

Mental Health, Gluten and Personised Diet Therapy

May 2022



Justine Bold



www.worcester.ac.uk

Overview

How mental health conditions can impact eating and food related behaviours.

Key learnings and findings from the SHAPE project for people with severe mental health problems.

Food reactivity to gluten - how this can affect mood disorders and other mental health conditions.

Gluten's potential impact on mental health will be considered in the wider context of personalised diet therapy and interdisciplinary practice.

Introduction

Worked at University of Worcester on MSc in NT since Jan 2008, also work as Programme Director of CPD at Cardiff University in the Medical School, Centre for Medical Education. Fellow of Higher Education Academy.

Started to practice as NT in 2005, MBANT, CNHC.

Graduated in NT from BCNH, previous degrees and postgrad diplomas.

PhD student – publication route.

Start with some philosophy....

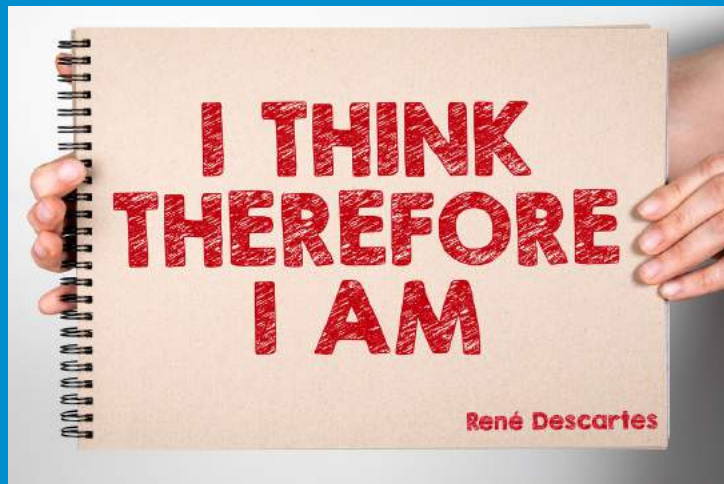


Image: istock



Cartesian dualism

- Descartes - 17th century.
- Proposed the mind and body were separate entities.
- This allowed medical practice outside of control of the Church.



Image: istock

Thibaut F. The mind-body Cartesian dualism and psychiatry. *Dialogues Clin Neurosci*. 2018;20(1):3. doi:10.31887/DCNS.2018.20.1/fthibaut

Mehta N. Mind-body Dualism: A critique from a Health Perspective. *Mens Sana Monogr*. 2011;9(1):202-209. doi:10.4103/0973-1229.77436

2011 paper

Mind body dualism still an issue in modern medicine

Mehta N. Mind-body Dualism: A
critique from a Health
Perspective. *Mens Sana Monogr.*
2011;9(1):202-209. doi:10.4103/0973-
1229.77436

Brain, Mind and Consciousness

CITATION: Mehta N., (2011), Mind-body dualism: A Critique from a Health Perspective. In: *Brain, Mind and Consciousness: An International, Interdisciplinary Perspective* (A.R. Singh and S.A. Singh eds.), *MSM*, 9(1), p202-209.

Mind-body Dualism: A Critique from a Health Perspective**

Neeta Mehta*

ABSTRACT

Philosophical theory about the nature of human beings has far reaching consequences on our understanding of various issues faced by them. Once taken as self-evident, it becomes the foundation on which knowledge gets built. The cause of concern is that this theoretical framework rarely gets questioned despite its inherent limitations and self-defeating consequences, leading to crisis in the concerned field. The field, which is facing crisis today, is that of medicine, and the paradigmatic stance that is responsible for the crisis is Cartesian dualism—a view that mind and body are essentially separate entities. This paper discusses Cartesian dualism in the context of the practice of medicine. Focusing more closely on how disease, health and treatment are defined through this position, the paper builds up its critique by throwing light on its accomplishments, limitations and self-defeating consequences. The paper also seeks to understand why this dualism is still alive despite its disavowal from philosophers, health practitioners and lay people.

Key Words: Mind-Body Dualism; Cartesian Dualism; Cartesian Dualism and Medicine

Introduction

Mind and body dualism represents the metaphysical stance that mind and body are two distinct substances, each with a different essential nature. Originated in the ancient period, a well-known version of dualism is credited

*PhD. Associate Professor, Department of Psychology, KET's V. G. Vaze College, Mulund East, Mumbai -400 081, India.

Address correspondence to: Dr. Neeta Mehta, 6, Phulrani, Sahitya Sahawas, Madhusudan Kalelkar Marg, Bandra, East, Mumbai - 400 051, India. E-mail: neetami90@hotmail.com

Received 29 Oct 2009. Accepted with revisions 2 Dec 2010. Revised 17, 18 Dec 2010. Final Acceptance 18 Dec 2010.

**Revised and peer reviewed version of a paper read at an International Seminar on Mind, Brain, and Consciousness, Thane College Campus, Thane, India, January 13-15, 2010.

MSM : www.msmonographs.org

DOI: 10.4103/0973-1229.77436

Legacy

- Silo working. Mental health and physical health problems treated separately.
- Physical health of patients with mental illness has been long over-looked.
- Despite the existence of many co-morbidities.



Mehta N. Mind-body Dualism: A critique from a Health Perspective. *Mens Sana Monogr.* 2011;9(1):202-209. doi:10.4103/0973-1229.77436

Image: istock

Links between physical and mental health explored in 2019 mainstream MH textbook



Augustus, J., Bold, J., Williams, B.
An Introduction to Mental Health, 2019.

Interdisciplinary text, written for MH nurses, social workers, doctors, paramedics, physician associates.

- Includes consideration of nutritional status, proteins, obesity, microbiome, gluten etc.

***How mental health can affect
food related behaviours....***



Mental health & eating

Can reduce appetite causing people to skip meals.

Some medications can impact appetite as well and influence cravings for carbohydrates such as sugar.

Rao TS, Asha MR, Ramesh BN, Rao KS. Understanding nutrition, depression and mental illnesses. *Indian J Psychiatry*. 2008;50(2):77-82. doi:10.4103/0019-5545.42391

There can be changes in palate as well as a result of certain mental health conditions e.g. in schizophrenia there are preferences for caffeinated drinks and hallucinations can also affect taste.

Werneke U, Taylor D, Sanders TA. Behavioral interventions for antipsychotic induced appetite changes. *Curr Psychiatry Rep*. 2013;15(3):347. doi:10.1007/s11920-012-0347-y

Mental health & eating

Metabolic changes as result of medication (particularly anti-psychotics) that affect metabolism and predispose to obesity and increased cardio-metabolic risk.

Maayan L, Correll CU. Management of antipsychotic-related weight gain. *Expert Rev Neurother*. 2010;10(7):1175-1200. doi:10.1586/ern.10.85

Think about effects on **planning, shopping, budgeting and cooking**. This may result in a reliance on convenience foods/shops and takeaway which over time can further impact a person's nutritional status.



SHAPE (Supporting Health And Promoting Exercise) Project for Young People with Psychosis and Bipolar Disorder:
First UK 'real world' service model



SHAPE Funding and Support

Health Foundation 2014 SHINE award £70K + £30K
Funded from June 2014 to September 2015

Ongoing access funded from personal budgets

Drinks bottles and step counters sponsored by
Postcode Anywhere Logo and design work gifted by
Concept Advertising and Public Relations Ltd



Ran at University of Worcester 2014-2017

Was set up and evaluated as an integrated programme **including nutrition care** to support young people with psychosis.

Now adopted by NHS in several areas in the Midlands. In the pandemic – there was a shift to online coaching.

Now managed in the NHS by health trainer who is Physical Health Activity Co-Ordinator.

SHAPE delivered in a number of NHS trusts across the Midlands

- North and South Worcestershire (Worcester, Malvern, Evesham, Kidderminster, Redditch, Bromsgrove)
- Dudley and Walsall
- Hereford (in partnership with a local fitness centre provider (Halo) and offered to service users from a range of different adult mental health services (not restricted to the FEP / EI service)
- Coventry and Warwickshire Partnership NHS Trust

Initially the project was focused on young people with severe mental illness (SMI)

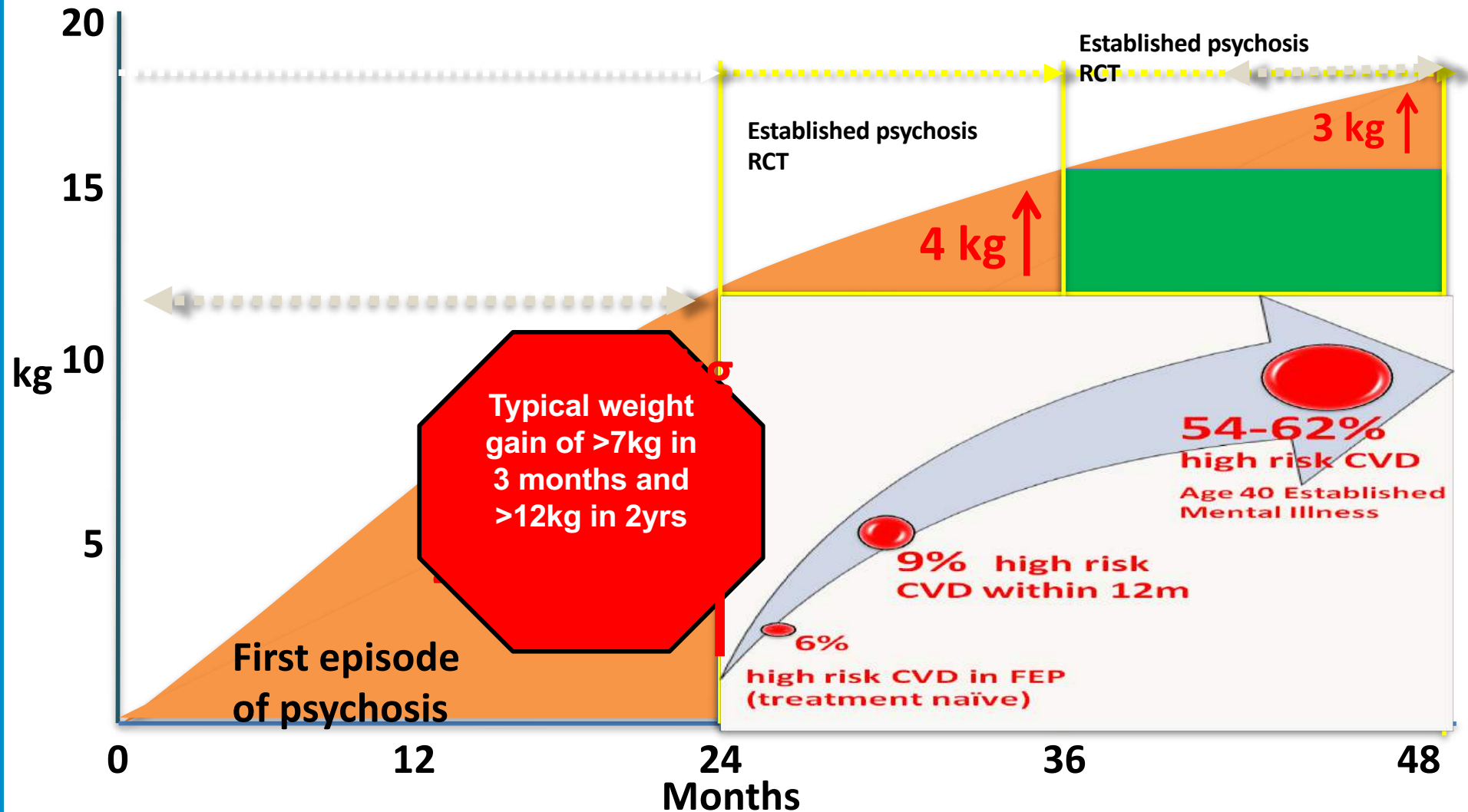
Including schizophrenia, bi-polar disorder, psychosis. First Episode. Then this was extended.

With severe mental illness in UK there is a huge health gap and currently this group has a reduced life expectancy of 15-20 yrs

Powis S Achieving more for people with severe mental illness 21 March 2019

<https://www.england.nhs.uk/blog/achieving-more-for-people-with-severe-mentalillness/#:~:text=The%20shocking%20figures%20are%20that,conditions%2>

RATIONALE - Young People with Psychosis are on a path to obesity, type 2 diabetes, cardiovascular disease and premature death linked to antipsychotic medication, poor diet, sedentary lifestyle and smoking



Alvarez-Jiménez M, González-Blanch C, Crespo-Facorro B, et al. Antipsychotic-induced weight gain in chronic and first-episode psychotic disorders: a systematic critical reappraisal. *CNS Drugs*. 2008;22(7):547-562. doi:10.2165/00023210-200822070-00002

Aims - part 1

- Engage young people with psychosis in relation to their physical health needs through a structured health and wellbeing programme.
- Improve cost efficiency of physical health monitoring and intervention via a 'one stop shop.'
- Improve access to health advice.

Aims – part 2

- Reduce tobacco smoking, substance use and improve diet and healthy lifestyle behaviours.
- Enhance quality of care plans addressing physical health concerns.

Objectives

- Review medication and side effects regularly to minimise the development of complications.
- Complete a documented physical health assessment within 6 weeks of initiating anti-psychotic medication.
- Maintain pre-illness weight levels or support weight loss to within 7% of pre-illness weight levels over 12 months.
- Maintain/reduce BMI, blood glucose, lipid profile and blood pressure within the normal range.

Intervention

12-week programme, with weekly, 90-minute sessions comprising a healthy behaviour education session, followed by a facilitated exercise session.

27 participants were recruited.

Anthropometric data from participants was collected at baseline, 12 weeks, and 12 months post-intervention.

Health behaviours were assessed at baseline and 12 months.

Data about health risk behaviours

Assessed using self-reported measures for diet (eating > 5 fruit/vegetables per day; equivalent to 400 g a day based on 80 g portions).

Tobacco use (current smoker or within last 6 months).

Alcohol use (Alcohol Use Disorders Identification Test).

Substance use (yes/no response).

PA levels (Exercise Vital Sign (EVS)). Sedentary behaviours were determined as engaging in PA less than < 90 min of moderate PA per week.

Programme

Session	Health Behavior Topic	Exercise Session Content	Supporting Tools
1	Introduction to SHAPE	Orientation to Fitness Center	Baseline assessment Tape measure SHAPE T-shirt
2	Goal setting	Cardiovascular training session	Goal setting Monitoring exercise intensity
3	Healthy Eating: Healthy Diet and Portion Sizes	Resistance training session	Cookbook Water bottle
4	Healthy Minds: Anxiety and Depression	Small team games: Badminton/basketball/handball	
5	Healthy Lifestyle: Smoking Cessation	Circuit training	
6	Healthy Lifestyle: Drugs and Psychosis	Individualized training	
7	Healthy Eating: Carer Session Healthy Snack Tasting Session	Walk for Health	Carer's session—social support Pedometer Cookbook Healthy snack sampling
8	Healthy Minds: Mindfulness	Yoga or Pilates	
9	Small Team Games: Badminton, Basketball, handball		
10	Healthy Eating: Menu Planning, Store Cupboard Items, and Shopping Lists	Tai Chi	Shopping Lists
11	Healthy Body: Dental and Sexual Health	Designing your own workout program Open exercise sessions	Individualized workout program
12	Goal setting, Post-intervention assessment, and Focus Group	Open exercise sessions	Goal setting

After 12 weeks offered 1:1 support in NT
teaching clinic



Project Team

Worcestershire EI in
Psychosis Service (WEIS)
McClelland Health and
Wellbeing Centre, University
of Worcester

The University of Worcester
Public Health trainers

Smoking cessation

Sexual health

South Worcestershire Clinical
Commissioning Group (CCG)



Evaluation published 2020

Available open
access.

<https://www.frontiersin.org/articles/10.3389/fendo.2020.577691/full>

Smith J, Griffiths LA, Band M, et al. Early Intervention in Psychosis: Effectiveness and Implementation of a Combined Exercise and Health Behavior Intervention Within Routine Care. *Front Endocrinol (Lausanne)*. 2020;11:577691. Published 2020 Oct 26. doi:10.3389/fendo.2020.577691



Early Intervention in Psychosis: Effectiveness and Implementation of a Combined Exercise and Health Behavior Intervention Within Routine Care

Jo Smith^{1*}, Lisa A. Griffiths², Marie Band³, Rachael Hird-Smith¹, Briony Williams¹, Justine Bold^{1,4}, Eleanor Bradley¹, Richard Dilworth¹ and Dominic Home¹

¹ School of Allied Health and Community, University of Worcester, Worcester, United Kingdom, ² Department of Nutrition, Food and Exercise Science, Florida State University, Tallahassee, FL, United States, ³ Moorfields Eye Hospital NHS Foundation Trust, London, United Kingdom, ⁴ Centre for Medical Education, Medical School, Cardiff University, Cardiff, United Kingdom

OPEN ACCESS

Edited by:
Jackie Curtis,
University of New South Wales,
Australia

Reviewed by:
Simon Rosenbaum,
University of New South Wales,
Australia
Scott B. Teasdale,
University of New South Wales,
Australia

***Correspondence:**
Jo Smith
jo.smith2@worc.ac.uk

Specialty section:
This article was submitted to
Obesity,
a section of the journal
Frontiers in Endocrinology

Received: 29 June 2020
Accepted: 30 September 2020
Published: 26 October 2020

Citation:
Smith J, Griffiths LA, Band M,
Hird-Smith R, Williams B, Bold J,
Bradley E, Dilworth R and Home D
(2020) Early Intervention in
Psychosis: Effectiveness and
Implementation of a Combined
Exercise and Health Behavior
Intervention Within Routine Care.
Front. Endocrinol. 11:577691.
doi: 10.3389/fendo.2020.577691

Aim: Young people with psychosis have higher rates of obesity, premature cardiovascular disease, and death compared to non-psychotic peers in the general population due to changes in metabolic regulation linked to antipsychotic medication and adverse health risk behaviors. The aim of this paper is to outline the development, implementation, and evaluation of a combined 12-week exercise and health behavior intervention delivered as part of an Early Intervention in Psychosis (EIP) routine service, within the UK.

Methods: Participants (n = 27) completed a 12-week combined intervention program, engaging in weekly, 90-min sessions comprising a healthy behavior education session (45 min), followed by a facilitated exercise session (45 min). Anthropometric data from participants (n = 26) were collected at baseline, 12 weeks, and 12 months post-intervention. Health behaviors and clinical measurements were assessed at baseline and 12 months.

Results: Mean baseline data suggests participants were at an increased health risk on entry to the program, with elevated values in mean body mass index (BMI; 70% overweight/obese), waist circumference, resting heart rate, and triglycerides. Fifty percent reported smoking daily, 64% ate < 5 fruits/vegetables per day, and 52% of participants were prescribed highly obesogenic antipsychotic medications (i.e., Olanzapine). At 12 weeks and 12 months, no changes were observed in mean BMI, waist circumference or any other clinical variable (p > 0.05). At 12 months, participants reported a positive impact on health behaviors including improved diet, increased physical activity levels, and cessation of substance use (n = 2), alcohol use (n = 2), and smoking (n = 4). Focus groups captured participant experiences, engagement with and satisfaction with the program, including challenges/barriers to program adherence.

Conclusions: The 12-week exercise and health behaviors program supported participants to attenuate their physical health risk which was sustained at 12-month

Results from abstract

Results: Mean baseline data suggests participants were at an increased health risk on entry to the program, with elevated values in mean body mass index (BMI; 70% overweight/obese), waist circumference, resting heart rate, and triglycerides. Fifty percent reported smoking daily, 64% ate < 5 fruits/vegetables per day, and 52% of participants were prescribed highly obesogenic antipsychotic medications (i.e., Olanzapine). At 12 weeks and 12 months, no changes were observed in mean BMI, waist circumference or any other clinical variable ($p > 0.05$). At 12 months, participants reported a positive impact on health behaviors including improved diet, increased physical activity levels, and cessation of substance use ($n = 2$), alcohol use ($n = 2$), and smoking ($n = 4$). Focus groups captured participant experiences, engagement with and satisfaction with the program, including challenges/barriers to program adherence.

Reference on previous slide

More detail on nutrition component from paper

5 out of 27

Changes in Health Risk Behaviors

Baseline self-report data identified a few adverse health risk behaviors among participants, notably: sedentary behavior, poor dietary intake, and smoking. Positive behavior changes in eating, PA, smoking, and substance use were reported by several participants at 12-month follow-up. These changes are important as they are among the top eight risk factors (alcohol use, tobacco use, high blood pressure, high body mass index, high cholesterol, high blood glucose, low fruit and vegetable intake, and physical inactivity) that account for 61% of cardiovascular deaths and combined, account for over three quarters of ischemic heart disease worldwide (80). The same WHO report identified that reducing these eight risk factors would increase life expectancy by almost five years.

Five participants reported positive changes in their eating habits reflected in eating 400 g equivalent of fruit/vegetables daily which is an important outcome in relation to tackling obesity and reducing the risk of CVD, diabetes, and premature mortality. Adequate consumption of fruit and vegetables reduces the risk for CVD, stomach cancer, and colorectal cancer (81, 82). Similarly, increases in PA are important in people with psychosis who have been shown to be more sedentary (83, 84) and, therefore, at greater risk of obesity and cardiometabolic diseases than their non-psychotic peers (85).

Reference on previous slide

QALYs

Quality
adjusted
life year

- In good
health

Weight maintenance and reduction has been linked to improved life expectancy of 2–3 years and a reduced QALY cost if patients can avoid a 7% weight gain (15, 78). Equally, changes in eating, PA, smoking, and alcohol use reported by several participants at 12-month follow-up could potentially increase life expectancy by almost 5 years (89). This does assume participant engagement and program retention and for reported outcomes to be maintained long enough to benefit from the health states associated with them. Based on this, the estimated intervention costs and QALYs improvements linked to SHAPE outcomes would suggest that the SHAPE program is likely to be a cost-effective and value for money intervention. More research is needed on cost effectiveness of physical health intervention programs in FEP considering the unique barriers young people face when engaging in an exercise and health behavior intervention (31, 32) and their impact on successful program engagement, adherence, and likely outcomes.

Reference on previous slides

Comparison of anthropometric measurements at baseline, 12 weeks, and 12 months

12-week post-intervention					
Variable	N	Baseline	12 weeks	Baseline to 12-week post	
Body mass (kg)	26	94.4 (23.1)	95.1 (23.4)	$t = 0.811, p = 0.43$	
BMI (kg.m ⁻²)	26	30.7 (7.2)	31.0 (7.4)	$t = 0.967, p = 0.34$	
Waist circumference (cm)	26	98.1 (17.0)	99.2 (16.8)	$t = 0.757, p = 0.46$	
12-month post-intervention					
Variable	N	Baseline	12 weeks	12months	Baseline to 12-month post
Body mass (kg)	11	99.0 (30.8)	100.0 (31.8)	100.8 (31.2)	$F = 0.551, p = 0.50$
BMI (kg.m ⁻²)	11	33.0 (9.6)	33.3 (9.8)	33.7 (9.9)	$F = 0.584, p = 0.48$
Waist circumference (cm)	10	98.2 (21.0)	99.6 (23.7)	99.7 (25.2)	$F = 0.258, p = 0.75$

Attenuated antipsychotic induced weight gain for the majority (75%) of participants. Just under 8% of participants at 12 weeks and 9% at 12 months gained more than 7% of their bodyweight.

Reference on previous slide

2017 added to NICE shared learning database

The screenshot shows the NICE website interface. At the top, the URL is [nice.org.uk/sharedlearning/shape-supporting-health-and-promoting-exercise-in-young-people-with-psychosis](https://www.nice.org.uk/sharedlearning/shape-supporting-health-and-promoting-exercise-in-young-people-with-psychosis). The NICE logo and name 'National Institute for Health and Care Excellence' are visible, along with a search bar and a 'Sign in' button. A navigation menu includes 'Guidance', 'Standards and indicators', 'Life sciences', 'British National Formulary (BNF)', 'British National Formulary for Children (BNFC)', 'Clinical Knowledge Summaries (CKS)', and 'About'. A yellow banner reads 'Read about [our approach to COVID-19](#)'. The breadcrumb trail is 'Home > NICE Guidance > Conditions and diseases > Mental health and behavioural conditions > Psychosis and schizophrenia'. The main heading is 'SHAPE: Supporting Health And Promoting Exercise in Young People with Psychosis'.

Shared learning database

Organisation: University of Worcester

Published date: January 2017

The need to address modifiable physical health risks proactively for people with psychosis has been embraced by NICE within recent guidance and quality standards (NICE CG178, NICE CG155, NICE QS80, NICE QS102). The guidance and standards recommend systematic CVD risk monitoring for all individuals from the outset, particularly in those prescribed antipsychotics. It also recommends offering a combined healthy eating and physical activity programme as well as support to stop smoking.

SHAPE (Supporting Health and Promoting Exercise) Programme offers a co-ordinated, multi-professional, 12 week wellbeing and exercise programme in a youth focused, socially inclusive setting for young people with early psychosis. Its clinical impact has been evaluated at 12 weeks and 12 months. Early outcome data on the clinical impact of SHAPE at 12 weeks and 12 months has shown a positive impact on key physical health risk markers and in promoting healthy lifestyle behaviours.

<https://www.nice.org.uk/sharedlearning/shape-supporting-health-and-promoting-exercise-in-young-people-with-psychosis>

Group exercise intervention – included peer support

- Moderate intensity.
- Utilising student (Earn As You Learn) and peer group support.
- Located in a youth focused, socially inclusive University gym setting.



Exercise prescription

Based on 'Physical Activity and Mental Health National Consensus.'

Biddle, S. J. H., Fox, K. R., & Boucher, S. H. Physical activity and psychological well-being. 2000.

- exercise 2-4 days per week for a duration of 20-30 minutes.
- at a moderate intensity and engaging in a wide range of exercises.
- total exercise duration (incl. warm-up and cool-down) approx. 45-60 mins.

Included badminton, basketball, walking, **gym circuits and resistance training** (gym induction/equipment introduction, individualised programmes in open gym sessions) and other **low impact exercise activities** (Tai Chi, Pilates).

Level 3 exercise referral fitness coach leading exercise sessions to gauge participants exercise intensity/duration to ensure within correct exercise prescription for the programme, monitor and adapt re medical issues.

Supporting behaviour change

- SHAPE workbook summarising content and practical tasks for each week to allow the participants to keep a progress record and use as a learning resource.
- Carers evening to engage support from family members.
- Motivational goal setting to review goals and maintain focus.
- Collaboration with primary care practitioners to reduce physical health risks.
- Referral for specialist assessment and treatment where required.

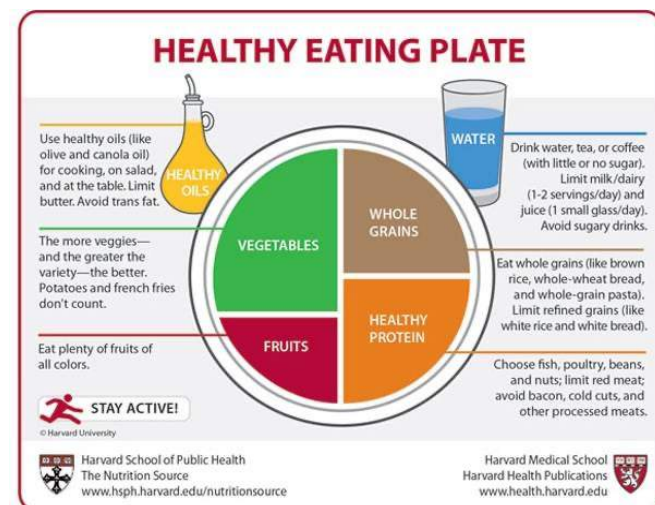
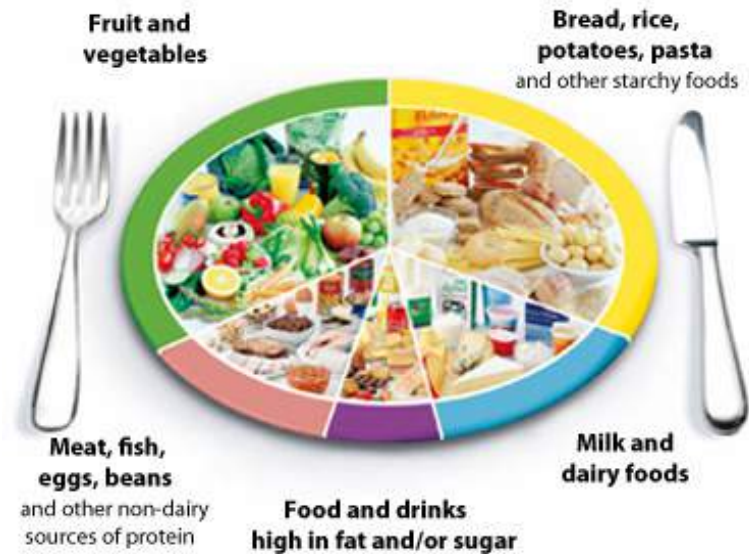
Nutrition support

- Enable participants to make healthier food & drink choices.
- Help off-set weight gain often associated with medication.
- Try to give practical advice & offer access to one to one support for **personalised nutritional advice.**



Week 3: Introduction to Healthy Eating

- Introduction to Healthy Eating.
- Review food groups.
- What makes a balanced diet.
- Talk about fruits & vegetables.
 - 5 a day (80g is a portion, potatoes don't count).
- Review resources:
 - Eatwell plate.
 - Harvard food plate.
- Portion sizes for meats, cheese, saturated fat.



Week 7: Menu Planning & Shopping Lists

- Review list of healthy store cupboard items that can make it easier to eat healthier at home.
 - Long life.
 - Convenience.
 - Economical.
- Tips for health menu planning over a week.
- Tips for healthy eating if buying food out.



Week 11: Healthy Snack tasting (risk assessment re nuts)



- Tasting session focusing on snacks.
 - Combination of sweet & savoury snacks to try.
 - Gives participants the opportunity to try new things without spending money in case they don't like them.
 - Hopefully this to help change behaviours.
 - Review food labels & cost.
 - Look at calorie content, sugar, salt & saturated fat content.
 - Opportunity to discuss & ask questions.





natures
oat biscuits
all natural
oat biscuits

natures
oat biscuits
all natural
oat biscuits

graze
protein power

Kindl
70% COCOA
DARK

URU'N FRUIT
MANGO
TO SNACK ON
THEY DO GO

New
115
metcalfe's
skinny popcorn
the original prepared popcorn
sweet 'n salt
lightly prepared naturally popped

graze
VEGGIE
PROTEIN
POWER

graze
protein power

Kalp



Other Resources & 1:1 nutrition support

- Participants offered a range of leaflets including some with menu planning tips & shopping lists & advice re. portion sizes.
 - NHS Change for Life
 - British Heart Foundation
 - Rethink Mental Illness
- Free cookbook (thanks to Alison Benbow).
- After the 12 weeks participants offered a 1:1 nutritional consultation – 1 hr 15 min session. 5 of the 27 had 1:1 NT sessions. Now dietician offers 1:1.



Focus Group comments about nutrition

*“I like the talking and nutrition parts. I also liked learning about drugs, I found it interesting”
(Focus Group 1).*

*“The sessions have been worthwhile and I have gotten more fit and I have lost weight”
(Focus group 1).*

“Dad noticed I had lost weight” .”(Focus Group 1)

“my husband helped – we changed our diet together” (Focus Group 1).

Learnings/impacts for me from SHAPE project



Monitoring physical health in SMI embedded in NHS care

- The need to address modifiable physical health risks proactively was embraced by NICE within guidance and quality standards (NICE CG178, NICE CG155, NICE QS80, NICE QS102).
- Guidance now recommend systematic CVD risk monitoring for all individuals from the outset, particularly in those prescribed antipsychotics.
- NICE also recommends offering a combined healthy eating and physical activity programme as well as support to stop smoking.



Interdisciplinary team working & multidisciplinary communication

- We presented findings at NHS improving quality conference and at British Dietetic Association Obesity Special Interest Group and a BDA Mental health group conference
- Wider dissemination of evaluation of project in academic publications
- Need for more mainstream education about role of nutrition – MH textbook published 2019



Gluten and mental illness

- Two of the initial cohort of subjects had a family history of coeliac disease (CD) – first degree relative
- Mental health nurse and lead investigator –who was a clinical psychologist were unaware of associations with gluten and CD
- Unable to get GP's to test for CD in absence of gastro-intestinal symptoms
- Highlighted the need for more research and education on this...



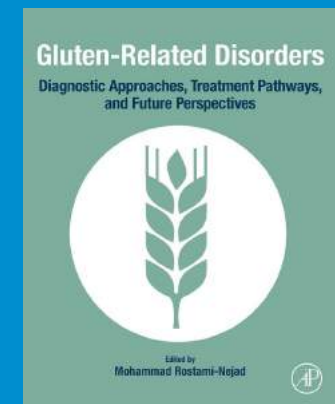
Projects building on these areas...



Worked collaboratively on research projects on gluten & MH / health, my role - supervising postgraduate student research and then helping in writing up for journal publications.

Interprofessional education - textbook chapter - for medics and nurses - details the many mechanisms of how gluten can affect nervous system, brain etc.

Bold J. Gluten and its main food sources and other components of grains that may impact on health. Published in Gluten Related Disorders Diagnostic Approaches, Treatment Pathways, and Future Perspectives Ed: Mohammad Rostami-Nejad 2021



Gluten & mood disorders

Systematic Review with Meta analysis - Written up from Ellie Busby's MSc dissertation


Available open access

Busby E, Bold J, Fellows L, Rostami K. Mood Disorders and Gluten: It's Not All in Your Mind! A Systematic Review with Meta-Analysis. *Nutrients*. 2018;10(11):1708. Published 2018 Nov 8. doi:10.3390/nu10111708



Review

Mood Disorders and Gluten: It's Not All in Your Mind! A Systematic Review with Meta-Analysis

Eleanor Busby ¹, Justine Bold ^{1,*}, Lindsey Fellows ¹ and Kamran Rostami ² 

¹ The School of Allied Health and Community, University of Worcester, Worcester WR2 6AJ, UK; buse1_17@uni.worc.ac.uk (E.B.); l.fellows@worc.ac.uk (L.F.)

² Department of Gastroenterology, Mid-Central District Health Board, Palmerston North Hospital, Palmerston North 4442, New Zealand; kamran.rostami@midcentraldhsb.govt.nz

* Correspondence: j.bold@worc.ac.uk; Tel.: +44-1905-855-391

Received: 14 October 2018; Accepted: 6 November 2018; Published: 8 November 2018



Abstract: Gluten elimination may represent an effective treatment strategy for mood disorders in individuals with gluten-related disorders. However, the directionality of the relationship remains unclear. We performed a systematic review of prospective studies for effects of gluten on mood symptoms in patients with or without gluten-related disorders. Six electronic databases (CINAHL, PsycINFO, Medline, Web of Science, Scopus and Cochrane Library) were searched, from inception to 8 August 2018, for prospective studies published in English. Meta-analyses with random-effects were performed. Three randomised-controlled trials and 10 longitudinal studies comprising 1139 participants fit the inclusion criteria. A gluten-free diet (GFD) significantly improved pooled depressive symptom scores in GFD-treated patients (Standardised Mean Difference (SMD) -0.37 , 95% confidence interval (CI) -0.55 to -0.20 ; $p < 0.0001$), with no difference in mean scores between patients and healthy controls after one year (SMD 0.01 , 95% CI -0.18 to 0.20 , $p = 0.94$). There was a tendency towards worsening symptoms for non-coeliac gluten sensitive patients during a blinded gluten challenge vs. placebo (SMD 0.21 , 95% CI -0.58 to 0.15 ; $p = 0.25$). Our review supports the association between mood disorders and gluten intake in susceptible individuals. The effects of a GFD on mood in subjects without gluten-related disorders should be considered in future research.

Keywords: gluten-related disorders; gluten-free diet; coeliac disease; non-coeliac gluten sensitivity; irritable bowel syndrome; mood disorders; affective disorders; depression; major depressive disorder; mental health; nutrition

1. Introduction

Mood disorders are a global healthcare burden, with 300 million people now suffering from depression worldwide [1]. In 2015, the World Health Organisation (WHO) estimated that 4.4% of the global population were suffering from clinical depression—a 18.4% increase in prevalence since 2005. On top of this, around 61 million antidepressants are prescribed in a single year in the UK alone [2], while depressive disorders were ranked as the largest contributor to global non-fatal health loss, as well as increased suicide risk [3].

Wheat products are now the main source of carbohydrate in the Western diet and contain high amounts of the protein, gluten. In recent years, reports of gastrointestinal and extra-intestinal symptoms, due to gluten-containing foods have been on the increase [4]. Coeliac disease (CD) is characterised by intestinal mucosal damage due to an immune response to gluten peptides, with clinical improvement after following a gluten-free diet (GFD) [5]. This involves the elimination of gluten-containing foods from the diet, such as wheat, rye and barley products. CD affects about 1% of the UK population [6] and its global prevalence is on the rise [7]. Moreover, around 10%



Figure 1. Flow diagram of study selection. #, number.

PRISMA

13 studies met inclusion criteria, 3 RCTs, 10 longitudinal studies – 1139 participants

Reference on previous slide

Abstract

Abstract: Gluten elimination may represent an effective treatment strategy for mood disorders in individuals with gluten-related disorders. However, the directionality of the relationship remains unclear. We performed a systematic review of prospective studies for effects of gluten on mood symptoms in patients with or without gluten-related disorders. Six electronic databases (CINAHL, PsycINFO, Medline, Web of Science, Scopus and Cochrane Library) were searched, from inception to 8 August 2018, for prospective studies published in English. Meta-analyses with random-effects were performed. Three randomised-controlled trials and 10 longitudinal studies comprising 1139 participants fit the inclusion criteria. A gluten-free diet (GFD) significantly improved pooled depressive symptom scores in GFD-treated patients (Standardised Mean Difference (SMD) -0.37 , 95% confidence interval (CI) -0.55 to -0.20 ; $p < 0.0001$), with no difference in mean scores between patients and healthy controls after one year (SMD 0.01 , 95% CI -0.18 to 0.20 , $p = 0.94$). There was a tendency towards worsening symptoms for non-coeliac gluten sensitive patients during a blinded gluten challenge vs. placebo (SMD 0.21 , 95% CI -0.58 to 0.15 ; $p = 0.25$). Our review supports the association between mood disorders and gluten intake in susceptible individuals. The effects of a GFD on mood in subjects without gluten-related disorders should be considered in future research.

Reference on previous slide



What does this mean in practice?

We found that a gluten-free diet (GFD) may reduce symptoms of depression in people with coeliac disease (CD), those at risk of CD and those with non-coeliac gluten sensitivity (NCGS).

When participants with NCGS were given a capsule of gluten or a placebo everyday for 3-5 days without knowing which they received, there was a trend towards worsening symptoms of depression in the group receiving gluten.



Effect?

GFD improved the average depression of the study groups to that of the same level of the control group (general population) after about one year of following the diet. Although we observed no difference between subjects with CD, irritable bowel syndrome (IBS) and NCGS, the majority of studies were conducted in those with CD; hence, the evidence for a GFD reducing depression in CD is the strongest due to the higher amount of studies with more patients.



Reasons for Gluten avoidance

Lucy Harper's MSc dissertation

Available open access

Harper L, Bold J. An exploration into the motivation for gluten avoidance in the absence of coeliac disease. *Gastroenterol Hepatol Bed Bench*. 2018;11(3):259-268.

Gastroenterology and Hepatology From Bed to Bench.
©2018 RIGLD, Research Institute for Gastroenterology and Liver Diseases

ORIGINAL ARTICLE

An exploration into the motivation for gluten avoidance in the absence of coeliac disease

Lucy Harper¹, Justine Bold²

¹Freelance Nutritional Therapist, UK

²Allied Health and Social Sciences, University of Worcester, Worcester, WR2 6AJ, UK

ABSTRACT

Aim: To explore the motivation for gluten avoidance in the absence of coeliac disease (CD) and ascertain what symptoms are triggered by gluten and what beliefs/reasons influence this decision.

Background: Links between physical/psychological symptoms and gluten in CD are well known but less is known about those who self-select a gluten-free diet (GFD) in the absence of CD.

Methods: An empirical study using responses to an anonymous on-line questionnaire. Closed questions were used as a screening tool to exclude participants who had CD, wheat allergy or were following a low FODMAP diet. Data from participants using a GFD in the absence of a medical diagnosis was then analysed using thematic analysis.

Results: 120 initial responses, 87 were completed in full. 23 respondents fulfilled the inclusion criteria for thematic analysis. 7 different themes emerged, including one for signs/symptoms. Other themes identified included difficulties of a GFD, health beliefs, feelings and influence on decision to follow a GFD. Responses indicate that the reasons for gluten avoidance are in the most part reasoned and logical and were based around participants' self-management of symptoms.

Conclusion: Symptoms included those typical of irritable bowel syndrome (IBS), but also infertility, low mood/energy, immune function and weight management and visual and auditory hallucinations. It appears the majority of responses analysed thematically could fit into the spectrum of non-coeliac gluten sensitivity (NCGS). Findings also suggest more support at all levels of medical care may help patients establish if it is gluten, rather than wheat or FODMAPs particularly fructans that are contributing to signs/symptoms.

Keywords: Non-coeliac gluten sensitivity, Non-coeliac wheat sensitivity, Gluten intolerance, Gluten-free, Coeliac disease, Self-management of symptoms.

(Please cite as: Harper L, Bold J. An exploration into the motivation for gluten avoidance in the absence of coeliac disease. *Gastroenterol Hepatol Bed Bench* 2018;11(3):259-268).

Introduction

There has been an exponential growth in the gluten-free (GF) foods market. This may be due to increasing consumer awareness of the contribution or *perceived* contribution of gluten to negative health beliefs and physical or psychological signs/symptoms. Since 2011, the gluten-free market has been increasing at 12.6% a year (1) but the number of people diagnosed with Coeliac Disease (CD), a chronic inflammatory disorder of the small bowel,

requiring strict adherence to a gluten-free diet (GFD) to maintain health is not increasing at this rate (2). A UK population based study (3) found a fourfold increase in the incidence of CD over a 22-year period – even this however would not account for the growth in the GF market.

It has been suggested that the growth in the GF market could be down to people following 'fad' diets (4-6). Other possible contributory factors are the endorsement of GFD by celebrities and sportspeople (7) and of the publication of international bestselling books such as 'Wheat Belly' by Dr Davis (8) or 'Grain Brain' by Dr Perlmutter (9). It could be argued that with higher levels of internet usage, there is

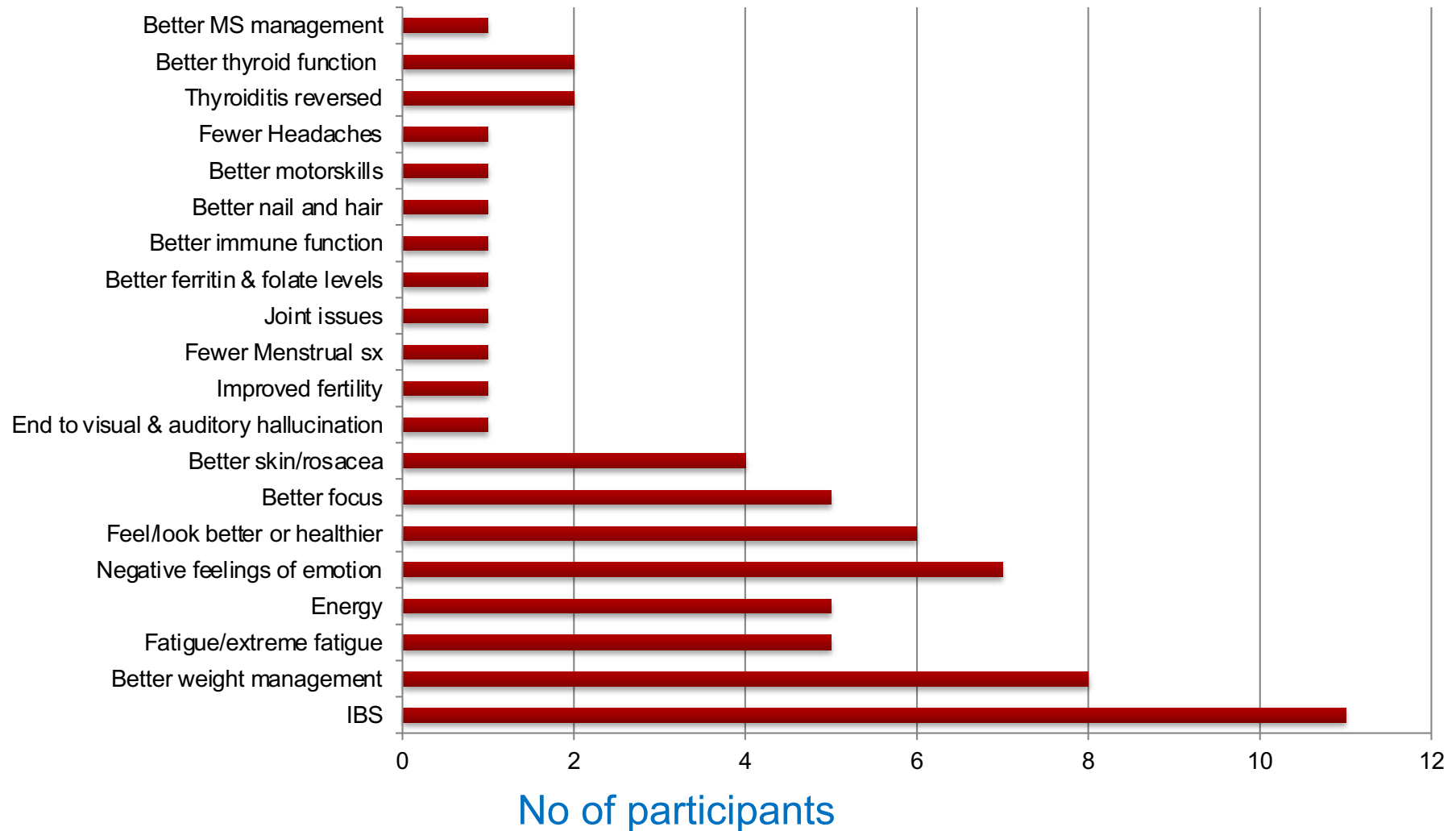
Received: 17 March 2018 Accepted: 18 May 2018

Reprint or Correspondence: Justine Bold, PhD, Allied Health and Social Sciences, University of Worcester, Worcester, WR2 6AJ, UK.

E-mail: j.bold@worc.ac.uk

Thematic analysis findings re symptoms include MH issues

Respondents experiences of symptom improvements on GFD



This mirrors case reports in literature

Gluten Psychosis - Case report: 14 yr old girl

After a febrile episode experienced headache and poor concentration, hallucinations, weight loss, abdominal distension and severe constipation

Blood test, scan all normal but anti gliadin antibody positive. Autoimmune encephalitis suspected and treated with steroid

Lionetti E, Leonardi S, Franzonello C, Mancardi M, Ruggieri M, Catassi C. Gluten Psychosis: Confirmation of a New Clinical Entity. *Nutrients*. 2015;7(7):5532-5539. Published 2015 Jul 8. doi:10.3390/nu7075235

No significant changes in signs/symptoms
increase in faecal calprotectin values (350 mg/dL,
normal range: 0–50 mg/dL)

Prescribed anti-psychotic (olanzapine) but
signs/symptoms persisted

After further weight loss, saw dietician, GFD
recommended. Within a week all symptoms improved
double blind placebo controlled challenge and non
coeliac gluten sensitivity diagnosed

Lionetti E, Leonardi S, Franzonello C, Mancardi M, Ruggieri M, Catassi C. Gluten
Psychosis: Confirmation of a New Clinical Entity. *Nutrients*. 2015;7(7):5532-5539.
Published 2015 Jul 8. doi:10.3390/nu7075235

Some history – MH & gluten

In the 1950s an association between gluten and schizophrenia was described and it was also noted that patients with CD experienced mood improvements on a gluten free diet

In the 1970s studies demonstrated that a higher than normal proportion of patients with coeliac disease could be classified as having mild affective disorders

Casella G, Pozzi R, Cigognetti M, et al. Mood disorders and non-celiac gluten sensitivity. *Minerva Gastroenterol Dietol.* 2017;63(1):32-37. doi:10.23736/S1121-421X.16.02325-4

1990s - Gluten and schizophrenia

A higher prevalence of coeliac disease in patients with schizophrenia than non-psychiatric controls (3.4% vs 0.3%)

Mäkikyrö T, Karvonen JT, Hakko H, et al. Comorbidity of hospital-treated psychiatric and physical disorders with special reference to schizophrenia: a 28 year follow-up of the 1966 northern Finland general population birth cohort. *Public Health*. 1998;112(4):221-228. doi:10.1038/sj.ph.1900455

Gluten free diet in epilepsy

Systematic review with narrative synthesis From Zoe Gilbey's MSc dissertation

Available open access

Gilbey Z, Bold J. A Gluten Free Diet in the Management of Epilepsy in People with Coeliac Disease or Gluten Sensitivity. *Gastrointestinal Disorders*. 2020; 2(3):281-299.
<https://doi.org/10.3390/gidisord2030026>



Review

A Gluten Free Diet in the Management of Epilepsy in People with Coeliac Disease or Gluten Sensitivity

Zoë Gilbey¹ and Justine Bold^{1,2,*} 

¹ School of Allied Health & Community, University of Worcester, Worcester WR2 6AJ, UK; gilz1_16@uni.worc.ac.uk

² Centre for Medical Education, Medical School, Cardiff University, Cardiff CF14 4YS, UK

* Correspondence: j.bold@worc.ac.uk

Received: 2 August 2020; Accepted: 3 September 2020; Published: 8 September 2020



Abstract: The aim of this review was to assess the effects of a gluten free diet (GFD) in the management of epilepsy in people with coeliac disease (CD) or gluten sensitivity (GS). A systematic approach was used to undertake a literature review. Five electronic databases (PubMed; Scopus; Google Scholar; Cochrane Epilepsy Group specialised register; Cochrane Register of Controlled Trials (CENTRAL) via the Cochrane Register of Online Trials) were searched using predetermined relevant search terms. In total, 668 articles were identified. Duplicates were removed and predefined inclusion and exclusion criteria were applied, and a PRISMA flow chart was produced. Data was extracted using Covidence software. Twelve studies on Epilepsy and CD involving a total of 70 participants were selected for analysis; narrative synthesis was used owing to the small sample sizes in the selected studies. None of the 12 studies meeting inclusion criteria investigated gluten sensitivity and epilepsy. All the included studies support a link between epilepsy and CD. GFD was effective in 44 out of 70 participants across the studies in terms of a reduction of seizures, reduction of antiepileptic drugs (AEDs) or normalisation of EEG pattern. A total of 44 participants showed a reduction in seizures (across eight studies) and complete cessation of seizures was reported in 22 participants. In general, the earlier the GFD is implemented after the onset of seizures, the better the likelihood of the GFD being successful in supporting control of seizures. Mechanisms linking gluten with epilepsy are not fully understood; possible hypotheses include gluten mediated toxicity, immune-induced cortical damage and malabsorption. Evidence suggests the effectiveness of a GFD in supporting the management of epilepsy in patients with CD, although the quality of evidence is low. There appears to be a growing number of neurologists who are prepared to advocate the use of a GFD. A multidisciplinary approaches and further research are recommended. It could be argued that when balancing potential treatments such as AEDs or surgery, a GFD has a low likelihood of harm.

Keywords: epilepsy; seizures; ketogenic diet; gluten free diet; coeliac disease; non-coeliac gluten sensitivity; gluten ataxia

1. Introduction

1.1. Epilepsy

Epilepsy is a neurological disorder that affects around 70 million people worldwide [1]. It can have a significant effect on the quality of life of those affected and their families [2]. Seizures are usually sudden, acute and unpredictable. People with epilepsy and their cohabiting relatives report higher levels of anxiety, depression and social anxiety disorders compared with the general population [3]. Epilepsy is not one disorder, but a term used to describe several conditions that share seizures as a common element [4]. There are over 40 different types of seizure [5] and the seizure type and

Abstract

Abstract: The aim of this review was to assess the effects of a gluten free diet (GFD) in the management of epilepsy in people with coeliac disease (CD) or gluten sensitivity (GS). A systematic approach was used to undertake a literature review. Five electronic databases (PubMed; Scopus; Google Scholar; Cochrane Epilepsy Group specialised register; Cochrane Register of Controlled Trails (CENTRAL) via the Cochrane Register of Online Trials) were searched using predetermined relevant search terms. In total, 668 articles were identified. Duplicates were removed and predefined inclusion and exclusion criteria were applied, and a PRISMA flow chart was produced. Data was extracted using Covidence software. Twelve studies on Epilepsy and CD involving a total of 70 participants were selected for analysis; narrative synthesis was used owing to the small sample sizes in the selected studies. None of the 12 studies meeting inclusion criteria investigated gluten sensitivity and epilepsy. All the included studies support a link between epilepsy and CD. GFD was effective in 44 out of 70 participants across the studies in terms of a reduction of seizures, reduction of antiepileptic drugs (AEDs) or normalisation of EEG pattern. A total of 44 participants showed a reduction in seizures (across eight studies) and complete cessation of seizures was reported in 22 participants. In general, the earlier the GFD is implemented after the onset of seizures, the better the likelihood of the GFD being successful in supporting control of seizures. Mechanisms linking gluten with epilepsy are not fully understood; possible hypotheses include gluten mediated toxicity, immune-induced cortical damage and malabsorption. Evidence suggests the effectiveness of a GFD in supporting the management of epilepsy in patients with CD, although the quality of evidence is low. There appears to be a growing number of neurologists who are prepared to advocate the use of a GFD. A multidisciplinary approaches and further research are recommended. It could be argued that when balancing potential treatments such as AEDs or surgery, a GFD has a low likelihood of harm.

Reference on previous slide

Possible mechanisms

hypotheses for potential mechanisms for the association between gluten and epilepsy which were identified by this study. The hypotheses that emerged are:

1. Gluten mediated toxicity;
2. Gluten involved immune-induced cortical damage; and
3. CD related malabsorption of nutrients.

5.2. Gluten Mediated Toxicity

Researchers have proposed the theory that gliadin might have a direct toxic effect on the nervous system and specific brain cells [68]. The only study included in this review that explored gliadin toxicity and seizures, was Gerace et al. [64]. The remaining studies acknowledge toxicity as a potential mechanism linking epilepsy with CD. Gliadin toxicity leading to neuronal damage was suggested [65]. Although kainate is not a cause of seizures in human cases, the use of animal models in this way to replicate epilepsy is generally considered highly valid because they closely reproduce the symptoms and biochemical characteristics of the human disease [69]. Some researchers have theorised that antibodies related to CD may be toxic for neurons and trigger the development of epilepsy [45,70].

The EI manifestations of NCGS affect the nervous system, but also other areas of the body such as the skin and musculoskeletal system [40] and may also include the reproductive system [41]. A number of studies have explored gluten sensitivity with EI manifestations such as tiredness, headache, brain fog [42,43] and neurological and psychiatric disorders such as ataxia [44], anxiety and depression [45–47], schizophrenia [48] and epilepsy [49]. For most patients with a neurological manifestation of GS, there are no GI symptoms [50]. Less than 10% of patients with gluten ataxia experience GI symptoms [51]; just over a third will be negative for deaminated-gliadin peptide and tTG2 antibodies [52] but almost three quarters will have circulating antibodies to tissue transglutaminase-6 (TG6) which is primarily associated with the brain [52] and has been associated with CD, epilepsy and cerebral calcifications (CEC) [53].

Exorphins

May also be involved in the comorbidity of mental health and neurological problems in patients with CD.

Stefanucci A, Mollica A, Macedonio G, Zengin G, Abdelkareem AA, Novellino E. Exogenous opioid peptides derived from food proteins and their possible uses as dietary supplements: a critical review. *Food Rev Int* 2018;34(1):70-86.

Hypothesised they mask GI symptoms of CD (owing to the opioid effects), and this is responsible for asymptomatic presentation in silent or atypical CD.

It has also been demonstrated that they can increase transit time.

de Punder K, Pruimboom L. The dietary intake of wheat and other cereal grains and their role in inflammation. *Nutrients* 2013;5(3):771-87.

Exorphins

- They are exogenous peptides with opioid activity produced by the action of the proteolytic enzymes - they are considered to be both neurotransmitters and neuro-hormones.
- Share a common terminal amino acid sequence (known as an opioid motif) with enkaphalins, endorphins and dynorphins.
- The bacterial enzyme elastase (which can be elevated in microbiome dysbiosis) can also produce exorphins.

Stefanucci A, Mollica A, Macedonio G, Zengin G, Abdelkareem AA, Novellino E. Exogenous opioid peptides derived from food proteins and their possible uses as dietary supplements: a critical review. *Food Rev Int* 2018;34(1):70-86.

Nutritional therapy

Food first in general – but sometimes use supplements first if long term poor diet (check interactions with medication).

Include more gluten free grains – easy convenient sources: oat cakes, rice cakes, good gluten free pasta etc

Variety of grains, low grain diets, before trying a gluten free diet consideration of **ALL GRAIN FACTORS** fodmaps ATI, WGA, exorphins etc

Testing – Refer on re CD testing/ diagnosis

Nutritional therapy

If NCGS suspected could after GFD very slowly explore grain tolerance – quality of life

- Sourdoughs
- Organic grains/wheat

Support for gut mucosa/microbiome:

- Live fermented foods
- Fibre
- Rainbow diet – nutrient dense
/ phytonutrition

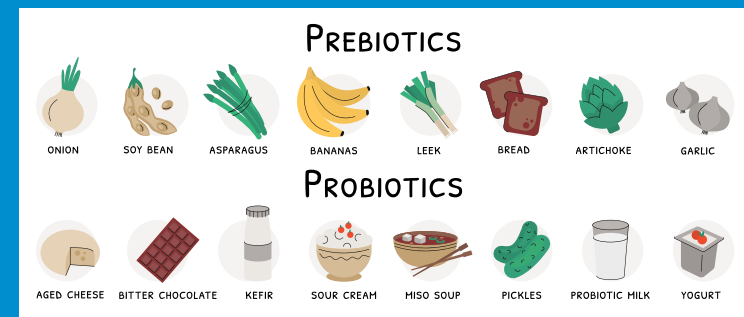


Image: istock

Therapeutic considerations

Trauma as psychological injury ?

- Helpful reframing if there is trauma issue


Lived experience of mental illness, particularly severe mental illness

- Stigmatisation

Recovery

- Recovery may not be focus of much treatment
- Those with MH issues can become medicalized
 - Perpetuating...

Thank you for listening

- Questions via panel
- Worcester virtual stand
- j.bold@worc.ac.uk  *@justineboldfood*



justine_bold



Nutrition Health Worcester