intervention.

The baseline data were drawn from 10,149 initial respondents during 2004–2008 (9). Respondents with diabetes and those with no glucose tolerance test at baseline were excluded, leaving 7,128 individuals in the analysis. The baseline data were obtained from questionnaires filled in by participants and nurses. Intervention visit data ($n = 3,620$) were collected via a form completed by health professionals.

The dependent variable was the perceived need for LC, assessed with the question, “Do you need support, counseling, or more information to help you achieve certain lifestyle changes (e.g., diet, exercise, etc.)?” The response options were yes/no (for explanatory variables see Table 1). For research question 2 we categorized participants into those who *i*) agreed to participate in supervised intervention (i.e., group or individual intervention, within or outside public health care), *ii*) agreed on a self-initiated lifestyle change, *iii*) did not agree to participate in any intervention. On the basis of the subsequent intervention data, the participants were further categorized into those who *a*) did not subsequently attend the intervention within public health care, and those who *b*) subsequently attended the intervention at least once. Bivariate analysis and multivariate logistic regression were applied.

RESULTS—In total, 52% of women but only 36% of men reported a perceived need for LC (unadjusted odds ratio [OR] 1.93, $P < 0.001$; adjusted OR 1.91, $P < 0.001$). Participants aged younger than 65 years were more likely to perceive LC need than those aged at least 65 years. Nonmanual workers and retired people were more likely to perceive LC need than manual workers and unemployed people. Those at the contemplation, preparation, and action stages were more likely to perceive LC need than those at the precontemplation and maintenance stages. Unmarried and noncohabiting men were more likely to perceive LC need than married and cohabiting men. Among women, higher levels of education, $\text{BMI} \geq 30 \text{ kg/m}^2$, having dyslipidemia, and being a nonsmoker increased the likelihood of perceiving LC need (Table 1).

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Perceiving need for LC

Table 1—Multivariate logistic regression model on perceived need for lifestyle counseling among adults at high risk of type 2 diabetes (n = 7,128) by selected variables

Variables (under four categories)	Classification	Men*		Women*	
		OR (95% CI)	P	OR (95% CI)	P
Factors that cannot be changed					
Family history of diabetes	No	1		1	
	Yes	1.00 (0.79–1.25)	0.967	1.11 (0.91–1.36)	0.295
Age (years)	≤45	1		1	
	45–54	0.92 (0.66–1.28)	0.621	1.06 (0.79–1.42)	0.712
	55–64	1.14 (0.78–1.66)	0.497	1.02 (0.74–1.42)	0.893
	≥65	0.52 (0.35–0.78)	<0.01	0.70 (0.51–0.97)	<0.05
Factors that can be changed					
Marital status	Married/cohabiting	1		1	
	Others	1.37 (1.05–1.80)	<0.05	0.92 (0.74–1.13)	0.412
Educational level	Low	1		1	
	Medium	1.12 (0.87–1.45)	0.388	1.56 (1.25–1.93)	<0.001
	High	1.19 (0.75–1.87)	0.458	1.78 (1.24–2.56)	<0.01
Occupational status	Manual	1		1	
	Nonmanual	2.31 (1.71–3.13)	<0.001	1.66 (1.17–2.36)	<0.01
	Retired	1.52 (1.08–2.14)	<0.05	1.59 (1.08–2.34)	<0.05
	Not employed	1.37 (0.86–2.18)	0.186	1.45 (0.97–2.18)	0.074
Risk factors and diseases					
BMI (kg/m ²)†	Normal (≤24.9)	1		1	
	Overweight (25–29.9)	1.14 (0.63–2.05)	0.665	1.63 (0.98–2.72)	0.062
	Obese (≥30)	1.18 (0.63–2.22)	0.606	2.60 (1.53–4.42)	<0.001
Waist circumference (cm)†	Ideal (men ≤94; women ≤80)	1		1	
	Elevated (94–101; 80–87)	1.10 (0.65–1.89)	0.719	1.10 (0.52–2.33)	0.811
	Large (≥101; ≥88)	1.55 (0.89–2.70)	0.119	1.30 (0.60–2.80)	0.512
Hypertension	No	1		1	
	Yes	1.01 (0.81–1.26)	0.930	1.00 (0.81–1.21)	0.904
Dyslipidemia	No	1		1	
	Yes	1.13 (0.91–1.41)	0.275	1.31 (1.07–1.60)	<0.05
Vascular risk factor/disease	No	1		1	
	Yes	1.10 (0.82–1.48)	0.513	0.95 (0.69–1.32)	0.771
Variables related to lifestyle					
Leisure time physical activity	Active	1		1	
	Inactive	1.15 (0.90–1.48)	0.258	1.18 (0.96–1.46)	0.116
Smoking	No smoking	1		1	
	Regular/occasional	0.83 (0.64–1.09)	0.185	0.75 (0.58–0.97)	<0.05
Fruit and vegetable intake	≥4 daily portions	1		1	
	≤2 daily portions	0.76 (0.51–1.15)	0.199	0.83 (0.67–1.03)	0.094
Alcohol intake	Normal	1		1	
	Risk consumption	0.91 (0.59–1.42)	0.681	1.75 (0.81–3.77)	0.153
Stages of change for weight loss	Maintenance	1		1	
	Action	2.06 (1.22–3.48)	<0.01	2.93 (1.60–5.36)	<0.01
	Preparation	2.24 (1.35–3.71)	<0.01	4.62 (2.58–8.28)	<0.001
	Contemplation	1.89 (1.10–3.12)	<0.05	4.49 (2.47–8.16)	<0.001
LC previously received	Precontemplation	0.86 (0.41–1.79)	0.679	1.91 (0.88–4.16)	0.102
	No	1		1	
	Yes	0.90 (0.70–1.14)	0.377	0.97 (0.79–1.20)	0.791

Adjusted ORs for perceiving the need for counseling are presented. *The categories were adjusted by other categories (i.e., category 1 was adjusted by categories 2, 3, and 4; category 2 was adjusted by categories 1, 3, and 4, and so on). †Reported by a health professional (others were reported by the high-risk individual).

Overall, a perceived need for LC was reported by 55% of women and 38% of men who agreed to participate in the supervised lifestyle intervention, by 35% of women and 24% of men who agreed on a self-initiated lifestyle change, and by

37% of women and 34% of men who refused to participate in the lifestyle intervention. Those agreeing to participate in the supervised intervention were more likely to have reported a perceived need for LC than those agreeing on a self-initiated

change (women: OR 2.09, $P < 0.001$; men: OR 1.98, $P < 0.01$). The difference between participants agreeing on a self-initiated change and those refusing to participate in any intervention was not significant (women: OR 1.01, $P = 0.955$;

men: OR 1.59, $P = 0.060$). Of those who agreed to attend supervised lifestyle intervention within public health care, 72% of men and 73% of women actually attended at least once. Attending and nonattending men were equally likely to have reported a perceived need for LC (36 vs. 36%, $P = 0.996$; OR 1.12, $P = 0.219$). By contrast, attending women were more likely to have reported a perceived need for LC than nonattending women (59 vs. 46%, $P < 0.001$; OR 1.45, $P < 0.001$).

CONCLUSIONS—The observations pose challenges in the field of diabetes prevention. Overall, 36% of the men and 52% of the women participating in FIN-D2D perceived a need for LC. The proportions appear fairly low. Most of the risk factors do not seem to significantly increase the perceived need of high-risk individuals for LC. However, our results suggest that women who smoke, have dyslipidemia, or are obese may be receptive to LC. Furthermore, individuals at the contemplation, preparation, and action stages seem to have the strongest perceptions of LC need, confirming recommendations that health professionals should assess the individual's readiness to change and tailor counseling to match the person's stage of change (12). Nevertheless, professionals' expectations concerning the individual's subjective need for LC should not be based purely on the individual's stage of change. As many as 42% of women and 60% of men at the contemplation and preparation stages saw *no* need for LC, yet a quarter of the individuals at the precontemplation stage *did* perceive a need for LC, even though these people are usually regarded as unwilling or unready for lifestyle change.

The proportions of individuals who perceived the need for LC but who agreed only on a self-initiated lifestyle change (30%) or refused to participate (35%) were higher than expected. We also expected that those who actually attended the LC intervention would be more strongly represented among those who had perceived the need for LC; however, this was the case only among women. Moreover, the overall proportion of those who perceived the need for LC but who did not thereafter attend lifestyle intervention was quite high, among both men (36%) and women (46%). If we wish to promote the LC attendance of high-risk persons, we have to understand also the reasons for nonattendance.

The study had limitations. Our results on perceived LC need and on the

initially agreed and actual participation might actually give too positive a picture regarding the broader Finnish high-risk population due to selection bias. There could also be other factors explaining the perceived need for LC (e.g., depression and limitations in physical functioning) that we did not include in the study.

Altogether, preventing diabetes would seem to require action from policy makers in all sectors and at all levels, not just from the health care system. Finding additional means to support lifestyle change processes will be very important.

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S.M.S. drew up the study plan, researched the data, and wrote the manuscript. K.A.V. devised the study plan, researched the data, and reviewed and edited the manuscript. J.J.V. researched and processed the original data, performed the statistical analysis, supported the interpretation of the results, and edited the manuscript. M.J.V., T.E.S., J.L., H.H.O., E.A.-L.K.-H., L.M., and S.K.-K. accepted the study plan and reviewed and edited the manuscript. M.E.P. devised the study plan, researched the data, and reviewed and edited the manuscript. The FIN-D2D Study Group and FIN-D2D Steering Committee were in overall charge of FIN-D2D conception and design and the acquisition of data.

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References

1. Rolka D, Li Y. Self-reported prediabetes and risk-reduction activities – United States, 2006. *JAMA* 2009;301:591–593
2. Lewis SJ, Rodbard HW, Fox KM, Grandy S; SHIELD Study Group. Self-reported prevalence and awareness of metabolic syndrome: findings from SHIELD. *Int J Clin Pract* 2008;62:1168–1176
3. Hivert MF, Warner AS, Shrader P, Grant RW, Meigs JB. Diabetes risk perception and intention to adopt healthy lifestyles among primary care patients. *Diabetes Care* 2009;32:1820–1822
4. Ruge T, Nyström L, Lindahl B, et al. Recruiting high-risk individuals to a diabetes prevention program: how hard can it be? *Diabetes Care* 2007;30:e61
5. Pinelli NR, Herman WH, Brown MB, Jaber LA. Perceived risk and the willingness to enroll in a diabetes prevention lifestyle intervention in Arab-Americans. *Diabetes Res Clin Pract* 2010;90:e27–e29
6. Finnish Diabetes Association 2006. Implementation of Type 2 Diabetes Prevention Plan: Project Plan 2003–2007, FIN-D2D Project [article online]. Available from http://www.diabetes.fi/files/1107/Implementation_of_Type_2_Diabetes_Prevention_Project_Plan_2003-2007.pdf. Accessed 15 December 2011.
7. Saaristo T, Peltonen M, Keinänen-Kiukaanniemi S, et al; FIN-D2D Study Group. National type 2 diabetes prevention programme in Finland: FIN-D2D. *Int J Circumpolar Health* 2007;66:101–112
8. Finnish Diabetes Association 2009. Loppuraportti Dehkon 2D -hanke (D2D) 2003–2007. 2007 [Final Project Report of FIN-D2D]. Suomen Diabetesliitto [article online]. Available from http://www.diabetes.fi/files/271/Dehkon_2D_hankeen_D2D_loppuraportti_pdf_2_5_Mt.pdf. Accessed 15 December 2011.
9. Saaristo T, Moilanen L, Korpi-Hyövälti E, et al. Lifestyle intervention for prevention of type 2 diabetes in primary health care: one-year follow-up of the Finnish National Diabetes Prevention Program (FIN-D2D). *Diabetes Care* 2010;33:2146–2151
10. Saaristo T, Moilanen L, Jokelainen J, et al. Cardiometabolic profile of people screened for high risk of type 2 diabetes in a national diabetes prevention programme (FIN-D2D). *Prim Care Diabetes* 2010;4:231–239
11. Saaristo TE, Barengo NC, Korpi-Hyövälti E, et al. High prevalence of obesity, central obesity and abnormal glucose tolerance in the middle-aged Finnish population. *BMC Public Health* 2008;8:423
12. Prochaska J, Norcross J. *Systems of psychotherapy – a transtheoretical analysis*. 5th ed. Los Angeles, Thomson Learning, 2003.