Multiple versus single risk behaviour interventions for people with severe mental illness: a network meta-analysis and qualitative synthesis

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Declared competing interests of authors: Rachel Churchill is a current member of the systematic reviews programme advisory group. Simon Gilbody is a member of the following National Institute for Health Research (NIHR) committees: Health Technology Assessment (HTA) Postfunding Committee teleconference (2017–20), Funding Committee Policy Group (2017–20) and HTA Commissioning Committee (2016–20). David Shiers reports personal fees as a clinical advisor to the National Clinical Audit of Psychosis (NCAP), and personal fees from the Wiley-Blackwell publication *Promoting Recovery in Early Psychosis: A Practice Manual* (2010, ISBN 978-1-4051-4894-8), as a joint editor in receipt of royalties, outside the submitted work. He is also an expert advisor to the National Institute for Health and Care Excellence (NICE)'s centre for guidelines and a member of the current NICE guideline development group for rehabilitation in adults with complex psychosis, a board member of the National Collaborating Centre for Mental Health (NCCMH), and a clinical advisor (paid consultancy basis) to NCAP. Elena Ratschen reports grants from the NIHR Programme Grants for Applied Research programme (NIHR200607) and grants from Cancer Research UK, outside the submitted work; she is also a co-opted topic expert on smoking and mental health on a NICE committee developing the new NICE tobacco guideline suite. Sofia Dias reports grants from NIHR during the conduct of the study (NIHR131946). Christopher J Armitage is supported by the NIHR Manchester

Biomedical Research Centre and by the NIHR Greater Manchester Patient Safety Translational Research Centre. Peter Coventry is a member of the following committees: HTA General Board (2018–19) and Health and Social Care Delivery Research Funding Committee (2019–present).

Published March 2022
DOI: 10.3310/NFIZ5916

Scientific summary

Behaviour interventions for severe mental illness

Health and Social Care Delivery Research 2022; Vol. 10: No. 6
DOI: 10.3310/NFIZ5916

NIHR Journals Library www.journalslibrary.nihr.ac.uk

Scientific summary

Background

People with severe mental illness die 15–20 years earlier than the general population and are two to three times more likely to experience long-term conditions. Health risk behaviours (e.g. smoking, physical inactivity) are associated with increased risk for developing long-term conditions (such as cancer, cardiovascular diseases).

People with severe mental illness engage in multiple risk behaviours more frequently than the general population; for example, smoking prevalence is three times higher than in the general population. Unhealthy diet and physical inactivity are also more likely. Reducing these health inequalities, the so-called 'mortality gap' between people with severe mental illness and the general population, is a key priority for the NHS.

Health risk behaviour interventions are a potentially important way to promote health among people with severe mental illness. But there are important questions relating to the evidence. For example, as most people with severe mental illness engage in more than one health risk behaviour, should we target the reduction of multiple risk behaviours in parallel (e.g. target two or more behaviours simultaneously), or target one behaviour at a time?

Therefore, the aim of this review was to examine the clinical effectiveness of multiple risk behaviour interventions, compared with single risk behaviour interventions. We also aimed to identify 'active ingredients' of these interventions, and to identify factors affecting the clinical effectiveness of risk behaviour interventions among people with severe mental illness using data from qualitative studies.

Objectives

The objectives were to:

- evaluate the clinical effectiveness of multiple risk behaviour interventions for behaviour change (e.g. smoking abstinence) targeted by the intervention, and for change in outcomes affected by these behaviours (e.g. weight loss)
- compare the clinical effectiveness of interventions targeting multiple and single risk behaviours on behaviour change and outcomes affected by these behaviours
- examine factors affecting outcomes, including intervention content and participant characteristics
- assess what factors affect experiences of health risk behaviour interventions (e.g. barriers and facilitators) among people with severe mental illness.

Methods

Data sources

We searched the Cochrane Central Register of Controlled Trials (CENTRAL), EMBASE™ (Elsevier, Amsterdam, the Netherlands), MEDLINE, PsycInfo® (American Psychological Association, Washington, DC, USA) and Science Citation Index (Clarivate Analytics, Philadelphia, PA, USA) in October 2018, and updated the search in March 2020. We searched Applied Social Sciences Index and Abstracts (ASSIA), and conducted an updated Cochrane Central Register of Controlled Trials search, in September 2020.

Inclusion criteria

- Population: adults (aged ≥ 18 years) with severe mental illness (psychoses, bipolar disorder or psychotic depression).
- Intervention: any behavioural intervention targeting at least one of the following risk behaviours – smoking, unhealthy diet, physical inactivity, excess alcohol consumption or drug use.
- Comparator: treatment as usual, treatment as usual with additional active content (e.g. attentional control).
- Outcomes: behavioural outcomes (e.g. smoking abstinence, diet intake, total physical activity), outcomes affected through behaviours targeted by the intervention (e.g. weight, body mass index), quality of life, and mental health outcomes (e.g. as measured by the Positive and Negative Syndrome Scale).

Data extraction

We categorised behaviour change techniques using the Behaviour Change Technique Taxonomy version 1. A risk-of-bias assessment of included randomised controlled trials was conducted using the Cochrane Risk of Bias tool. For included qualitative studies, quality assessment was conducted using the Critical Appraisal Skills Programme tool for qualitive studies and the Confidence in the Evidence from Reviews of Qualitative research (CERQual) to assess the certainty of findings.

Data synthesis

Data from quantitative studies were analysed using network meta-analyses, which take into account all direct and indirect evidence within a network of interventions. Evidence proceeded in three stages. Model 1 investigated the clinical effectiveness of interventions targeting multiple and single health risk behaviours. Model 2 investigated if there were positive or negative synergies when interventions targeted multiple risk behaviours. Model 3 investigated the impact of behaviour change techniques on the clinical effectiveness of health risk behaviour interventions.

Data from qualitative studies were analysed using thematic synthesis to identify recurring and emergent themes, and were presented in a narrative synthesis. Initial coding was descriptive, remaining close to original reports and began without hierarchical structure. Translation of coding was iterative and analytical themes were developed through refining coding, comparing primary data with developing themes.

We also investigated whether or not overall themes and subthemes from the synthesis of qualitative studies were investigated in quantitative data in a narrative synthesis. When qualitative and quantitative data overlapped, we assessed their relationship according to four categories: silence (no overlap), partial agreement (complementary findings), agreement (coherence between quantitative and qualitative data) and dissonance (conflicting findings from quantitative and qualitative data).

Results

Quantitative data

We identified a growing literature on smoking (eight trials were included in the narrative synthesis of smoking abstinence and seven trials for number of cigarettes smoked). Interventions focusing on smoking alone were more effective than controls in increasing the odds of abstinence, whereas studies targeting smoking in addition to other risk behaviours (e.g. unhealthy diet, physical inactivity and alcohol misuse) did not find evidence of increased abstinence. However, there was a great deal of conceptual heterogeneity, including the intensity of control groups and smoking interventions across trials. Data on reducing the number of cigarettes smoked varied widely between studies. For all other behavioural outcomes, data were limited. Just over half of included studies in the network meta-analysis were rated as having a high overall risk of bias.

The most reported outcomes were weight (30 trials included in the network meta-analysis) and body mass index (36 trials included in the network meta-analysis). Interventions targeting diet alone, physical activity alone or diet and physical activity concurrently all appeared to be effective in promoting weight loss (e.g. any intervention vs. treatment as usual: −2.10 kg, 95% credible interval −3.14 to −1.06 kg) and body mass index reduction (e.g. any intervention vs. treatment as usual: −0.49 kg/m^2, 95% credible interval −0.97 to −0.01 kg/m^2). The magnitude of weight loss and reduction in body mass index did not differ substantially between studies targeting diet or physical activity alone and studies targeting them concurrently. We also did not find evidence of positive synergies in targeting diet and physical activity to promote weight loss or reduction in body mass index.

Improvements in blood pressure and cholesterol outcomes were modest (e.g. systolic blood pressure, any intervention vs. treatment as usual: −1.33 mmHg, 95% credible interval −3.13 to 0.44 mmHg). But, in contrast to the outcomes discussed previously, targeting multiple risk behaviours appeared to result in greater improvements. Targeting diet (e.g. systolic blood pressure: 0.25 mmHg, 95% credible interval −4.65 to 4.98 mmHg) or physical activity alone (e.g. systolic blood pressure: −0.43 mmHg, 95% credible interval −5.58 to 4.76 mmHg) led to modest improvements, whereas effect estimates were higher in trials targeting diet and physical activity (e.g. systolic blood pressure: −1.64 mmHg, 95% credible interval −4.50 to 0.99 mmHg), and also in trials targeting diet, physical activity, alcohol use and smoking (e.g. systolic blood pressure: −2.26 mmHg, 95% credible interval −5.28 to 0.59 mmHg). This potentially reflects synergies in targeting multiple health behaviours in reducing systolic and diastolic blood pressure.

Fewer data were reported on quality of life and mental health outcomes. We found no evidence that interventions aiming to reduce physical health risk behaviours in people with severe mental illness led to negative impacts on mental health (Positive and Negative Syndrome Scale total score 0.03, 95% credible interval −2.56 to 2.65) or mental health-related quality of life (standardised mean difference −0.06, 95% credible interval −0.31 to 0.19). However, there was also no evidence that interventions promoted physical health-related quality of life (standardised mean difference −0.08, 95% credible interval −0.35 to 0.28).

There was limited overlap between behaviour change techniques in included studies; this reduced our ability to assess the impact on clinical effectiveness and how behaviour change techniques interacted with one another. Goal-setting was associated with weight loss (−2.22 kg, 95% credible interval −4.54 to −0.44 kg) and a reduction in body mass index (−1.85 kg/m^2, 95% credible interval −2.91 to −0.69 kg/m^2). Instruction on how to perform the behaviour was also associated with weight loss (−2.10 kg, 95% credible interval −3.42 to −0.45 kg) and a reduction in body mass index (−1.19 kg/m^2, 95% credible interval −1.85 to −0.55 kg/m^2). Self-monitoring of behaviour was associated with a reduction in body mass index (−0.70 kg/m^2, 95% credible interval −1.42 to 0.07 kg/m^2), although it was not possible to rule out no benefit.

Interventions focusing on delivery to individuals were more effective than group-delivered interventions on weight loss (−2.70 kg, 95% credible interval −4.69 to −0.75 kg) and reduction in body mass index (−1.11 kg/m^2, 95% credible interval −2.15 to −0.01 kg/m^2).

Qualitative data

Data were organised around four higher-tier themes: interaction of physical and mental health, motivational contexts for change, barriers to behaviour change, and experiences of interventions. All themes were rated to be of moderate certainty according to their Confidence in the Evidence from Reviews of Qualitative research (CERQual) evidence profiles.

Interaction of mental and physical health

Engaging in health behaviours was reported to improve mental health and well-being, with mental health changes affecting the ability to engage in healthy behaviours. Individuals wanted to be treated

holistically as a person, but interventions tended to have an impersonal focus on behaviours. There were also data reporting on 'self-medicating' through smoking, alcohol use and drug use to manage mental health symptoms.

Motivational contexts for behaviour change

Holding on to a personal motivation was important, and reports varied from managing health and improving physical appearance, to working towards a positive future. Family and friends were an important source of social support and motivation, providing feedback and reinforcement of positive change. Interventions were interpreted as a safe and stable environment to create change from, offering accountability, which helped in making changes.

Barriers to behaviour change

Mental health symptoms affected the ability to engage with healthy behaviours, such as low mood and lack of motivation, challenging the ability to engage in physical activity. Social support from family and friends could also act as barriers, for instance encouraging engagement in alcohol use or unhealthy eating. A lack of social support was also a barrier to persevering with behaviour change. Environmental factors could act as triggers for unhealthy behaviours, such as living in group homes where peers shared their experiences of engaging in risk behaviours.

Experiences of behaviour change interventions

Tailoring interventions for people with severe mental illness was a prominent concern; it was suggested that tailoring could take the form of additional help in providing structure and organisation in the daily lives of participants. Interventions providing education and skills to promote healthy behaviours were also considered beneficial. Group interventions were helpful for building peer support and meeting others, and also as a point of comparison with others, which could be double-edged if used to police behaviour. Interventions that could adapt behaviour change according to needs, abilities and preferences were positively received. A wealth of data reported the impact of interventions reaching beyond health behaviours and into leading meaningful, active lives, which was highly valued in reports. Interventions also built confidence in the ability to make further positive changes beyond the intervention and in other aspects of life.

Integration of quantitative and qualitative data

The integrative synthesis generally showed limited overlap between quantitative and qualitative studies. Many of the themes in qualitative studies, such as importance of interventions benefiting the person holistically, rather than specific health-related outcomes, were not directly addressed in quantitative studies. The lack of overlap between the quantitative and qualitative evidence may suggest the importance of people with severe mental illness contributing to the design and delivery of interventions. Such interventions may go some way to addressing the needs and preferences of people with severe mental illness, especially in relation to addressing both physical and mental health together. People with severe mental illness also valued interventions that took into account the challenges of their mental health condition. However, the quantitative data rarely reported on this.

Quantitative and qualitative studies agreed on the importance of gaining knowledge and skills to live healthier lives. This theme from the qualitative literature was backed up by the component network meta-analyses that found that the behaviour change technique instruction to perform behaviour was associated with weight loss and reduction in body mass index.

Limitations

Most quantitative studies focused on weight and body mass index; few studies assessed behavioural outcomes. There was also a lack of overlap between quantitative and qualitative studies.

Conclusions

Implications for health care

We found preliminary evidence that focusing on smoking alone may be more effective than targeting smoking along with other health risk behaviours, although heterogeneity in how studies were designed means confounding cannot be ruled out.

The systematic review found no evidence that interventions promoting health behaviours were associated with deterioration in mental health symptoms or mental health-related quality of life. Group discussions and polls from our webinar suggested that this was a key finding. This was rated as the key implication for practice and was a common theme in discussions.

Another key implication from the systematic review was the need for communication between staff and people with severe mental illness on the goals of health risk behaviour interventions. Qualitative data found that people with severe mental illness favoured holistic approaches to well-being that integrated the promotion of physical and mental health, whereas the quantitative data, mainly led by researchers and health-care professionals, consisted of trials focused on weight loss and smoking cessation. This may reflect important differences in the aims of such interventions between people with severe mental illness and professionals delivering interventions. In addition, this may reflect a distinction between how services are currently configured (i.e. physical and mental health care often treated separately) and how people with severe mental illness would like to receive their health care (i.e. integration of physical and mental health care).

Future work

The lack of overlap in findings between the quantitative and qualitative studies is an important gap. Therefore, more mixed-methods approaches are needed that include substantial input from people with severe mental illness in the design and evaluation of interventions.

Identifying how best to adapt interventions for the needs of people with severe mental illness was the key research recommendation identified in our webinar poll, and a common theme in group discussions. Although qualitative data showed that people with severe mental illness valued the availability of choice and the potential adaptation of interventions, the trial data rarely investigated how best to tailor interventions (particularly in trials aiming to promote weight loss). A recent trial has shown the benefits of adapting smoking cessation interventions for people with severe mental illness.

A qualitative investigation of adapting and tailoring interventions to people with severe mental illness would address a gap in the literature and inform any quantitative analyses. Benefits and consequences of interventions reach beyond the quantifiable, so a qualitative study could capture these effects.

We also found few studies with follow-up data of ≥ 12 months post intervention, although current data suggest that, at ≤ 6 months' follow-up, body mass index and weight loss are maintained. These findings need to be confirmed in future research assessing the long-term benefits of health risk behaviour interventions, as well as potential barriers, such as the impact of episodic depression and anxiety or periods spent as an inpatient in a psychiatric facility.

We found few trials that directly compared interventions targeting multiple health risk behaviours with interventions targeting single health risk behaviours. Targeting smoking alone may be more effective than targeting smoking in combination with other behaviours. Future research is needed to clarify which combinations of behaviours to target for interventions.

Study registration

This study is registered as PROSPERO CRD42018104724.

Funding

This project was funded by the National Institute for Health Research (NIHR) Health and Social Care Delivery Research programme and will be published in full in *Health and Social Care Delivery Research*; Vol. 10, No. 6. See the NIHR Journals Library website for further project information.

Health and Social Care Delivery Research

ISSN 2755-0060 (Print)

ISSN 2755-0079 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: journals.library@nihr.ac.uk

This journal was previously published as *Health Services and Delivery Research* (Volumes 1–9); ISSN 2050-4349 (print), ISSN 2050-4357 (online)

The full HSDR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hsdr. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

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The research reported in this issue of the journal was funded by the HSDR programme or one of its preceding programmes as project number 17/05/88. The contractual start date was in September 2018. The final report began editorial review in July 2020 and was accepted for publication in January 2021. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HSDR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

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