Distress as a Risk Factor for Type 2 Diabetes: An Integrative Review

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Purpose
Identify the state of the science for the relationship between distress and insulin resistance (IR), a precursor to the development of type 2 diabetes mellitus (T2DM).

Research Questions
What is the methodological rigor of studies focused on distress and IR?

What is the relationship between distress, as defined by distressing work stress, and IR?

How can distress be effectively defined to expand the results on IR and the development of T2DM?

Methods
Databases: Cumulative Index to Nursing and Allied Health Literature (CINAHL), Google Scholar, Ovid, and PsycInfo.

Exclusion terms for Google Scholar: Oxidative, endoplasmic, secretory, infancy, mice, rats, and adolescents.

Keywords: Distress, depression, stress, psychosocial stress, insulin, prediabetes, diabetes prevention, and IR.

Over 1,600 articles were screened.

The first 200 articles resulting from a search were screened.

Only full text articles were reviewed.

Results

Depression (3, 8)
- increased the risk for T2DM by at least 66% in women (OR=1.66, 95% CI [1.05-2.61], p=0.03)
- Risk for T2DM greater than 2-fold for African-Americans (OR=2.56, 95% CI [1.27-5.25], p=0.008)

The odds of developing T2DM when controlling for age, gender, level of socioeconomic status, and BMI was greater than 2-fold (OR=2.5, 95% CI [1.29-4.87]).

Insomnia (10)
- Men with insomnia had higher fasting glucose levels than women (p=0.03).
- Women who took greater than 30 minutes to fall asleep showed significantly higher fasting insulin levels and greater insulin resistance than those who fell asleep within 10 minutes (b=0.26, 95% CI 0.0001 and b=0.01, p<0.03, respectively).

Insomnia & Depression (2)
- A large proportion of women had greater distress than men (n=823, 25% and n=202, 8%, respectively).
- Men with high distress scores were more likely to develop T2DM while women with moderate to high distress scores were more likely to develop pre-diabetes (OR=2.2, 95% CI [1.24-4.1] and OR=1.8, 95% CI [1.1-3.8], respectively).

Readiness for Change (4, 8)
- Despite lifestyle improvements, 58% of subjects (n=176) remained pre-diabetic or developed T2DM after six months.
- Subjects from low socioeconomic status believed they had less ability to deal with barriers that challenge lifestyle change (p<0.08).

Smoking (12)
- Ex-smokers and current smokers have greater insulin resistance than non-smokers (p<0.001).
- Smoking greater than 10 cigarettes per day increased the risk for pre-diabetes by more than twofold (OR=2.63, 95% CI [2.04-3.39], p<0.001).

Work stress (1, 5)
- Men and women in entry level, lower grades of employment were more likely to develop the metabolic syndrome (p<0.05 and p<0.01, respectively).
- Associated with a 60% higher risk of developing T2DM in women (p=0.019).

Increased further if working in isolated conditions with limited social support (OR=1.94, 95% CI [1.57-2.31], p<0.001).

An individual’s response to a stressor would depend on multiple factors such as previous experiences with similar stressors and the ability to adapt to such experiences” – Sister Callista Roy

Conclusion & Implications
The IR produced by distressing factors may be a risk factor for the development of T2DM.

A common term used to describe any number of distinguishing factors would benefit researchers investigating the relationship between distress and IR or the development of T2DM.

References
9) Rancho Bernardo Study. Rancho Bernardo Study. doi:10.1136/bmj.38693.45501.80

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