Data supplement to Baxter et al. Reducing excess mortality due to chronic disease in people with severe mental illness: meta-review of health interventions. Br J Psychiatry doi: 10.1192/bjp.bp.115.163170

Search method

For this review we searched four relevant electronic databases: the Cochrane database of systematic reviews; the Database of abstracts of reviews of effects (DARE); Campbell database of systematic reviews; and Database of promoting health effectiveness reviews (DoPHER). Both qualitative meta-analyses and narrative reviews of the literature were accepted providing they reported effect sizes of included studies and the characteristics of the intervention group the versus control group.

Information sources:

Cochrane database of systematic reviews (Cochrane reviews) (1996- ; updated quarterly):

A source of up-to-date information on the effects of interventions in health care, designed to provide information and evidence to support decisions taken in health care and to inform those receiving care.

Database of abstracts of reviews of effects (DARE) through the University of York Centre for Reviews and Dissemination (CRD) Assessed reviews (www.york.ac.uk/inst/crd) (1994- ; updated monthly):

Reviews of research evidence which locate, appraise and synthesise evidence from scientific studies in order to provide informative empirical answers to scientific research questions. The reviews are identified by regular searching of bibliographic databases, hand searching of key major medical journals, and by scanning grey literature. These searches are conducted by the information staff of the NHS Centre for Reviews and Dissemination. The following databases are currently searched: Current Contents Clinical Medicine (weekly), MEDLINE (monthly), CINAHL (monthly), ERIC (annually), Biosis (annually), Allied and Alternative Medicine (annually), PsycINFO (annually)

Campbell database of systematic reviews(http://www.campbellcollaboration.org/)

Database of promoting health effectiveness reviews (DoPHER):

(http://eppi.ioe.ac.uk/webdatabases/Intro.aspx?ID=2). Provides focussed coverage of systematic and non-systematic reviews of effectiveness in health promotion and public health worldwide.

CINAHL (including MEDLINE) (1982-):

Search strings:

Cochrane Library: (mental disorder*:kw or "schizophrenia":kw or bipolar*:kw or depress*:kw) AND (survival*:ti,ab,kw or mortality*:ti,ab,kw or death rate*:ti,ab,kw) AND (*therapy:kw or "intervention studies":kw or *health care*:kw), in Cochrane Reviews (Reviews only) (Word variations have been searched)

DoPHER: (Freetext: ‘mental disorder’ or schizophrenia or depression or bipolar) AND (Freetext: mortality or survival or deaths) AND (Type of study: meta-analysis or review or systematic review)

CINAHL (including Medline): (MW mental disorders OR MW schizophrenia OR MW schizoaffective disorders OR MW bipolar disorder OR MW depression) AND (MW interventions OR MW treatment OR MW case management OR MW therapies OR MW therapy OR MW health care) AND (AB mortality OR AB death* OR AB survival). Limiters - Exclude Pre-CINAHL; Human; Publication Type: Meta Analysis, Meta Synthesis, Review, Systematic Review. Search modes - Boolean/Phrase

Table DS1 Summary of review papers reporting the effect of interventions on physical health in people with severe mental illness

	Study group	Intervention(s)	Outcomes*	Review type	# studies	Study types	Findings relevant to physical health outcomes	AMSTAR score (out of 11)
Mental health interventions								
Jones *et al* (2012) (22)	People with current diagnosis of schizophrenia	CBT	Adverse effect/events including mortality, relapses and hospitalisation	Systematic review & meta-analysis	20	RCTs	Death (2 RCTs) RR=0.57 (95%CI 0.12-2.60)	10
Von Ruden *et al* (2008) (21)	People prescribed or taking anti-depressants *(not necessarily with SMI)*	Antidepressants	Cardiovascular events (including mortality)	Systematic review	13	Controlled clinical trials, cohort or case-control studies	Study heterogeneity prevented pooling of summary measures. Includes at least 2 studies where patients had pre-existing CVD (ie depression was subsequent to cardiac disease), 6-7 where no diagnosis SMI was required	3
Weinmann, Read & Aderhold (2009) (20)	Adults with schizophrenia, schizoaffective disorder or other severe mental illness such as bipolar disorder prescribed antipsychotics	Antipsychotic medications	All cause and cause-specific mortality	Systematic review	12	Controlled clinical trials, cohort or case-control studies	Study heterogeneity prevented pooling of summary measures. Antipsychotic dosage and mortality: 3 out of 5 reported a dose effect. Antipsychotic polypharmacy and mortality: 2 out of 4 found an increased risk. No evidence was found for increased	8

							mortality in relation to 1st versus 2nd generation antipsychotics.	
Integrative community care								
Dieterich *et al* (2010) (30)	Adults with SMI (defined as schizophrenia, schizophrenia-like disorders, bipolar disorders, bipolar disorder, depression with psychotic features or/and personality disorder; and not acutely ill)	Intensive case management described as a package of care based on: a) the Assertive Community treatment model; b) Assertive outreach model (i.e. multidisciplinary team-based approach); or c) Case management model; with a caseload up to and including 20 people.	Mortality	Systematic review & meta-analysis	38	RCTs	With standard care as the comparator: Any death (9 RCTs) RR=0.84 (95%CI 0.48-1.47); Death by suicide (9 RCTs) RR=0.68 (95%CI 0.31 -1.51)	8
Malone *et al* (2007) (29)	People presenting to, or being referred to, adult psychiatric services with SMI	Community mental health team (CMHT) treatment, defined as management of care from a multi-disciplinary, community-based team	Mortality	Systematic review & meta-analysis	3	RCTs	Any death (3 RCTs) RR=0.47 (95%CI 0.2-1.3); Death by suicide/suspicious circumstances (2 RCTs) RR=0.49 (95%CI 0.1-2.2) ; Death due to physical health (3 RCTs) RR=0.51 (95%CI 0.1-2.0)	10
Interventions for lifestyle factors								

Alvarez-Jimenez (2008) (42)	Patients with schizophrenia taking antipsychotics	Non-pharmacological interventions	Mean change in body weight gain and BMI	Systematic review	10		WMD = -2.56KG (95%CI -3.20 to -1.92kg, $p<0.001$)	10
Cabassa *et al* (2010) (41)	SMI (including but not limited to schizophrenia, bipolar and schizoaffective disorder)	Behavioral techniques to improve dietary habits and increase physical activity	Weight loss, systolic blood pressure, diastolic blood pressure, HbA1C levels, triglycerides and central adiposity levels	Systematic review	23	RCTs, quasi-experimental and single group studies	Amongst single-group studies, mean weight loss of 4.3±5.6 pounds. Amongst the quasi-experimental studies, mean weight loss of 5.9±6 pounds. Among the RCTs mean weight loss of 3.7±2.3	7
Caemmerer, Correll & Maayan (2012) (37)	Patients using antipsychotic medication	Non-pharmacological interventions	Weight loss or maintenance, insulin and glucose levels, blood lipids and systolic blood pressure	Systematic review & meta-analysis	17	RCTs	Non-pharmacological interventions resulted in a significant weight change of -3.12kg (95%CI -4.03 to -2.21; 14 studies) and a significant change of BMI of $-0.94 kg/m^2$ (95%CI -1.45 to -0.43; 16 studies) compared to control. There was significant improvement in insulin levels (3 RCTs) (WMD= -4.93 uIU/mL, $p<0.001$) and fasting glucose levels (6 RCTs) (WMD= -5.79 mg/dL, $p<0.001$).	6
Faulkner *et al* (2007) (43)	Schizophrenia or schizophrenia-like illnesses	Pharmacological and behavioural strategies for reducing weight gain	Weight gain	Systematic review	23	RCTs	No summary measures reported.	8

Galletly & Murray (2009) (38)	SMI (disorders with psychotic symptoms)	Lifestyle interventions targeting weight loss	Weight-loss/obesity management	Systematic review	16	Not reported	Significant (p<0.05) within-subject results were reported in 6 of the 11 weight loss studies	4
Gierisch *et al* (2013) (32)	Adults with SMI (schizophrenia or schizoaffective disorder, bipolar, or major depression with psychotic features)	Pharmacological, patient focused behavioural strategies for health behaviours and peer and family support interventions	All-cause mortality, CVD risk factors (glucose level, lipid level), weight control	Systematic review & meta-analysis	35	RCTs	Mean weight loss associated with behavioural interventions was about -3.1 kg (95%CI -4.2-2.1); with anticonvulsants about -5.1kg (95%CI -9.5-0.7); and metformin about -4.1 (95%CI 6.8 to -1.7). In 2 studies metformin was also associated with small improvements in HbA1c. Six of 15 trials evaluating blood lipid levels found significant improvement with treatment (in each case pharmacological).	10
Hunt *et al* (2013) (33)	People with SMI (for example, schizophrenia, bipolar disorder and psychosis) and concurrent problem of substance misuse.	Psychosocial interventions for substance misuse categorised into a) Integrated models of care, b) individual approaches (CBT; Motivational interviewing; Contingency management) and c) Group approaches (skills	All-cause mortality	Systematic review & meta-analysis	32	RCTs	Long-term integrated care was not associated with change in risk of death at 3 years (2 RCTs) RR=1.18 (95%CI 0.39-3.57). Motivational interviewing + CBT compared to usual treatment showed no benefit for reducing deaths after an average of 12	10

		training).					months (3 RCTs) RR=0.72 (95%CI 0.22-2.41).	
Tosh *et al* (2014) (31)	Adults with SMI (defined as schizophrenia, schizophrenia-like disorders, bipolar disorder, or serious affective disorders)	General health advice (defined as preventative information or counsel where it is left to the recipient to make the final decision)	Health measures (metabolic criteria and syndrome, heart score and physical work capacity) and adverse events (eg. weight gain, cardiac event, mortality)	Systematic review & meta-analysis	7	RCTs	Death (2 RCTs) RR=0.98 (95%CI 0.27-3.56); Presence of metabolic syndrome (1 RCT) RR=1.25 (95%CI 0.35-4.49)	11
van Hessalt *et al* (2013) (40)	Adults with SMI (included were schizophrenia and psychosis, PTSD or mood disorders, and DSM-IV diagnosis, anxiety disorder or a combination of these)	Behavioural therapies including CBT, structured educational and skill-development programs, peer-led support groups, and improved access to facilities.	Weight, CVD risk factors (cholesterol, Framingham risk score), exercise, smoking, general health scores, diet	Systematic review	22	RCTs	No summary measures reported.	3
Verhaeghe *et al* (2011) (39)	SMI (not defined)	Lifestyle interventions targeting physical activity and eating habits	BMI; change in body weight; general health	Systematic review	14	Not reported	Weighted average weight change based on sample size in the intervention groups was -1.96 ± 1.84 kg (-1.74%) versus +1.77 ± 2.12 kg (+2.28%) in the control groups. Weighted average BMI change based on sample size in the intervention groups was -0.87 ±	7

							0.69 kg/m2 versus +0.64 ± 0.96 kg/m2 in the control groups.	
Screening and monitoring of health parameters								
Tosh *et al* (2014) (16)	SMI (schizophrenia, schizophrenia-like disorders, bipolar disorder or serious affective disorders)	Physical health care monitoring	Physical health, adverse effects of treatment	Systematic review	0	RCTs	No summary measures reported.	4

*Only physiological outcomes are reported here. Reviews may have captured and summarised other outcomes (eg quality of life, psychiatric symptoms, health services use) in addition to those pertinent to this meta-review.

SMI: severe mental illness; CVD: cardiovascular disease; CBT: cognitive behavioural therapy; RCTs: randomised controlled trials; SSRIs: selective serotonin reuptake inhibitors; BMI: Body mass index.

Table DS2 AMSTAR measurement tool to assess the methodological quality of systematic reviews

	1. Was an 'a priori' design provided?	2. Was there duplicate study selection and data extraction?	3. Was a comprehensive literature search performed?	4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	5. Was a list of studies (included and excluded) provided?	6. Were the characteristics of the included studies provided?	7. Was the scientific quality of the included studies assessed and documented?	8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	9. Were the methods used to combine the findings of studies appropriate?	10. Was the likelihood of publication bias assessed?	11. Was the conflict of interest included?	**Total Score (Out of 11)**
Mental health interventions												
Jones *et al* (2012) [22]	✓	?	✓	✓	✓	✓	✓	✓	✓	✓	✓	**10**
Von Ruden *et al* (2008) [19]	✓	✗	✗	✗	✗*	✓	✗	✗	✗	✗	✓	**3**
Weinmann, Read & Aderhold (2009) [18]	✓	✓	✓	✗	✗*	✓	✓	✓	✓	✗	✓	**8**
Collaborative care interventions												
Dieterich *et al* (2010) [30]	✓	✗	✓	✗	✗*	✓	✓	✓	✓	✓	✓	**8**
Malone *et al* (2007) [29]	✓	✓	✓	✓	✓	✓	✓	✓	✓	?	✓	**10**
Intervention for lifestyle factors												
Alvarez- Jimenez (2008) [39]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	**10**
Cabassa *et al* (2010) [38]	✓	✓	✓	✓	✗*	✓	✓	✓	✗	✗	✗	**7**
Caemmerer, Correll & Maayan (2012) [34]	✓	✗	✓	✗	✗*	✓	✗	✗	✓	✓	✓	**6**
Faulkner *et al* (2007) [40]	✓	✗	✓	✓	✗*	✓	✓	✓	✓	?	✓	**8**
Galletly & Murray (2009) [35]	✓	✗	✓	✗	✗*	✓•	✗	✗	✗	✗	✓	**4**
Gierisch et al (2013) [32]	✓	✓	✓	✓	✗*	✓	✓	✓	✓	✓	✓	**10**
Hunt *et al* (2013) [33]	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	**10**
Tosh et al (2014)[2] [31]	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	**11**
van Hessalt *et al* (2013) [37]	✓	✓	✗	✗	✗*	✓	✗	✗	✗	✗	✗	**3**
Verhaeghe *et al* (2011) [36]	✓	✗	✓	✗	✓	✓	✓	✓	✗	✗	✓	**7**
Screening and monitoring of health parameters												

KEY

✓ Yes

✗ No

NA Not Applicable

? Can't Answer

Tosh *et al* (2014)[1] [16]	✓	**NA**	✓	**?**	✓	**NA**	**NA**	**NA**	**NA**	**NA**	✓	**4**

Item 5: ✗* Reviews provided references for the included studies, but not for the excluded studies.

Item 6: ✓• Study characteristics are reported throughout the text sporadically and therefore difficult to extrapolate