

Review Article

Benefits to Mental Wellbeing from Making Positive Changes in Health-Related Behaviours: An Ultra-Rapid Review

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Background and aims. Changes in health-related behaviours that have a longer-term impact on physical health have also been found in many studies to lead to relatively rapid improvements in mental wellbeing. This ultra-rapid review aimed to draw together evidence from reviews and relevant individual studies to characterise this phenomenon in a way that could inform messaging aimed at motivating people to make positive changes in these behaviours. It focused on reducing alcohol consumption from high-risk levels, stopping cigarette smoking, eating a healthier diet, and moving from low to at least moderate levels of physical activity.

Methods. An ‘ultra-rapid review’ methodology was developed to summarise a body of literature in which there already exist reviews and individual studies pointing to a broadly consistent conclusion. The methodology involved 1) a manual search using Google Scholar and PubMed using a prespecified search expression, accompanied by 2) a structured research question as a prompt to a research-specific generative AI tool (elicit.com), then 3) manually synthesising the findings and identifying areas of inconsistency and nuance.

Results and conclusions. Reducing alcohol consumption from high-risk levels, stopping cigarette smoking, moving from an unhealthy to a healthy diet, and from a low to at least moderate level of physical activity have been found to result in relatively rapid overall increases in mental wellbeing that persist over time. Improvements can be detected as early as a few weeks after making the changes. The conclusions derive from experimental as well as observational studies, increasing confidence in the associations being causal.

Introduction

Longer-term health benefits have been established of reducing alcohol consumption from high-risk levels, stopping tobacco smoking, improving diet, and increasing physical activity from low to at least moderate levels.^{e.g.,[1]} There is also evidence that these changes in behaviour patterns can lead to relatively rapid improvements in mental wellbeing.^{e.g.,[2]} Summarising this evidence could provide a potentially useful resource to support public health campaigns aimed at motivating people to make positive changes to health behaviours and use support that is available.

An ‘ultra-rapid review’ approach^[3] can be appropriate where one is not seeking to discover specific effects or estimate effect sizes, but summarise broad conclusions on a topic in which high-quality reviews have already been conducted, and where the research questions are framed in ways that are intended to be meaningful to policy-makers, practitioners and the public.

This approach can take advantage of AI tools that have become available recently. However, these tools are still in early stages of testing, and they have limitations in relation to potentially ‘hallucinating’ studies and findings, misrepresenting study findings, failing to identify important studies and reviews, conflating primary studies and existing systematic reviews, and overweighting studies or reviews of low quality.^[4] There is an important programme of work evaluating the use of AI tools for evidence synthesis and providing guidance on responsible use.^[5] A methodology was developed to combine a manual review process and selective use of an AI tool specialised for undertaking scientific literature reviews.

A significant advantage of AI tools for this type of research question is that they can use broad semantic interpretations of terms to identify relevant documents. For example, what exactly constitutes a ‘healthy diet’ is operationalised in different ways in different studies, as is high-risk alcohol consumption and an appropriate level of physical activity.

Aims and research questions

The overall aim was to summarise evidence on the relatively rapid effects on mental wellbeing of making positive changes in four health-related behaviours: alcohol consumption, tobacco smoking, diet and physical activity.

The specific form of the research questions was:

Does [change in health-related behaviour pattern] have a short-term positive effect on mental wellbeing and life satisfaction in adults?

The change in health-related behaviour pattern was specified as:

1. Stopping cigarette smoking,
2. Reducing excessive alcohol consumption,
3. Improving diet, and
4. Increasing level of physical activity.

The changes in behaviour pattern were framed in terms that were intended to be meaningful to key stakeholders and allow for studies to be included that may operationalise them in different ways. For example, with regard to alcohol consumption the question did not specify how much the target population is reducing alcohol consumption, from what level or whether they are moving to abstinence. Similarly, with regard to diet, the question allowed for many different ways in which people may improve their diet; and with physical activity the question did not specify the starting or target levels or the type of exercise. This allowed for a broader search but also the need to consider caveats that may arise in the evaluation of the findings.

Methods

The review followed an AI-assisted ultra-rapid review methodology that was developed for the purpose.

Pre-registration

The study protocol and analysis plan were pre-registered on Open Science Framework (<https://osf.io/j2gpc>).

Phase 1

For each health behaviour change, a search was made of Google Scholar and PubMed focusing on years 2000 or later using the terms given above for the behaviour together with the expression:

(‘Short-term’) AND (‘mental wellbeing’ OR ‘happiness’ OR ‘life satisfaction’) AND (‘review’)

The most recent reviews were assessed for quality and relevance and their conclusions extracted.

Then articles that cited these reviews were searched to identify any that would update or change the conclusions, including later reviews that were not picked up in the original search and individual studies.

To check whether any important systematic reviews had been missed, the search expression was generalised to the behaviour pattern plus ‘effect’ and ‘systematic review’.

Phase 2

The specialist scientific literature review AI tool, *elicit.com* ‘Pro’ version was selected because it provides a transparent and detailed explanation of its review processes, including documentation of all the studies initially found, the criteria for selection according to relevance, the papers identified in this step, and the information extracted for use in the review. We provide all this information in supplementary materials linked to this paper.

The prompt was: *‘Does [change in health-related behaviour] have a short-term effect on wellbeing or life satisfaction in adults?’*

Elicit.com allows for different levels of thoroughness of search and data extraction. For this ultra-rapid review, it was set to search up to 1.7 million papers, screen up to 500 papers, and extract detailed information from the 25 most relevant papers based on criteria developed by *elicit.com* from the research question.

Unplanned analyses

To gain a clearer understanding of how quickly improvements in mental wellbeing could be observed, we prompted *elicit.com* with the following questions: *‘What is the best estimate of how quickly adults who currently [have excessive alcohol consumption/smoke/have a poor diet/have a low level of physical activity] can expect to see an improvement in mental well-being or life satisfaction if they [reduce their alcohol consumption/stop smoking/improve their diet/increase their level of physical activity]?’*.

Results

Reducing alcohol consumption

Google Scholar and PubMed

A major review was published in 2016 concluding that interventions that reduce alcohol consumption from hazardous levels improve both physical health and mental quality of life.^[6] Another review was found dating back to 1985 which concluded that moderate alcohol consumption was associated with

higher wellbeing compared with complete abstinence and high levels of alcohol consumption.^[7] Our search of reports of individual clinical trials of treatments for alcohol dependence found improvements in quality of life associated with reduced alcohol consumption^[8] and prospective cohort and cross-sectional studies have found temporal, and between-individual, associations between wellbeing and level of alcohol consumption with low levels of wellbeing in non-drinkers and heavy drinkers and higher levels associated with moderate alcohol consumption^{[9][10][11]}.

Elicit

Elicit concluded that reducing alcohol consumption appears to yield short-term improvements in adult well-being, especially in mental health. Overall mental quality of life was found to improve as well as mood and social relationships. The full Elicit report plus tables of papers identified, criteria used to select papers, papers selected and information extracted are provided in the supplementary materials.

In particular, it was noted in several Dry January challenges, participants who achieved abstinence reported gains on measures such as the Warwick-Edinburgh Mental Wellbeing Scale.^[12] Investigations of naturalistic drinking pattern changes found that reduced consumption was linked to enhanced mental wellbeing and that mood and mental wellbeing tended to be improved after alcohol-free days compared with days when alcohol was consumed. In one study in Hong Kong and the United States, women who stopped drinking completely reported improvements in wellbeing.^[13]

In the unplanned analysis it was reported that improvements in mental wellbeing could be observed within 10 weeks of initiating alcohol reduction. (See supplementary materials.)

Overall

There is consistent evidence that reducing alcohol consumption from high-risk levels tends to lead to an improvement in mental wellbeing, including overall mental quality of life, mood and social relationships, and that this can occur within around 10 weeks of making the change. It is possible that temporary abstinence may improve wellbeing in the short-term, whereas stable non-drinkers had lower wellbeing overall, which could be due to non-drinkers' characteristics that may not be completely accounted for in observational studies (e.g. prior poor health). It is not clear whether moving from drinking alcohol to not drinking confers a benefit relative to low levels of alcohol consumption and neither is it clear what is the threshold level of consumption above which mental wellbeing starts to deteriorate.

Stopping smoking

Google Scholar and PubMed

Several major systematic reviews have concluded that stopping cigarette smoking tends to improve mental health and wellbeing.^{[14][15][16]} In one case the quality of evidence was judged to be low, given that it was based on observational data that may be subject to confounding^[16]. Large scale individual studies have found reductions in anxiety and depression and increases in happiness when people stop smoking.^{[17][18][19][20][21]}

Elicit

The Elicit review concluded that stopping cigarette smoking is linked with measurable improvements in mental wellbeing. Several studies report that, compared with continued smoking, abstinence is associated with lower depression scores and reduced anxiety observed as early as 6 weeks, with benefits persisting for 12 months or longer. Smoking cessation has been found to be linked to gains in psychological and social quality of life. The full Elicit report plus tables of papers identified, criteria used to select papers, papers selected and information extracted are provided in the supplementary materials.

In the unplanned analysis it was confirmed that mental wellbeing typically improved within 6 weeks of stopping smoking. (See supplementary materials.)

Overall

There is consistent evidence from longitudinal and cross-sectional population studies and treatment follow-up studies that smokers who stop smoking experience an improvement in mental wellbeing within 6 weeks. While it remains possible that the improvement in mental wellbeing results from an interaction between stopping smoking and other factors such as smoker characteristics, there is a reasonable expectation that smokers who stop will have a more positive life experience and that this will continue relative to what would have happened if they had continued to smoke.

Healthy diet

Google Scholar and PubMed

There was consistent evidence from reviews of observational and intervention studies that diets that contain more fruit and vegetables relative to fat and sugars are associated with lower levels of anxiety and depression and higher mental quality of life and life satisfaction, and that making improvements in diet along these lines improves mental wellbeing.^{[22][23][24][25][26][27][28][29][30][31][32]} Improvements in diet may involve eating more fruit and vegetables or moving to a 'Mediterranean diet' that also includes plant-based foods like fruits, vegetables, whole grains, legumes, nuts, and olive oil.

Elicit

The elicit.com review concluded that improving diet is associated with measurable gains in life satisfaction and overall wellbeing. Increased fruit and vegetable intake, adherence to Mediterranean and plant-based diets, and improvements in general diet quality have been linked to increases in subjective happiness, higher SF-36 mental scores, and reduced depressive symptoms. In several studies, individuals with low baseline dietary quality experienced benefits within weeks to months after dietary changes. The full Elicit report plus tables of papers identified, criteria used to select papers, papers selected and information extracted are provided in the supplementary materials.

In the unplanned analysis, it was reported that dietary improvement could result in a detectable improvement in mental wellbeing within around 3 weeks. (See supplementary materials.)

Overall

There is consistent evidence that increasing intake of fruit and vegetables relative to fat, red meat and sugar tends to increase mental wellbeing and mental health, an improvement that can occur within around 3 weeks.

Physical activity

Google Scholar and PubMed

There is consistent evidence from reviews of observational and interventional studies that increasing physical activity, particularly from low levels, tends to lead to an improvement in mental health and

positive mental wellbeing.^{[33][34][35][36][37]} Most of the evidence relates to reductions in symptoms of mental ill-health such as anxiety and depression, but there is some evidence of positive improvements in mood.

Elicit

The elicit.com review found that increasing physical activity is linked with measurable gains in life satisfaction and overall wellbeing. In several randomised trials and observational studies, formerly sedentary adults reported higher quality-of-life scores, enhanced mood, and reduced depressive symptoms when they increased their levels of physical activity.

Sustained increases in physical activity appear to be important for maintaining benefits. Some studies noted that when daily activity declined, improvements in subjective wellbeing and mental health diminished, whereas interventions that led to consistent activity yielded quality-of-life gains that persisted from eight months to as long as 15 years. The full Elicit report plus tables of papers identified, criteria used to select papers, papers selected and information extracted are provided in the supplementary materials.

In the unplanned analysis it was reported that adults with low physical activity can expect to see improvements in mental wellbeing within 4 weeks. (See supplementary materials.)

Overall

There is consistent evidence from multiple study designs that increasing physical activity from low levels tends to lead to an improvement in mental wellbeing and this effect can be detected within around 4 weeks. The most robust findings relate to reduction in symptoms of mood disorder but there is evidence of improvements in positive mental quality of life.

Discussion

This ultra-rapid review summarised evidence on the short-term effects of positive health-related behaviour changes—reducing alcohol consumption, stopping smoking, improving diet, and increasing physical activity—on mental wellbeing. The findings indicate that these behavioural changes are associated with relatively rapid improvements in mental wellbeing, with benefits persisting over time. The improvements can be detected within a few weeks of the behaviour change being initiated. The

conclusions are supported by a combination of observational and experimental studies, lending credibility to the causal nature of these associations.

The findings are subject to some caveats. While reducing high-risk alcohol intake is linked to improved wellbeing, the benefit in terms of mental wellbeing of moving from moderate alcohol consumption to abstinence remains unclear. Temporary abstinence (e.g., "Dry January") shows short-term benefits, but long-term outcomes and thresholds for optimal consumption require further investigation. While stopping smoking is associated with reduced anxiety and depression, confounding factors (e.g., smoker characteristics) may influence outcomes and the evidence is primarily observational. With regard to the evidence on dietary change, the diversity in dietary definitions across studies complicates generalisability. With regard to increased activity, sustained activity appears to be necessary for maintaining benefits.

The review had several limitations. It prioritised breadth over depth, potentially overlooking nuanced findings or studies that would require more specific search expressions including all the terms used to describe the behaviours and their influences. Variability in how behaviours (e.g., "healthy diet") were operationalised across studies limits direct comparability. While the AI-assisted reviews (e.g., using [elicit.com](#)) enhanced efficiency, they may have missed relevant studies or overemphasised lower-quality evidence. However, we combined these with manual searches to mitigate this limitation.

These findings suggest a role for public messaging that highlights relatively rapid mental wellbeing benefits as a motivator for health behaviour change. Future research could usefully prioritise experimental designs to clarify causal mechanisms and explore thresholds for optimal behaviour change (e.g., alcohol reduction levels).

Supplementary Material

The supplementary material, available in .zip format, can be downloaded from [here](#).

Notes

Short title: Effects of positive health-related behaviour change on wellbeing

Statements and Declarations

Competing interests

This paper was commissioned by the English Department of Health through Freuds Communications Agency. RW undertakes paid consulting for Public Health Wales' Behavioural Science Unit, Freuds communications agency, Everyone Health, the English College of Policing, Godot Inc, Qnovia and Lilly. He is an unpaid advisor to the UK's National Centre for Smoking Cessation and Training, the Smoke-Free mobile application. He is an unpaid Director of the Unlocking Behaviour Change Community Interest Company. SJ and LNF received payment from the English Department of Health through Freuds Communications Agency to undertake this work.

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Declarations

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