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IMPACT Research Showcase 2023 Digital Abstract Booklet

FOOD AND MOOD

A survey of Australian cardiac rehabilitation practitioners' attitudes and practices regarding psychosocial well-being and healthy eating

Background

Cardiac rehabilitation (CR) significantly reduces the risk of recurrent cardiovascular events and improves quality of life. Psychosocial well-being and healthy eating are essential components of CR and are included in the current National Heart Foundation of Australia's standardised program content. However, little is known regarding practitioners' attitudes and practices towards these components.

Methods

We conducted a national survey to establish attitudes and practices regarding psychosocial well-being and healthy eating. Practitioners were recruited through professional networks. The survey was completed via redcap and asked multiple-choice and rating scale questions about the practitioner and their program (n=6), psychosocial well-being (n=11) and healthy eating (n=6). Descriptive statistics were performed.

Results

The survey was completed by 98 CR practitioners, representing approximately 25% of Australian CR programs.

All participants were familiar with the standardised program content for CR (8% slightly, 36.8% moderately, 36.8% very, and 18.4% extremely familiar). Figure 1 describes practitioners' attitudes and competencies. All but one practitioner screened for psychosocial well-being during CR, 72.5% screen at program commencement, 25.5% screen throughout the program, and 49.0% screen or rescreen at program completion. Healthy eating education was reported by 98.8% of participants. However, only 54.9% offered an individualised consultation with health professionals such as a dietitian.

Conclusion/implications

CR practitioners commonly report that psychosocial well-being and healthy eating play an important role in recovery and preventing subsequent events. However, psychosocial well-being assessment across the course of CR is less common, as is offering individualised dietary counselling with trained health professionals such as a dietitian.

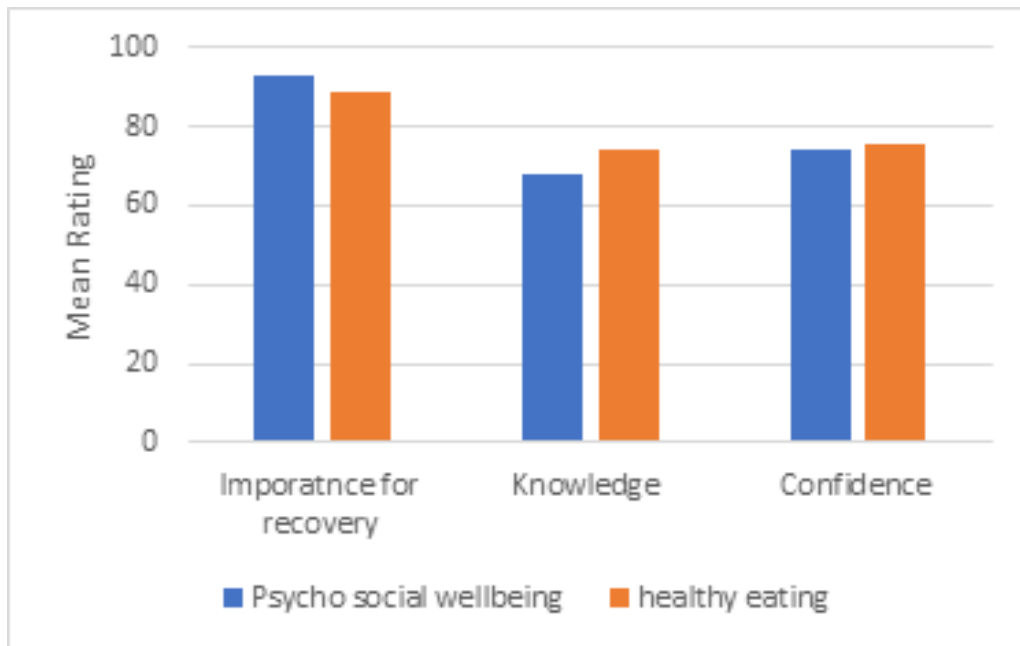


Figure 1. The mean response from rating scales on practitioners' attitudes towards psychosocial well-being and healthy eating in CR

Are lifestyle factors the most important predictors of common mental disorders? A Systematic Review

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Background

Depression and anxiety, known as common mental disorders (CMDs), affect millions worldwide and impose great burden on individuals and communities (1). Recently, machine learning (ML) has been used to interrogate large datasets and develop models that predict CMDs based on lifestyle, demographic, and/or biological risk factors. This review aims to synthesise the existing literature from such studies and assess whether lifestyle factors are consistently reported to be more predictive of CMDs than less-modifiable factors, such as demographics. This knowledge could provide new avenues for prevention through targeted lifestyle interventions and/or future risk prediction tools.

Methods

The systematic review was performed in accordance with the PRISMA statement and registered with PROSPERO. Databases searched included MEDLINE, EMBASE, PsycInfo, IEEE Xplore, and Engineering Village. The search strategy aimed to identify studies that used ML to predict CMDs in adults. Studies were included if they used a method that produces a measure of variable 'importance' (e.g. Shapley Values, Gini importance) and differentiated people with CMDs from controls. Search terms included CMD terms in the title, 'diagnosis or differentiation' terms and ML methods that perform 'variable importance analyses' in the abstract. The search was limited to English language articles. All screening and extraction steps were performed in duplicate using Covidence and Microsoft Excel.

Results

The initial search yielded 2318 results (858 duplicates). 1452 papers that were screened using title and abstract, 1099 studies were found to be irrelevant. Thus, 361 studies were screened for full-text eligibility, with 245 excluded to date (26 TBC). 90 studies are currently eligible for extraction. Preliminary results for extracted papers and risk of bias analyses will be presented. Numbers of papers included can be updated on request.

Conclusion

Studies using ML to predict CMDs show reasonable accuracy on average, but also have a high risk of bias and low applicability to real world use-cases. This indicates greater methodological rigour is required to ensure results can be trusted. Specifically, there is a lack of external validation, small sample sizes, and improper handling of outcome data in many studies.

Reference

[1] Institute of Health Metrics and Evaluation, Global Health Data Exchange (2019), <https://ghdx.healthdata.org/gbd-results-tool?params=gbd-api-2019-permalink/87120109249ceec600942153d36ee021>

Clustering of health behaviours and their associations with common mental disorders: The NESDA study

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Background

Common mental disorders, including depression and anxiety, are a major source of disease burden, and despite considerable efforts to improve treatment access and stigma, prevalence remains high(1). Additional methods to address this burden are urgently needed, including identifying modifiable risk factors. Research repeatedly suggests that lifestyle behaviours (diet, physical activity, sleep, tobacco smoking, and alcohol use) are associated with depression and anxiety risk(2). However, the potential impact of clustering lifestyle behaviours is underexplored. The aim of this study is to identify clusters of lifestyle behaviours and assess how these clusters associate with depression and anxiety presence and/or severity.

Methods

We will use latent profile analysis to identify clusters of lifestyle behaviours in wave 6 of the Netherlands Study of Depression and Anxiety (NESDA). We will then assess the associations between lifestyle behaviour clusters and depression and/or anxiety presence and severity using regression models.

Results

NESDA included 2069 individuals with and without depression and/or anxiety. Participants were aged 26-75 years old (*mean*=50.8) and 66.1% were female. Of these, 27.5% had a current depressive and/or anxiety disorder; 53.4% had a remitted depressive and/or anxiety disorder; and 19.1% had no lifetime history of depressive and/or anxiety disorder. Full results are expected by early October.

Conclusion

This study will assist with identifying individuals who may be at an increased risk of common mental disorders by observing their lifestyle behaviour patterns. Understanding how modifiable lifestyle behaviours cluster together may also provide important insights for developing effective common mental disorder prevention and treatment interventions.

References

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Fibre intake and fibre intervention in depression and anxiety: A systematic review and meta-analysis of observational studies and randomised controlled trials

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Background

Dietary fibres hold potential to influence depressive and anxiety outcomes by modulating the microbiota-gut-brain axis. Evidence for the effects of fibres on depressive and anxiety outcomes remains unclear.

Methods

A systematic literature review and meta-analysis was conducted including observational studies and randomised controlled trials (RCTs). Eligible studies were identified through a systematic search conducted across PubMed, EMBASE, CENTRAL, CINAHL and PsychINFO. Meta-analyses via random effects models were performed to examine the 1) association between fibre intake and depressive and anxiety outcomes in observational studies, 2) effect of fibre intervention on depressive and anxiety outcomes compared with placebo in RCTs.

Results

A total of 181,405 participants were included in 23 observational studies. In cross-sectional studies, an inverse association was observed between fibre intake and depressive (*Cohen's d* effect size (*d*): -0.11; 95% CI: -0.16, -0.05) and anxiety (*d*: -0.25; 95% CI: -0.38, -0.12) outcomes. In longitudinal studies there was an inverse association between fibre intake and depressive outcomes (*d*: -0.07; 95% CI: -0.11, -0.04). In total, 740 participants were included in 10 RCTs, all of which used fibre supplements. No difference was found between fibre supplementation and placebo for depressive (*d*: -0.47; 95% CI: -1.26, 0.31) or anxiety (*d*: -0.30; 95% CI: -0.67, 0.07) outcomes. Although observational data suggest a potential benefit for higher fibre intake for depressive and anxiety outcomes, evidence from current RCTs do not support fibre supplementation for improving depressive or anxiety outcomes. Further research, in clinical populations and using a broad range of fibres is needed.

Key words: dietary fibre, prebiotics, depression, anxiety, gut microbiota

Investigating the bidirectional association between depression and cardiometabolic diseases: a systematic review and meta-analysis of Mendelian Randomisation studies

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Background

Observational studies have demonstrated a bidirectional association between depression and cardiometabolic diseases^{1,2}. However, the temporality of this relationship remains unclear, and there is a risk of reverse causation. Mendelian randomisation can help minimise reverse causality and confounding in observational studies, by using measured genetic variants to examine the potential causal relationship between depression and cardiometabolic diseases³. We aim to investigate whether Mendelian randomisation studies can elucidate this bidirectional relationship.

Methods

The review will be reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. MEDLINE, EMBASE, PsycINFO and CINAHL databases will be used to search for relevant studies, using key words related to

mental health, cardiometabolic diseases and Mendelian randomisation. Study screening and data extraction will be done in duplicate using pre-determined criteria. Risk of bias assessment will be done using the Newcastle-Ottawa Scale (NOS)⁴ and the Q-genie tool⁵. We will conduct a random-effects meta-analysis to determine the association of depression with cardiometabolic disease, including exploring potential sources of heterogeneity ($I^2 > 75\%$) and subgroup analyses, where possible. To assess publication bias Egger's test will be used⁶.

Results

This review will be pre-registered on PROSPERO. Preliminary results will be presented at the IMPACT showcase.

Discussion

This review will help clarify the potential causal relationship between depression and cardiometabolic diseases. Addressing this gap has important implications for health care systems and policy in Australia and beyond and can help identify new prevention strategies for cardiometabolic disease in high-risk populations.

References

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Polyphenols as novel interventions for depression: exploring the efficacy, mechanisms of action, and implications for future research

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Background

Numerous animal and human observational and interventional studies have assessed the relationship between polyphenol intakes and depressive-like behaviours, depressive risk, and depressive symptoms. However, overall, the results from these different study designs, each offering unique insights, are yet to be synthesised.

To improve our understanding of polyphenol consumption as a potential prevention and treatment strategy for depression and to guide future research, the aim of this review was to synthesise the available evidence from animal and human studies.

Methods

A systematic literature search of five electronic databases (Pubmed, EMBASE, The Cochrane Library (Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Methodology Register), CINAHL, PsycINFO) was conducted. Animal studies, observational studies, interventional studies, and systematic reviews and meta-analyses of observational and interventional studies were included.

Results

We included 164 animal studies, as well as 16 observational and 44 interventional human studies assessing the associations of polyphenol intake with depressive-like behaviours, depressive risk, and depressive symptoms, respectively. In animal models, polyphenol exposure largely alleviated depressive-like behaviours. However, the evidence from human studies was less clear, with some studies reporting an inverse relationship of depression risk or depressive symptoms with the intake of certain individual polyphenols (e.g., curcumin), and polyphenol-rich foods (e.g., tea), while others reported no association or effect (e.g., daidzein).

Conclusion

While polyphenol exposure appears to alleviate depressive-like behaviours in animal models, its role as a prevention and treatment strategy for depressive outcomes in humans remains to be determined.

Retrospective Process Evaluation of a Nutrition and Physical Activity Intervention for Adults with Psychological Distress (the CALM trial)

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Background

Lifestyle treatments are shown to be efficacious in reducing depressive symptoms¹, but their effectiveness in real-life health settings is unknown. Our aim is to identify essential characteristics for the implementation of lifestyle programs by using a process evaluation of CALM, a non-inferiority trial that recruited participants with psychological distress and randomised them to a lifestyle or psychotherapy program for 8 weeks.

Methods

The outcomes collected for the evaluation to date all speak to the implementability of the lifestyle intervention, and include participant feedback (overall and sessional), facilitator observations, and fidelity ratings. Non-parametric tests were conducted to identify differences in patient feedback between groups, while thematic analysis was employed to categorize differences between facilitator observations. Parametric tests were used to show any differences in adherence.

Results

Participant feedback was similar between groups, with the main difference being that those receiving psychotherapy found it significantly easier to use the skills they learned in the program. Facilitators of the psychotherapy groups observed more varied engagement, fatigue, and spontaneous discussion than those leading the lifestyle groups, who noted more stable engagement and a higher focus on content and time management. Both groups had participants that supported each other and were more engaged in smaller groups. There were no significant differences in fidelity between the two treatment streams.

Conclusion

To date, the process evaluation of the CALM trial suggests comparable participant satisfaction with lifestyle and psychotherapy programs, with differences in group dynamics and content accessibility that may inform how lifestyle programs can be employed.

Reference

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The Bugs and Bumps RCT study: Investigating the effect of a gut-focused prenatal dietary intervention on infant socio-emotional and neurocognitive outcomes

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Background

We hypothesise that targeting prenatal diet-by-microbiome pathways will be effective in improving prenatal diet quality,¹ and mental health-related outcomes in children.^{2,3} Our new *Bugs & Bumps* smartphone app teaches women to '*eat for their gut bugs*' and is based on our face-to-face intervention that improved prenatal diet quality.¹

Our ECR team has received MRFF funding to conduct an RCT study to test whether *Bugs & Bumps*: 1) improves diet quality, 2) alters gut microbiota and inflammatory markers, and 3) improves socio-emotional and neurocognitive outcomes in children compared to an app

focused on the Australian Dietary Guidelines (ADG). This abstract details our study with the aim of initiating collaborations.

Methods

Our RCT study is powered on diet quality as the primary outcome, and will recruit a total of 120 Geelong-based women from pregnancy clinics. Participation is from gestation week 26 until children are 18 months old. At week 26, after baseline data and stool sample collection, women will be randomised to receive *Bugs & Bumps* or an ADG-focused app throughout pregnancy. Maternal follow-up is at 36 weeks, and involves data and sample collection (blood, urine, stool, and vaginal swab). Infant follow-up occurs at birth, 9, 12 and 18 months where health, diet, and socio-emotional and neurocognitive outcomes and stool samples will be collected.

Results

This presentation will detail the study and highlight opportunities for collaboration and contribution.

Conclusion

This study will provide efficacy data on the potential for diet-by-microbiome pathways to promote better mental health-related outcomes in children.

References

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3. Dawson SL, Finlay-Jones A, Ball L, Rocks T, Jacka F. Supporting Maternal and Child Mental Health Through Dietary Changes Focused on the Gut Microbiota. *Psychiatr Ann.* 2022;52(2):51-5.

The Global burden of disease Lifestyle And mental Disorders (GLAD) Taskforce

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Background

The Global Burden of Disease study (GBD) provides critical evidence for local, regional, and global public health strategies by collecting risk-outcome data for dietary exposures and physical health outcomes. However, the GBD currently lacks such data for common mental disorder (CMD) outcomes. Therefore, we cannot yet quantify the potential reduction in CMD burden by eliminating these risk factors globally.

The Global burden of disease Lifestyle And mental Disorder Taskforce (GLAD; established 2022) will collaborate with the GBD and global experts to quantify this diet-CMD risk relationship.

Methods

To be considered by the GBD Committee, we are following four stages:

1. Systematically search and recruit relevant studies.
2. Determine Taskforce priorities at an international symposium (October 2022; 88 members from 14 countries).
3. Estimate study-level diet-CMD associations using GBD-approved, harmonised data analysis protocols.
4. Meta-analyse evidence for diet and CMDs, using GBD methods.

Results

Our search identified 48 relevant studies; of which 31 (n=455,000) have enrolled in GLAD (Australasia n=12, Italy n=2, The Netherlands n=3, Norway n=1, Spain n=3, UK n=8, and multi-country n=2). Stage 3 results are anticipated from December 2023. Stage 4 results are expected by December 2024.

Conclusion

GLAD will quantify the contribution of diet to CMDs at the population level; providing the GBD with necessary evidence to integrate diet as a risk factor for CMDs and evaluate the potential reduction in CMD burden by targeting poor diet. This has the potential to inform priority setting and public health policy decisions at the regional and global level.

Ultra-processed food consumption and mental health: a systematic review and meta-analysis of observational studies

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Background

Since previous meta-analyses, which were limited only to depression and by a small number of studies available for inclusion at the time of publication, several additional studies have been published assessing the link between ultra-processed food consumption and depression as well as other mental disorders.

Methods

We aimed to build on existing reviews and clarify the associations between consumption of ultra-processed food and mental disorders by conducting an updated synthesis and meta-analysis of the contemporary evidence base.

Results

Seventeen observational studies were included (N=385,541); 15 cross-sectional and two prospective. Greater ultra-processed food consumption was cross-sectionally associated with higher odds of the prevalence of depressive and anxiety symptoms, both when these outcomes were assessed together (common mental disorder symptoms odds ratio: 1.53, 95%CI 1.43 to 1.63) and separately (depressive symptoms odds ratio: 1.44, 95%CI 1.14 to 1.82; and, anxiety symptoms odds ratio: 1.48, 95%CI 1.37 to 1.59). Furthermore, a meta-analysis of prospective cohort studies demonstrated associations between greater ultra-processed food intake and an increased risk of incident depressive outcomes (hazard ratio: 1.22, 95%CI 1.16 to 1.28).

Conclusion

While we found evidence for associations of ultra-processed food consumption with the prevalence and incidence of adverse mental health, further rigorously designed prospective and experimental studies are needed to better understand directionality and causal pathways.