Psychosocial determinants of health

Social Epidemiology

11 March 2022

RECETOX, MUNI

Learning objectives

By the end of this session, the students should be able to:

- Define psychosocial factors of health

- Understand the mechanisms through which the psychosocial factors affect health

- Give examples of the main psychosocial factors

- Identify some of the health outcomes that are affected by the psychosocial factors of health

- Critically examine the evidence that links the psychosocial factors with adverse health outcomes

What do we mean by "psychosocial"?

Definition

• Oxford dictionary

"Pertaining to the influence of the social factors on an individuals mind and behaviour and to the interrelation between behavioural and social factor"

Implication for social epidemiology based on this definition:

➤Psychosocial factors mediate the effects of the broader social structures on health

➤They may present independent risk factors

Martikainen and Bartley (2002)

Independent risk factors

Psychosocial risk factors as independent risk factors

- Psychological factors:
    - Distress
    - anxiety
    - depression
- Personality traits
    - Locus of control
    - Mastery, perceived control
   - Type A personality
    - Neuroticism

May **act independently from SES and affect all SE groups**

Proportions of survivors 1 SD below the mean, the average range, and those >1 SD above the mean for neuroticism scale.
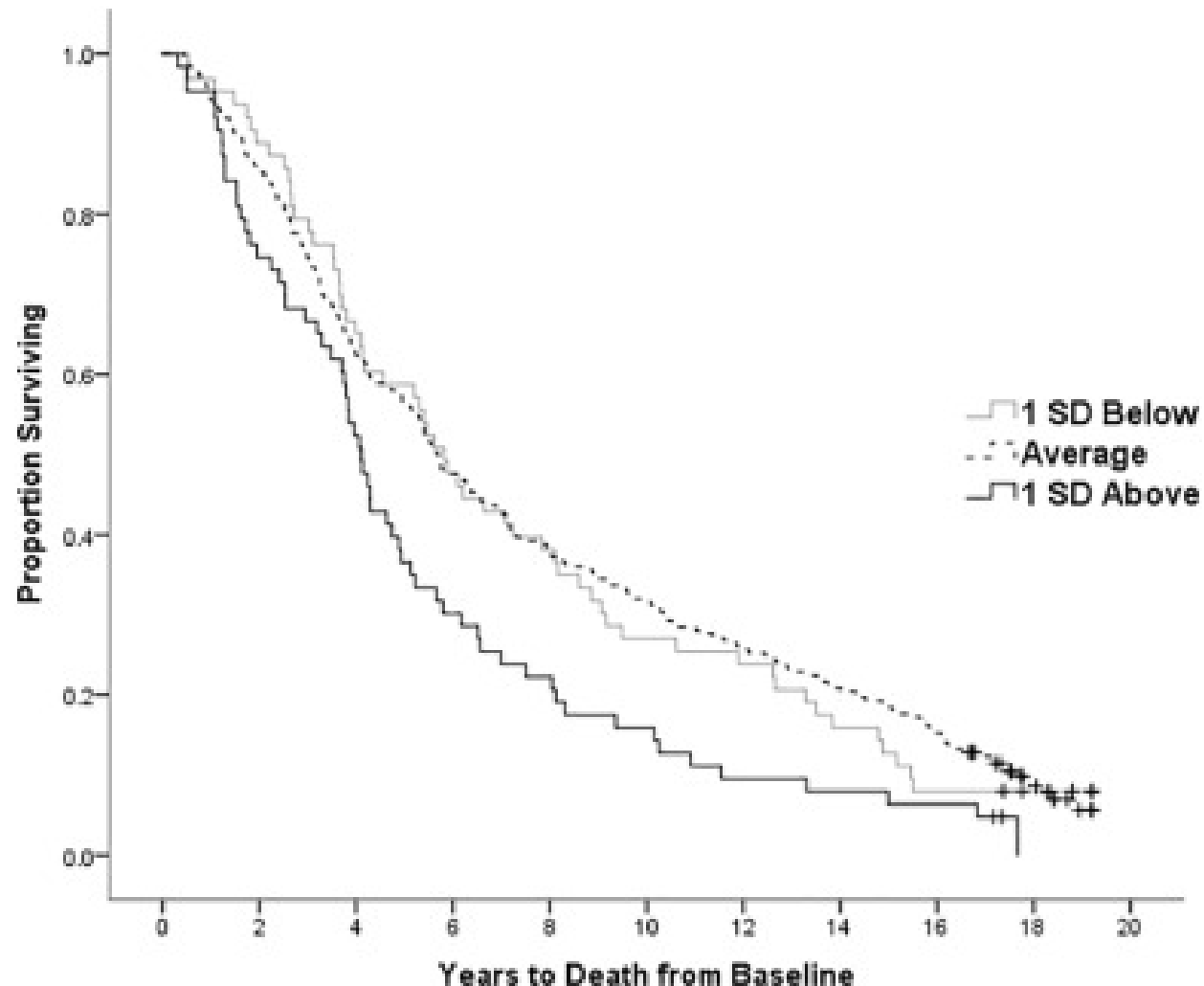
O'Suilleabhain & Hughes, J Psychosom Res, 20187

More severe depressive symptoms associated with a higher risk of death (ELSA, age adjusted and fully adjusted models)
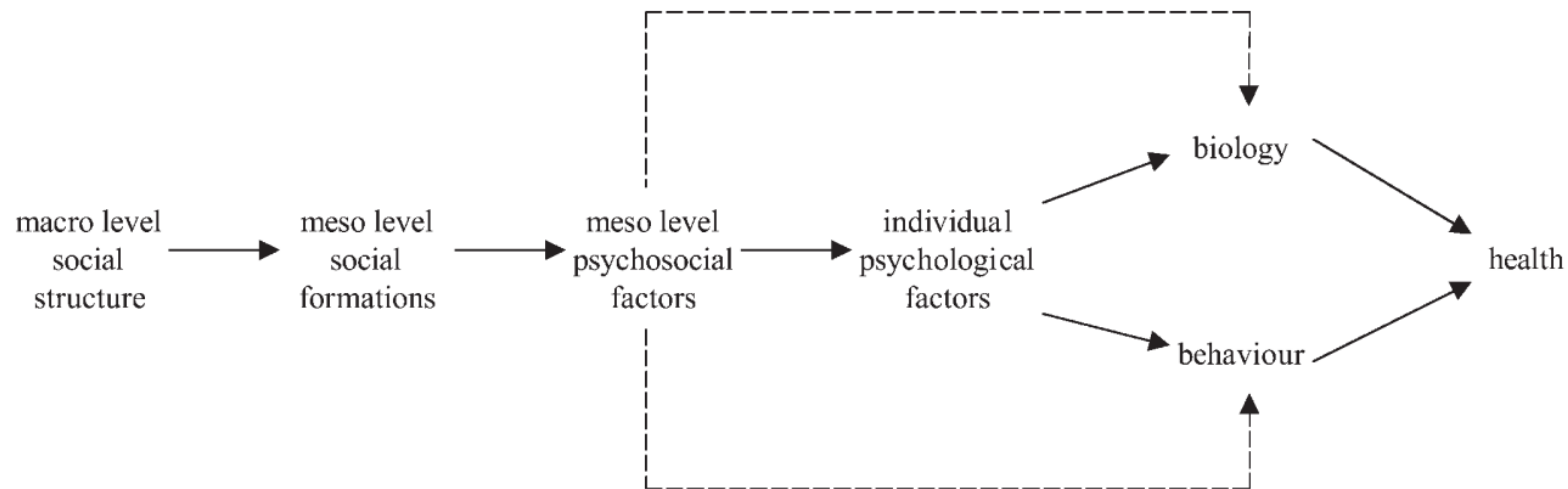

(White et al, Psychol Med 2015)
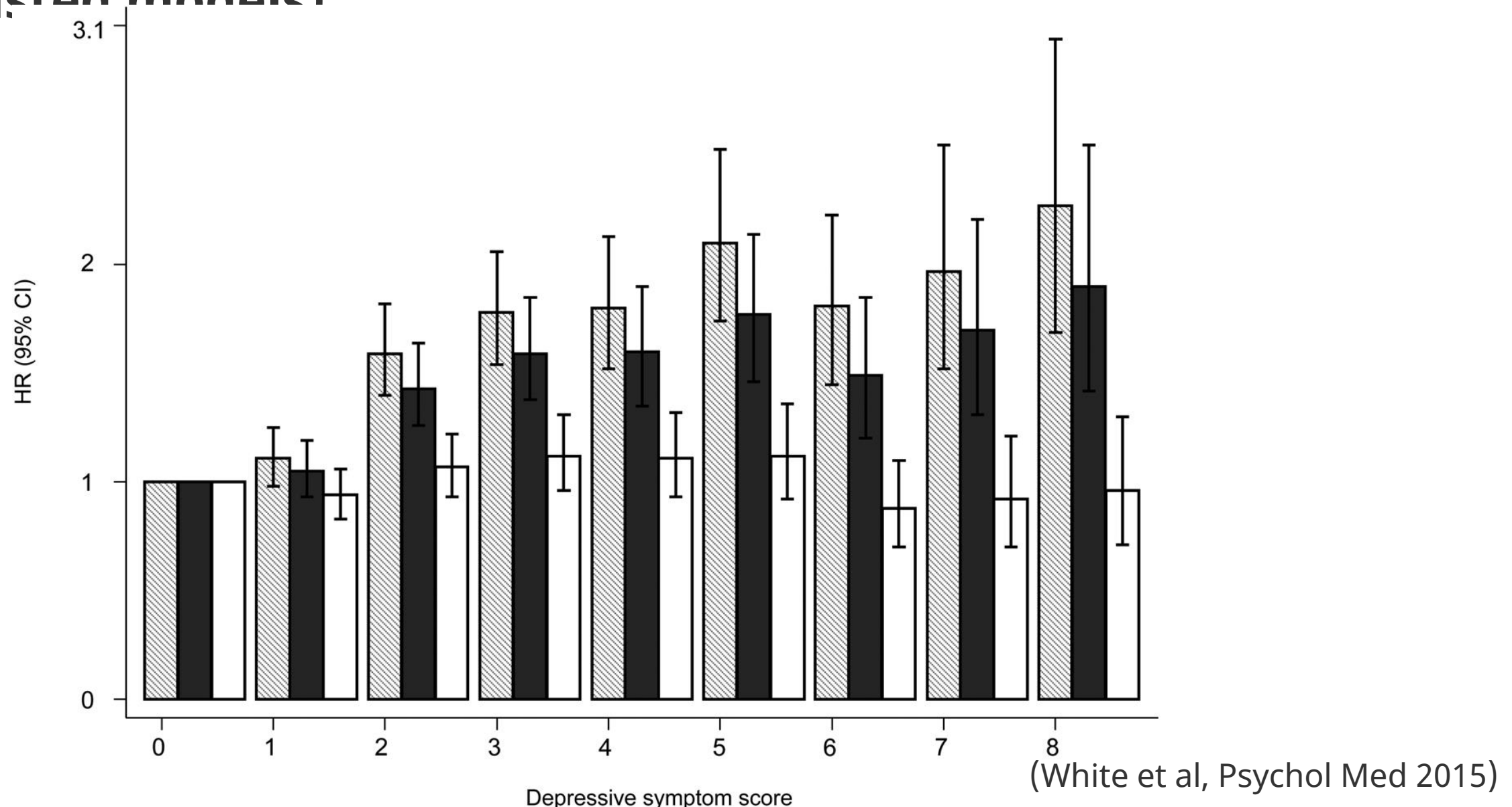
Mediators of wider social environment

Definition of concept

- *"…psychosocial factors (are) any exposure that may influence a physical health outcome through a psychological mechanism."* *(Macleod and Smith, 2003)*

Figure 1 A tentative schematic representation of psychosocial pathways

Getting the concept right

Public Health England

UCL Institute of Health Equity

Psychosocial pathways and health outcomes: Informing action on health inequalities

"Psychosocial pathways are significant in **mediating the effects of social determinants** (social, environmental, economic, political and cultural factors) on health."

THE RELATIONSHIP OF PSYCHOSOCIAL FACTORS TO CORONARY HEART DISEASE IN THE FRAMINGHAM STUDY: I. METHODS AND RISK FACTORS   Get access >

SUZANNE G. HAYNES ✉, SOL LEVINE, NORMAN SCOTCH, MANNING FEINLEIB, WILLIAM B. KANNEL

American Journal of Epidemiology, Volume 107, Issue 5, May 1978, Pages 362–383,

https://doi.org/10.1093/oxfordjournals.aje.a112556

Published: 01 May 1978   **Article history** ▾

Psychosocial factors as **independent risk factors** for certain health outcomes

The psychosocial model of social inequalities

Psychosocial model

- Emphasises the importance of relative or perceived disadvantage

- Focusing exclusively on the distribution of material resources would not explain all differences in health outcomes.

  - *"If, in the spirit of neo-materialism, you give every child access to a computer and every family a car, deal with air pollution, and provide a physically safe environment, is the problem solved? We believe not." (Marmot and Wilkinson, 2001)*

Figure 1. Geometric means for Agatston scores in the higher (solid bars), intermediate (striped bars) and lower (open bars) grade of employment groups (n = 293).

Note: Lower score – lower calcium deposit in the heart – lower risk of heart failure
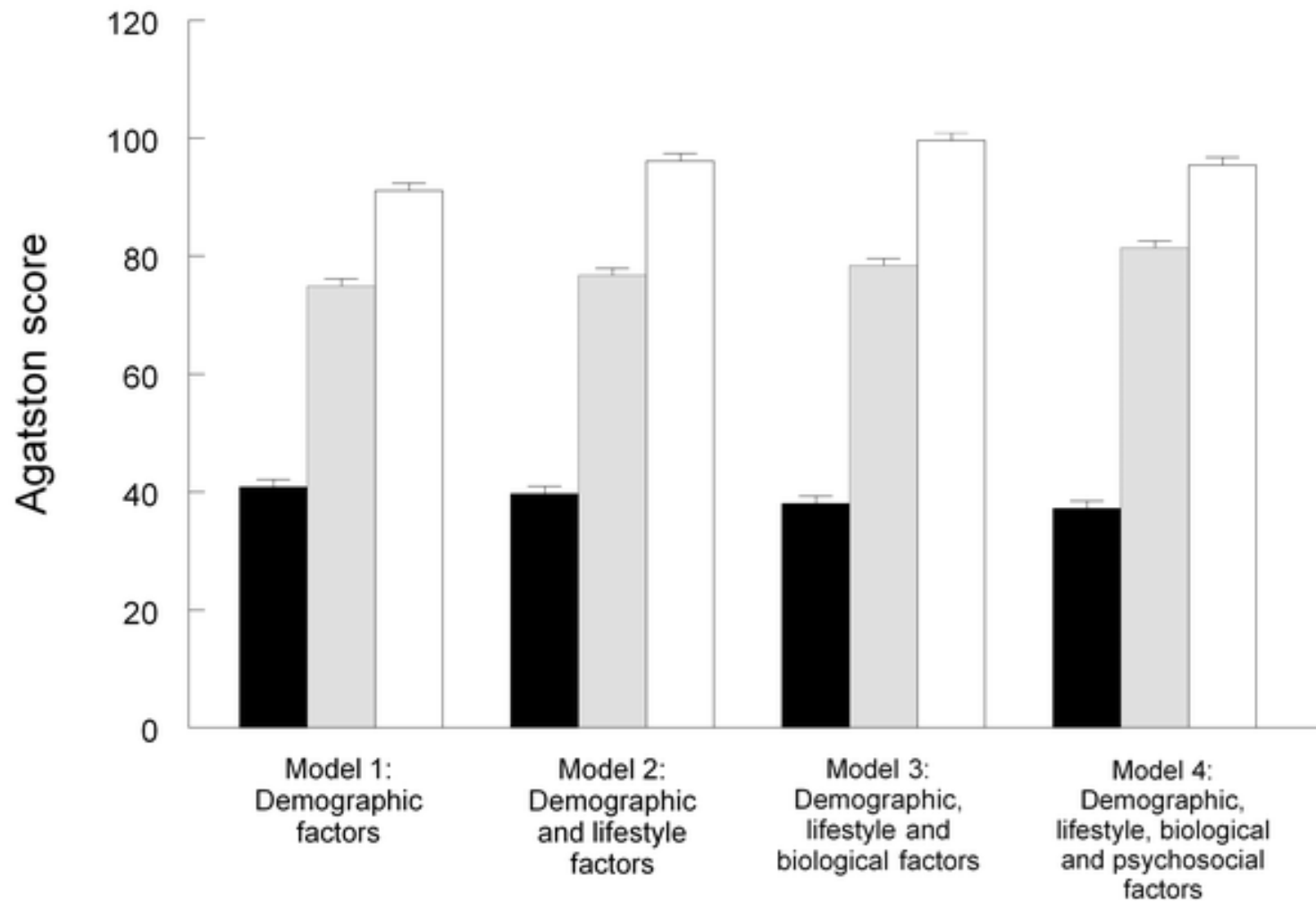
Can psychosocial factors explain the social gradient in health?

Steptoe A, Hamer M, O'Donnell K, Venuraju S, Marmot MG, et al. (2010) Socioeconomic Status and Subclinical Coronary Disease in the Whitehall II Epidemiological Study. PLOS ONE 5(1): e8874. https://doi.org/10.1371/journal.pone.0008874
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0008874

Material, behavioural and psychological pathways
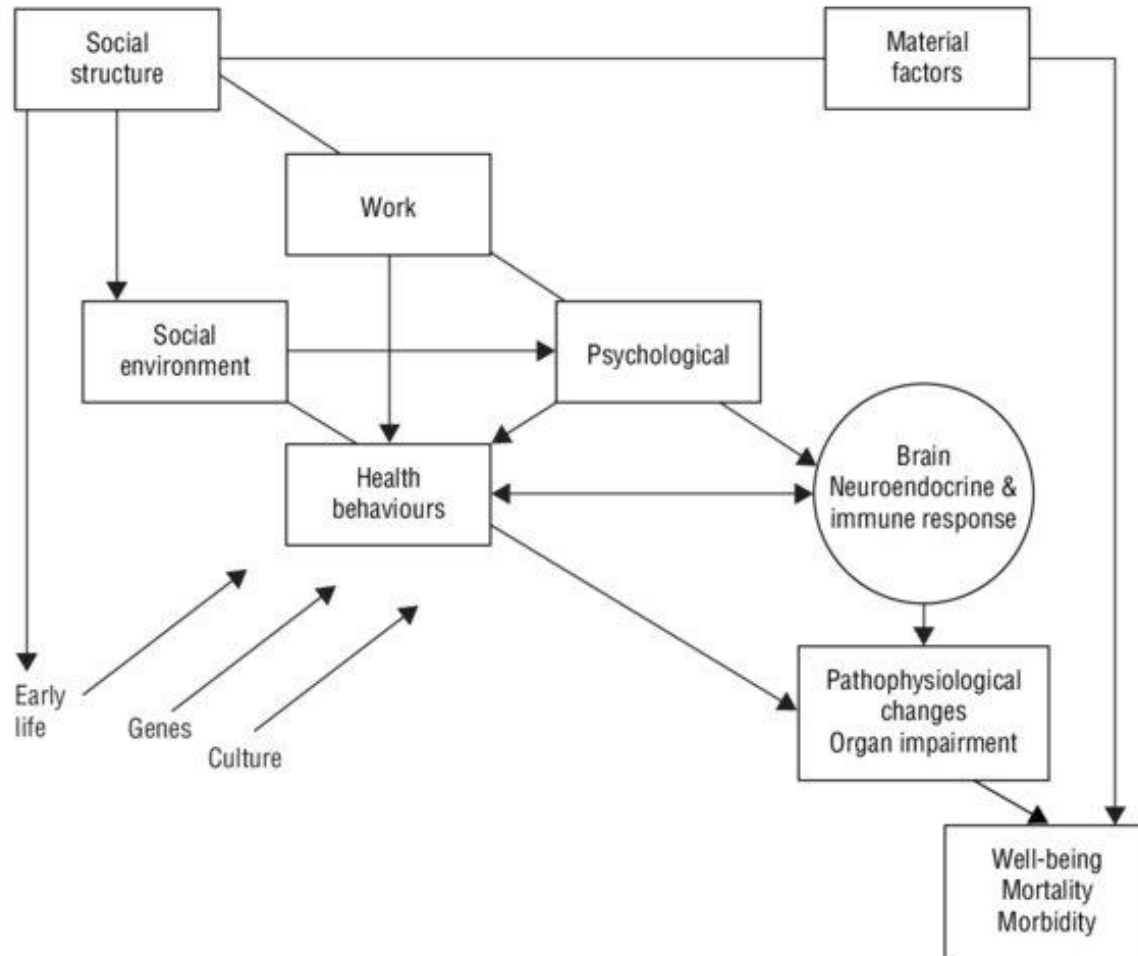
"A psychosocial factor may be defined as a measurement that potentially relates psychological phenomena to the social environment and to **pathophysiological changes**"

Source: Brunner and Marmot 1999.

Mechanisms

- Two main "response circuits"

  1. Sympathetic Adrenal-Medullary Axis (SAM)
     - Involves the release of nor-adrenaline
     - Fibrinogen, heart rate, blood pressure etc.

  2. Hypothalamic-pituitary-adrenocortical
  - Cortisol
    - Atheroma – fat and sugar build up in the blood
    - Stress induced damage to the metabolism – allostatic load
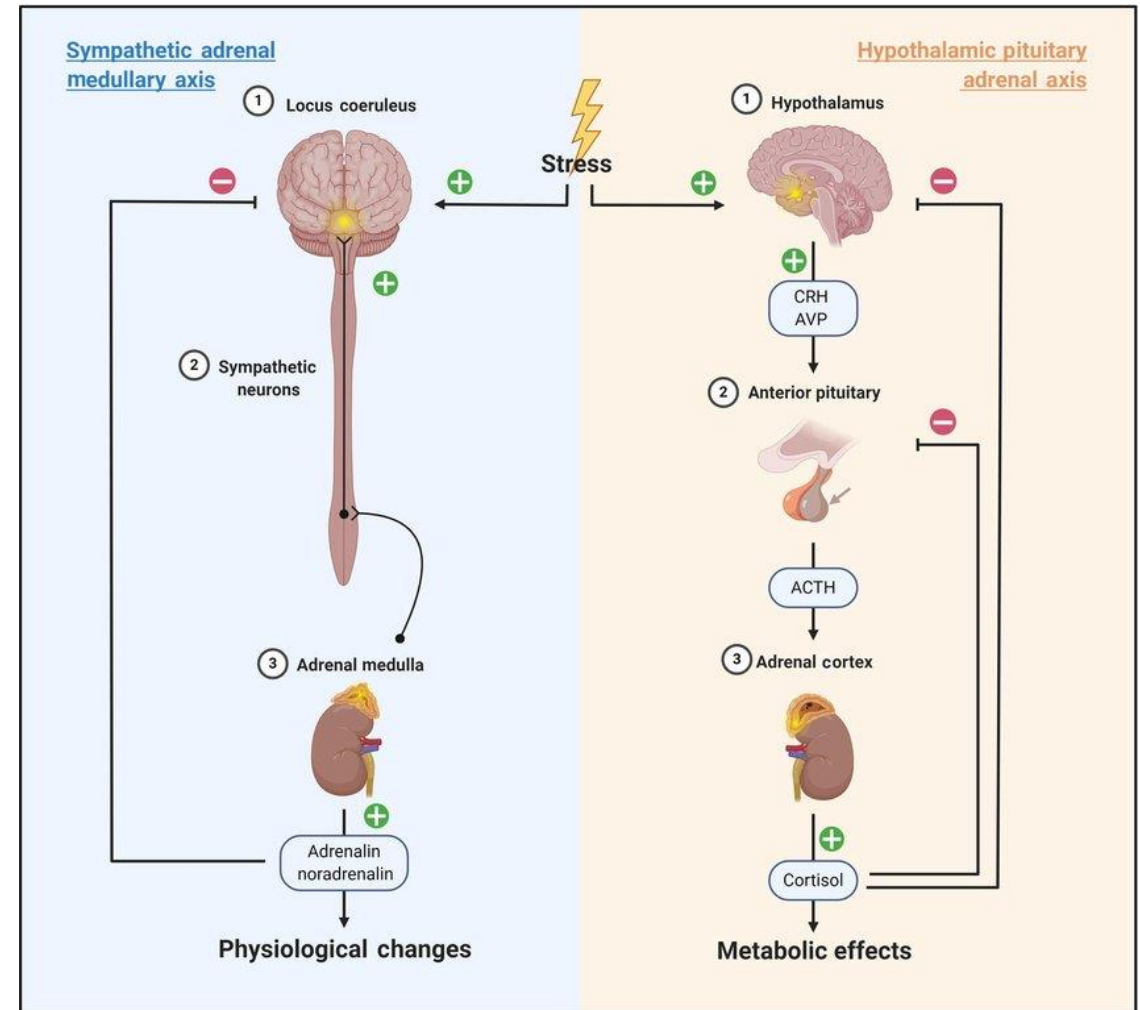
Examples of psychosocial factors and their impact on health conditions

Examples of psychosocial factors

- 3 main domains where psychosocial factors operate
    - Home
    - Work
    - Community

  *Individual level – personality traits (Type A personality)

- Some examples of "adverse psychosocial exposure" or "misery"
    - Lack of social support
    - Loneliness
    - Marital and domestic relationships
    - Isolation
    - Bereavement
    - Social disruption
    - Hostility
    - Work stress
    - Psychological distress
    - Exposure to discrimination
    - Exposure to community violence
    - Perceived lack of control
    - Perceived injustice

Psychosocial factors and health impacts

A. Unhealthy behaviours

B. Cardiovascular Disease

C. Type II Diabetes

D. Mental Health

E. Cancer

Psychosocial factors and health impacts

American Journal of
Preventive Medicine

RESEARCH ARTICLE

Association of Psychosocial Factors With Risk of
Chronic Diseases: A Nationwide Longitudinal Study
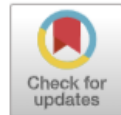
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A. Psychosocial factors and health behaviours

Explanation for unhealthy behaviours- Behavioural or structural?

"Social injustice is killing people on a grand scale."

WHO Commission on the Social Determinants of Health (2008)

"A fat glutton can hardly blame a cruel society or liberal trade policies for his predicament"

The Economist (2008)

A. Psychosocial factors and health behaviours

Is there a psycho-social expla[nation]
between social groups?

- Locus of control?
  - Internal vs external
- Mediating role of stress?

Figure 8: Child overweight and obesity, by Index of Multiple Deprivation (2017 and 2018)

Base: Aged 2 to 15

Per cent

■ Obese   ■ Overweight, not obese

Index of Multiple Deprivation (IMD)

Health Survey for England 2018

Source: NHS Digital
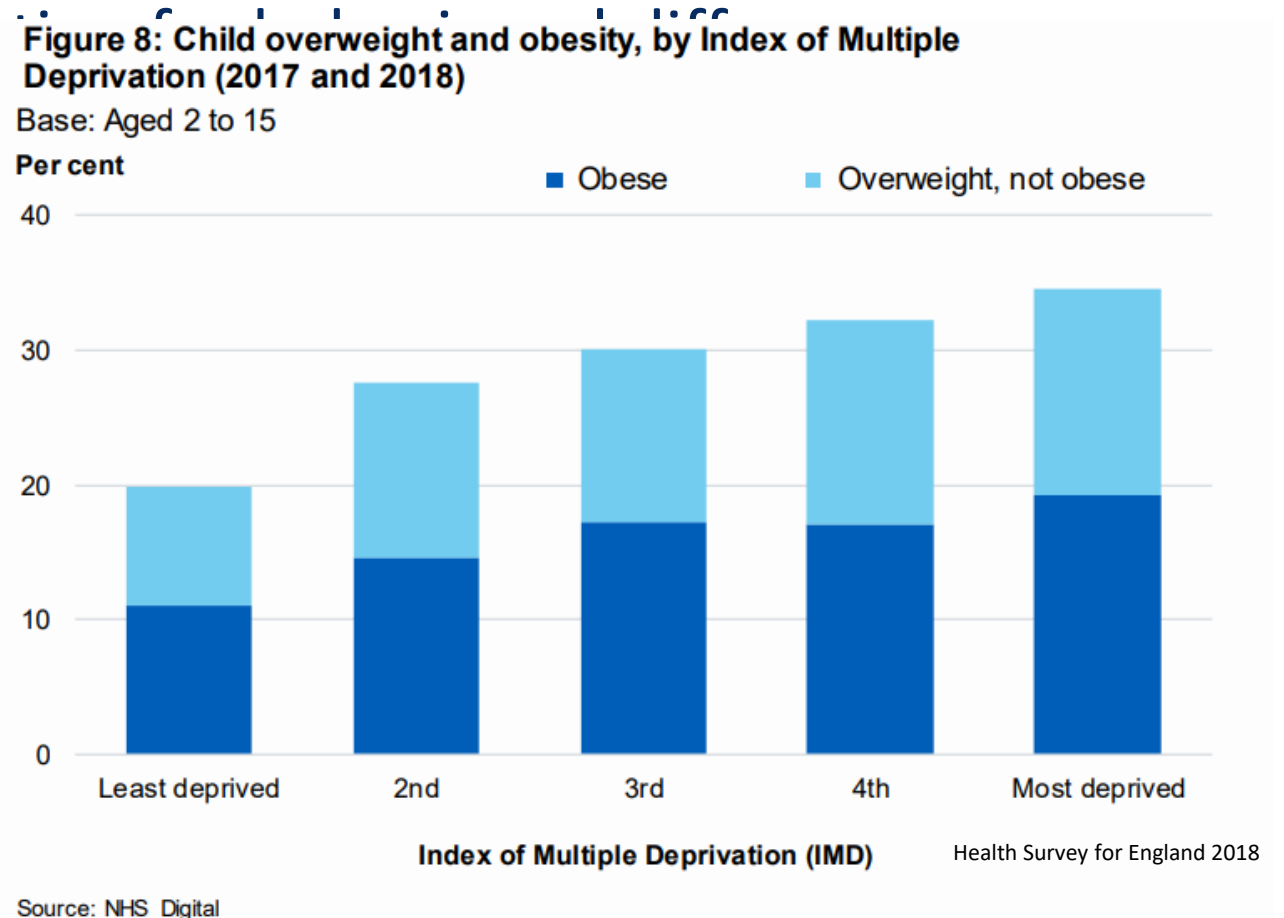
A. Psychosocial factors and health behaviours

Table 4 MLR analyses of longitudinal associations between T1 stress and behavioural outcomes at T2

T2 outcomes[a]	β[b]	B[c]	(95% CI)	P
BMI	**0.04**	**0.09**	**(0.04, 0.13)**	**<0.0005**
		OR	**(95% CI)**	**P**
BMI category				
Healthy weight (18.5–24.9 kg m^{-2})				
Overweight (25.0–29.9 kg m^{-2})		1.02	(0.97,1.08)	0.454
Obese (BMI 30.0 kg m^{-2} or more)		**1.11**	**(1.00,1.23)**	**0.043**
LTPA (per week)				
Low (≤52 mins)				
Medium (53 mins-4 hours)		**0.93**	**(0.88,0.98)**	**0.004**
High (5+ hours)		**0.89**	**(0.84,0.94)**	**<0.0005**

Leasure time physical activity

Note: All analyses controlled for age, education level, marital status, employment status, smoking status, the number of dependent children, country of birth and clustering by neighbourhood. Bolded associations were significant. b Standardised regression coefficient. c Unstandardised regression coefficient with 95% confidence interval

Mouchacca, J., Abbott, G.R. & Ball, K. Associations between psychological stress, eating, physical activity, sedentary behaviours and body weight among women: a longitudinal study. *BMC Public Health* **13,** 828 (2013). https://doi.org/10.1186/1471-2458-13-828

A. Psychosocial factors and health behaviours

Table 2 Prevalences, age adjusted and multivariate odds ratios (OR), and 95% confidence intervals (CI) of low leisure time physical activity in relation to psychosocial variables. The Scania health survey 2000

	Number (total)	Model 1 OR*	95% CI	Model 2 OR†	95% CI
Men					
Mean (SE) age	41.99 (0.19)				
Total	3877				
Work related stress					
Wish to change profession	912	1.4	(1.2 to 1.8)	1.4	(1.1 to 1.7)
Overtime:					
Often	970	1.3	(1.1 to 1.7)	1.3	(1.1 to 1.6)
Lack of influence on overtime work	835	1.3	(1.01 to 1.6)	1.3	(1.0 to 1.7)
Job strain categories:					
Relaxed	542	1.0	–‡	1.0	–‡
Active	797	1.0	(0.7 to 1.3)	1.3	(0.9 to 1.9)
Passive	657	1.3	(1.0 to 1.7)	1.7	(1.2 to 2.4)
Job strain	521	1.5	(1.1 to 2.0)	1.4	(1.0 to 2.0)
Non-work related stress					
High daily stress level	778	1.8	(1.5 to 2.2)	2.0	(1.6 to 2.4)
Economic distress	257	2.3	(1.7 to 3.0)	2.2	(1.6 to 3.1)
Low social participation	880	2.7	(2.2 to 3.2)	2.3	(1.9 to 2.9)
Low social trust	1486	1.8	(1.5 to 2.1)	1.7	(1.4 to 2.1)
Low social anchorage in neighbourhood	1028	1.4	(1.2 to 1.7)	1.3	(1.1 to 1.6)
Lack of social support:					
Emotional	1463	1.4	(1.2 to 1.7)	1.3	(1.1 to 1.6)
Instrumental	1049	1.5	(1.3 to 1.8)	1.3	(1.1 to 1.6)
Sedentary behaviour	661				

*Adjustment for age. Adjustment for age, socioeconomic status, marital cohabiting status, ethnicity, and physically active work. `Reference category

Wemme KM, Rosvall M Work related and non-work related stress in relation to low leisure time physical activity in a Swedish population *Journal of Epidemiology & Community Health* 2005;**59**:377-379.

B. Psychosocial factors and CVD

- The most widely studies health outcome regarding the effect of psychosocial factors.

- Vast evidence for an inverse association with:
  - Negative emotional states (including depression, anger, hostility and anxiety)
  - Chronic and acute stressors (work and non-work related)
  - Poor social support and social conflict

- Traditional risk factors do not explain all the variation in CVD (smoking, poor diet, high blood pressure, high cholesterol, etc.).

Everson Rose et al. PSYCHOSOCIAL FACTORS AND CARDIOVASCULAR DISEASES, **Annual Review of Public Health** https://doi.org/10.1146/annurev.publhealth.26.021304.144542

B. Psychosocial factors and CVD

Table 3 Adjusted hazard ratios for cardiovascular events according to psychosocial factors stratified by gender

	Composite primary cardiovascular event		Myocardial infarction		Stroke		Cardiovascular death	
	Adjusted HR (95% CI)[†‡]	p-value	Adjusted HR (95% CI)[†‡]	p-value	Adjusted HR (95% CI)[†‡]	p-value	Adjusted HR (95% CI)[†‡]	p-value
Men								
Educational level*								
High education	1.00 (ref)		1.00 (ref)		1.00 (ref)		1.00 (ref)	
Low education	1.25 (0.87–1.80)	0.223	1.34 (0.76–2.35)	0.308	2.11 (1.09–4.06)	0.026	0.65 (0.36–1.16)	0.148
Social support in the household								
Live with others	1.00 (ref)		1.00 (ref)		1.00 (ref)		1.00 (ref)	
Live alone	0.74 (0.30–1.61)	0.512	0.74 (0.18–3.05)	0.682	0.33 (0.46–2.39)	0.272	1.53 (0.47–4.98)	0.477
Diagnosis of Depression								
No	1.00 (ref)		1.00 (ref)		1.00 (ref)		1.00 (ref)	
Yes	0.76 (0.40–1.46)	0.414	0.50 (0.16–1.60)	0.241	0.56 (0.17–1.79)	0.327	1.42 (0.56–3.62)	0.460

Mejía-Lancheros, C., Estruch, R., Martínez-González, MA. *et al.* Impact of psychosocial factors on cardiovascular morbimortality: a prospective cohort study. *BMC Cardiovasc Disord* **14,** 135 (2014). https://doi.org/10.1186/1471-2261-14-135

B. Psychosocial factors and CVD

- Prospective Urban Rural Epidemiology study

- Population-Based Cohort From 21 Low-, Middle-, and High-Income Countries

- 118 706 participants (mean [SD] age 50.4 [9.6] years; 69 842 [58.8%] women and 48 864 [41.2%] men) without prior CVD and with complete baseline and follow-up data were included.

Figure. Adjusted Hazard Ratios (HRs) for All-Cause Mortality, Cardiovascular Disease (CVD), Coronary Heart Disease, and Stroke by Composite Score (CS) of Psychosocial Factors

A Stroke

Stress level	HR (95% CI)
CS-3	1.30 (1.09-1.56)
CS-2	1.07 (0.94-1.21)
CS-1	1.05 (0.96-1.15)

B Coronary heart disease

Stress level	HR (95% CI)
CS-3	1.24 (1.08-1.42)
CS-2	1.15 (1.04-1.26)
CS-1	1.09 (1.01-1.18)

C CVD

Stress level	HR (95% CI)
CS-3	1.22 (1.08-1.37)
CS-2	1.07 (0.98-1.16)
CS-1	1.04 (0.97-1.11)

D All-cause death

Stress level	HR (95% CI)
CS-3	1.17 (1.06-1.29)
CS-2	1.19 (1.11-1.27)
CS-1	1.09 (1.03-1.16)
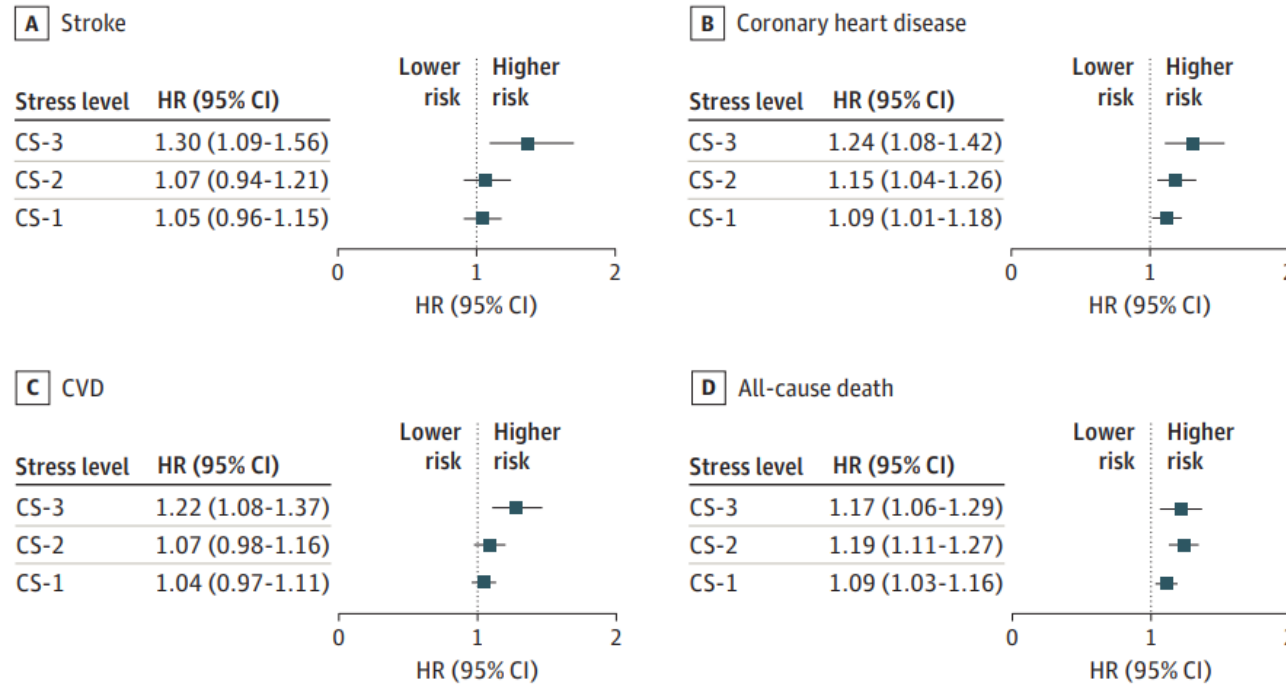
HRs were adjusted for age, sex, education, marital status, location, abdominal obesity, hypertension, smoking, diabetes, family history of CVD, and center random effects. No stress was used as the reference. CS-1 indicates low stress; CS-2, moderate stress; CS-3, high stress.

December 15, 2021   6/11

Santosa A, Rosengren A, Ramasundarahettige C, et al. Psychosocial Risk Factors and Cardiovascular Disease and Death in a Population-Based Cohort From 21 Low-, Middle-, and High-Income Countries. JAMA Netw Open. 2021;4(12):e2138920. doi:10.1001/jamanetworkopen.2021.38920

C. Psychosocial factors and diabetes mellitus

No.	First author (year) [Ref]	Adverse psychosocial factors category	Sample size	r (95% CI)
3	Cohen et al (2004) [29]	(3) Poor social support	116	0.095 (−0.089–0.273)
4	Taylor et al (2003) [30]	(2) Personality or coping style	84	−0.251 (−0.442––0.039)
5	Johnston-Brooks et al (2002) [31]	(2) Personality or coping style	60	0.135 (−0.123–0.376)
7	Goldston et al (1995) [33]	(1) Stressful events	88	0.164 (−0.047–0.361)
8a	Jacobson et al (1994) [34] male	(3) Poor social support	31	0.278 (−0.085–0.576)
8b	Jacobson et al (1994) [34] female	(3) Poor social support	30	0.000 (−0.360–0.360)
9a	Spiess et al (1994) [35]	(1) Stressful events	43	−0.060 (−0.354–0.245)
9b	Spiess et al (1994) [35]	(2) Personality or coping style	43	0.359 (0.066–0.595)
9c	Spiess et al (1994) [35]	(3) Poor social support	43	0.315 (0.016–0.562)
10	Aikens et al (1992) [36]	(1) Stressful events	61	0.130 (−0.126–0.370)
11	Gustafsson et al (1987) [37]	(3) Poor social support	17	0.203 (−0.308–0.623)
	Subtotal (type 1 diabetes)		616	0.110 (−0.005–0.231)
1	Frey et al (2007) [27]	(3) Poor social support	71	0.291 (0.062–0.491)
2a	Nakahara et al (2006) [28]	(1) Stressful events	250	0.052 (−0.073–0.175)
2b	Nakahara et al (2006) [28]	(2) Personality or coping style	250	0.052 (−0.073–0.175)
2c	Nakahara et al (2006) [28]	(3) Poor social support	250	0.104 (−0.020–0.225)
6	Lane et al (2000) [32]	(2) Personality or coping style	67	0.000 (−0.240–0.240)
	Subtotal (type 2 diabetes)		888	0.083 (0.014–0.151)
	No.1–11 overall total		1,504	0.096 (0.028–0.163)

Fig. 2 Forest plots of individual studies investigating the association between adverse psychological factors and diabetes mellitus. Individual study symbols are proportional in size to the weight of the study. Only those studies for which effect sizes could be computed have been included

Critical perspectives on the impact of psychosocial factors on health

Do we have enough evidence to support public health interventions?

- Is the association casual?
  - Reverse causation?
  - Reporting bias?
  - Confounding by aspects of the material environment that are usually linked to "misery"

- How accurate are measures of psychosocial factors?

- Do material factors offer a better explanation?

- In a world where we have limited resources, how should we allocate them to improve health?
  - Prioritise the psychosocial environment?
  - Prioritise the material environment? (household conditions, income, etc.)