



## *Diet quality and depression and anxiety*

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The latest WHO report acknowledges that largely preventable, lifestyle driven illnesses now account for nearly two-thirds of deaths across the globe

# Mental health?

Common mental disorders = depression and anxiety

# Burden of illness

WHO has identified unipolar depression as the illness accounting for the **largest burden of disease** in middle and high income countries, exceeding that of ischemic heart disease

# Prevalence of mood and anxiety disorders in Australian women

- Approximately, 1 in 3 women (34.8%) reported a lifetime history of any mood or anxiety disorder

**WOMEN'S HEALTH**

## The prevalence of mood and anxiety disorders in Australian women

Lana Williams, Felice Jacka, Julie Pasco, Margaret Henry, Seetal Dodd, Geoffrey Nicholson, Mark Kotowicz and Michael Berk

**Objective:** We aimed to report the prevalence, age-of-onset and comorbidity of mood and anxiety disorders in an age-stratified representative sample of Australian women aged 20 years and over.

**Method:** Mood and anxiety disorders were diagnosed utilising a clinical interview (SCID-I/NP). The lifetime and current prevalence of these disorders was determined from the study population (n=1095) and standardized to 2006 census data for Australia.

**Results:** Approximately one in three women (34.8%) reported a lifetime history of any mood and/or anxiety disorder, with mood disorders (30.0%) being more prevalent than anxiety disorders (13.3%). Of these, major depression (23.4%), panic disorder (5.5%) and specific phobia (3.3%) were the most common. The lifetime prevalence of other disorders was low ( $\leq 3\%$ ). A total of 14.4% of women were identified as having a current mood and/or anxiety disorder, with similar rates of mood (8.9%) and anxiety disorders (8.0%) observed. The median age-of-onset for mood disorders was 27.0 years and 18.5 years for anxiety disorders.

**Conclusions:** This study reports the lifetime and current prevalence of mood and anxiety disorders in the Australian female population. The findings emphasize the extent of the burden of these disorders in the community.

**Key words:** anxiety disorders, epidemiology, females, mood disorders, prevalence.

Community-based surveys conducted worldwide<sup>1-5</sup> have indicated that mood and anxiety disorders are prevalent in the general population and are associated with a wide range of disabilities and functional impairments. In light of these findings, these psychiatric disorders are now recognized as a leading contributor to the global disease burden.<sup>6</sup>

Large-scale epidemiological studies conducted in various countries worldwide have yielded lifetime prevalence rates of mood and anxiety disorders ranging between 0.3–25.0% and 4.8–31.0%, respectively.<sup>7</sup> In Australia, data from the 1997 National Survey of Mental Health and Wellbeing (NSMHW) demonstrated that approximately one in five adults had experienced a psychiatric disorder in the previous 12 months,<sup>8</sup> while more recent data indicate that 14.4%, 6.2% and 5.1% have had a 12-month anxiety, mood or substance-use disorder, respectively.<sup>9</sup>

Subthreshold psychological symptomatology is even more prevalent and is known to be associated with more service utilization and social morbidity than threshold disorders.<sup>9,10</sup> Furthermore, longitudinal data indicate that individuals with subsyndromal depressive symptoms are more than four times more likely to develop *de novo* major depression within one year.<sup>11</sup> In Australia, 12.9% of adults were identified with current subsyndromal

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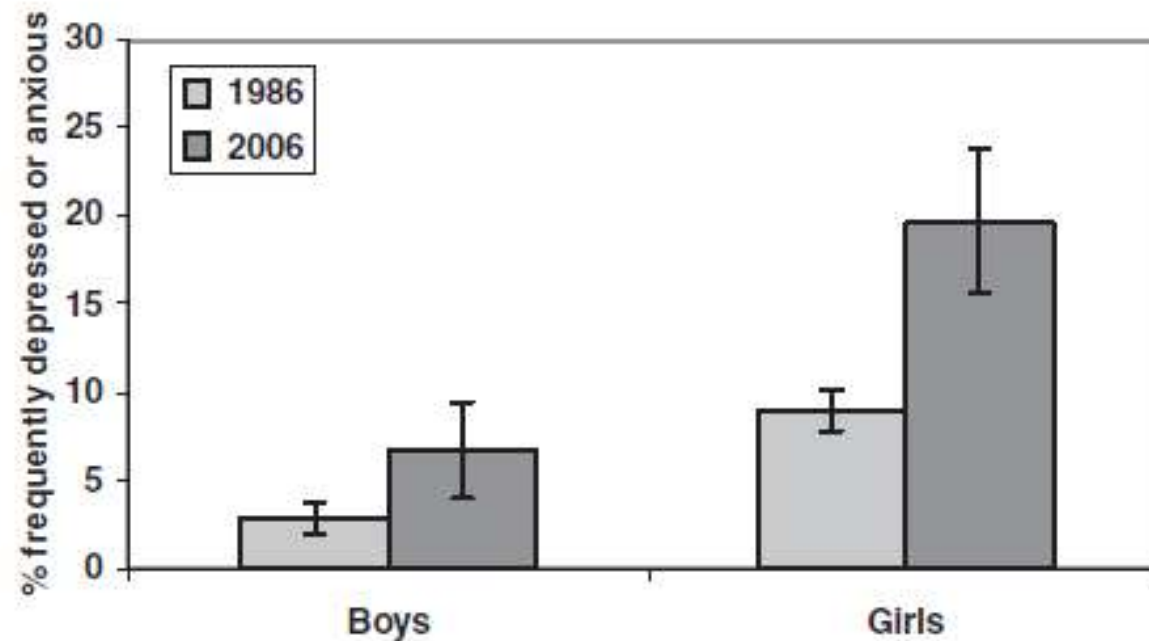
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RIGHTS LINK

**Early age of onset!!**

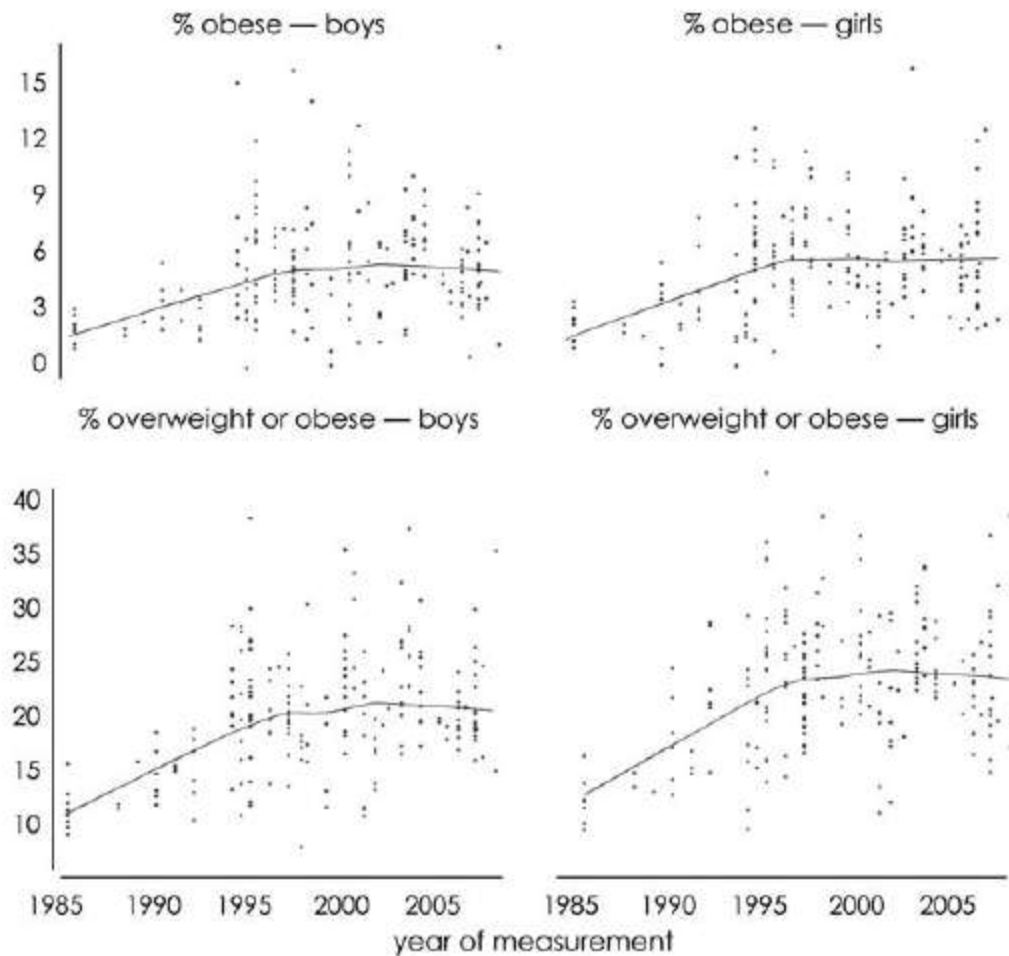
**Anxiety disorders = 6ys old**

**Depressive disorders = 13ys old**



**Figure 1** Percentage of youth reporting frequent feelings of anxiety or depression.  $N = 5436$  in 1986 and  $N = 716$  in 2006. Error bars indicate 95% CIs

## Increases in Obesity over 20 years - adolescents



**Figure 2** Lowess curves (tension=66) showing trends in the prevalence of obesity alone (top panels) and overweight and obesity (bottom panels) for boys (left-hand panels) and girls (right-hand panels).



**DIET**

Article

# Association of Western and Traditional Diets With Depression and Anxiety in Women

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**Objective:** Key biological factors that influence the development of depression are modified by diet. This study examined the extent to which the high-prevalence mental disorders are related to habitual diet in 1,046 women ages 20–93 years randomly selected from the population.

**Method:** A diet quality score was derived from answers to a food frequency questionnaire, and a factor analysis identified habitual dietary patterns. The 12-item General Health Questionnaire (GHQ-12) was used to measure psychological symptoms, and a structured clinical interview was used to assess current depressive and anxiety disorders.

**Results:** After adjustments for age, socioeconomic status, education, and health behaviors, a "traditional" dietary pattern characterized by vegetables, fruit, meat, fish, and whole grains was associated with lower odds for major depression or dysthymia and for anxiety disorders. A "western" diet of processed or fried foods, refined grains, sugary products, and beer was associated with a higher GHQ-12 score. There was also an inverse association between diet quality score and GHQ-12 score that was not confounded by age, socioeconomic status, education, or other health behaviors.

**Conclusions:** These results demonstrate an association between habitual diet quality and the high-prevalence mental disorders, although reverse causality and confounding cannot be ruled out as explanations. Further prospective studies are warranted.

(Am J Psychiatry Jacka et al.; AIA:1–7)

In recent years, the global burden of chronic lifestyle-mediated, noncommunicable diseases, such as cardiovascular disease, obesity, and type 2 diabetes, has become substantial, largely owing to changes in the dietary and exercise habits of populations in the developed and developing world (1). Depression and anxiety are also highly prevalent chronic illnesses (2, 3), yet while diet and nutrition modulate biological processes underpinning depressive illnesses (4), such as inflammation (5), brain plasticity and function (6, 7), the stress response system (8), and oxidative processes (9), psychiatry lacks evidence-based primary prevention and treatment strategies based on dietary modification.

Previous studies regarding the association between diet and depressive illness have focused on individual nutrients or food groups (for instance, see references 10–12). However, studying individual nutrients or foods may provide an incomplete picture of the relationship between diet and mental health, given the complex interactions among nutrients in our daily diets (13). Overall dietary intake is better assessed by using a composite measure, such as a dietary quality score derived from recommended national diet guidelines or dietary patterns as derived from factor analyses (13). The aim of this study was thus to examine the cross-sectional association of habitual diet

quality and the high-prevalence mental disorders in an epidemiological study of Australian women. We hypothesized that a better diet quality would be associated with a lower likelihood of depressive and anxiety disorders and with fewer psychological symptoms.

## Method

### Geelong Osteoporosis Study

The Geelong Osteoporosis Study is a large epidemiological study involving women selected from compulsory Australian Commonwealth electoral rolls for the Barwon Statistical Division. An age-stratified, randomly selected population-based sample of 1,494 women (ages 20–94 years) was recruited between 1994 and 1997, with participation of 77.1%. These women have continued to return for biennial follow-up assessments. Between 2004 and 2008, 881 of the original participants returned for a 10-year follow-up appointment, and the response rate among eligible women was 82.1%. An additional sample of women ages 20–29 years was recruited between 2004 and 2008, with a response rate of 70.9%. This allowed for continuing investigation in the full adult age range. Of the 1,127 women who participated in the 10-year follow-up, participants for whom psychiatric or dietary data were not available at the time of the study (N=81) were excluded from the analyses, resulting in a sample of 1,046 women ages 20–93 years available for analysis. The Barwon Health Human Research Ethics Committee approved the study, and written informed consent was obtained from all participants.



## Brief report

# Diet quality in bipolar disorder in a population-based sample of women

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## ABSTRACT

**Background:** Recent epidemiological evidence has indicated a role for diet quality in unipolar depressive illness. This study examined the association between diet quality and bipolar disorder (BD) in an epidemiological cohort of randomly selected, population-based women aged 20–93 years.

**Methods:** An a priori diet quality score was derived from food frequency questionnaire data, a factor analysis identified habitual dietary patterns and glycemic load was assessed. Mental health was assessed using the SCID-I/NP.

**Results:** BD was identified in 23 women and there were 691 participants with no history of psychopathology. Compared to those with no psychopathology, those with BD had a higher glycemic load ( $p=0.06$ ) and higher scores on a "western" dietary factor ( $p=0.03$ ) and the "modern" dietary factor ( $p=0.02$ ). For each standard deviation increase in a "western" and "modern" dietary pattern and glycemic load, the odds ratios for BD were increased ("western" OR=1.98, 95% CI 1.33–2.65; "modern" OR=1.72, 95% CI 1.14–2.39; GL OR=1.56, 95% CI 1.13–2.14). Conversely, a "traditional" dietary pattern was associated with reduced odds for BD (OR=0.53, 95% CI 0.32–0.89) after adjustments for overall energy intake.

**Limitations:** The small sample size did not allow for multivariate analyses and the cross-sectional study design precludes any determinations regarding the direction of the relationships between diet quality and BD.

**Conclusion:** These data are largely concordant with results from dietary studies in unipolar depression. However, clinical recommendations cannot be made until the direction of the relationship between diet quality and BD is determined. Longitudinal studies are warranted.

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## 1. Introduction

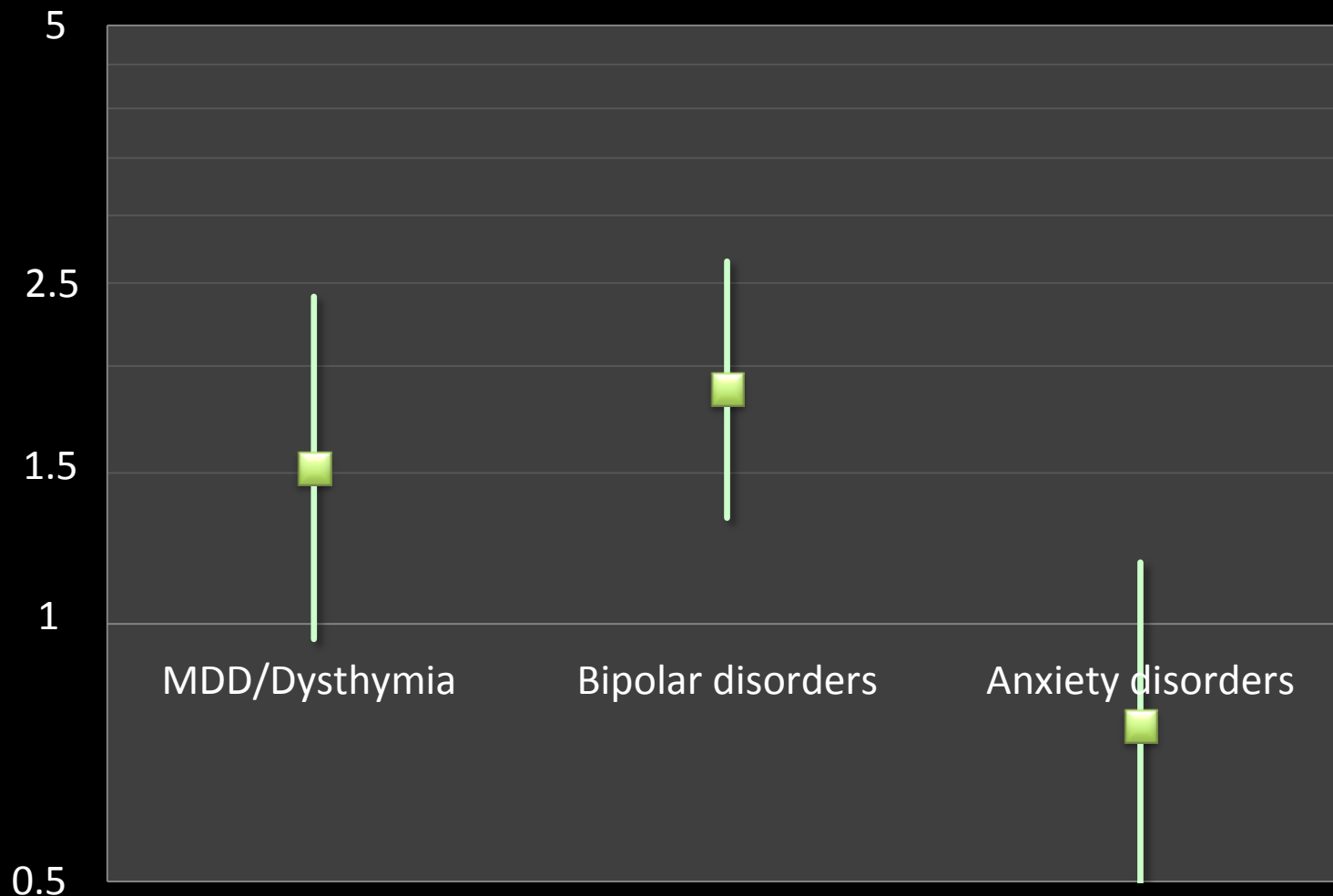
Recent epidemiological evidence from cross-sectional studies has identified inverse relationships between dietary quality and self-reported depressive symptoms and clinical disorders in

adults (Jacka et al., 2010b; Kuczmarski et al., 2010; Brydoun et al., 2010, 2009; Nari et al., 2010) and adolescents (Oddy et al., 2009; Jacka et al., 2010a), while two recent prospective studies suggest that diet quality may influence the risk for depressive illness over time (Sanchez-Villegas et al., 2009; Akbaraly et al., 2009). However, there are no equivalent studies in bipolar disorder (BD). Diet and nutrition have an impact on underlying biological factors that are implicated in depressive illness (Jacka and Berk, 2007), which may explain the recently identified associations between diet quality and the risk for depression. Many of these factors, such as systemic inflammation (Wade et al., 2002),

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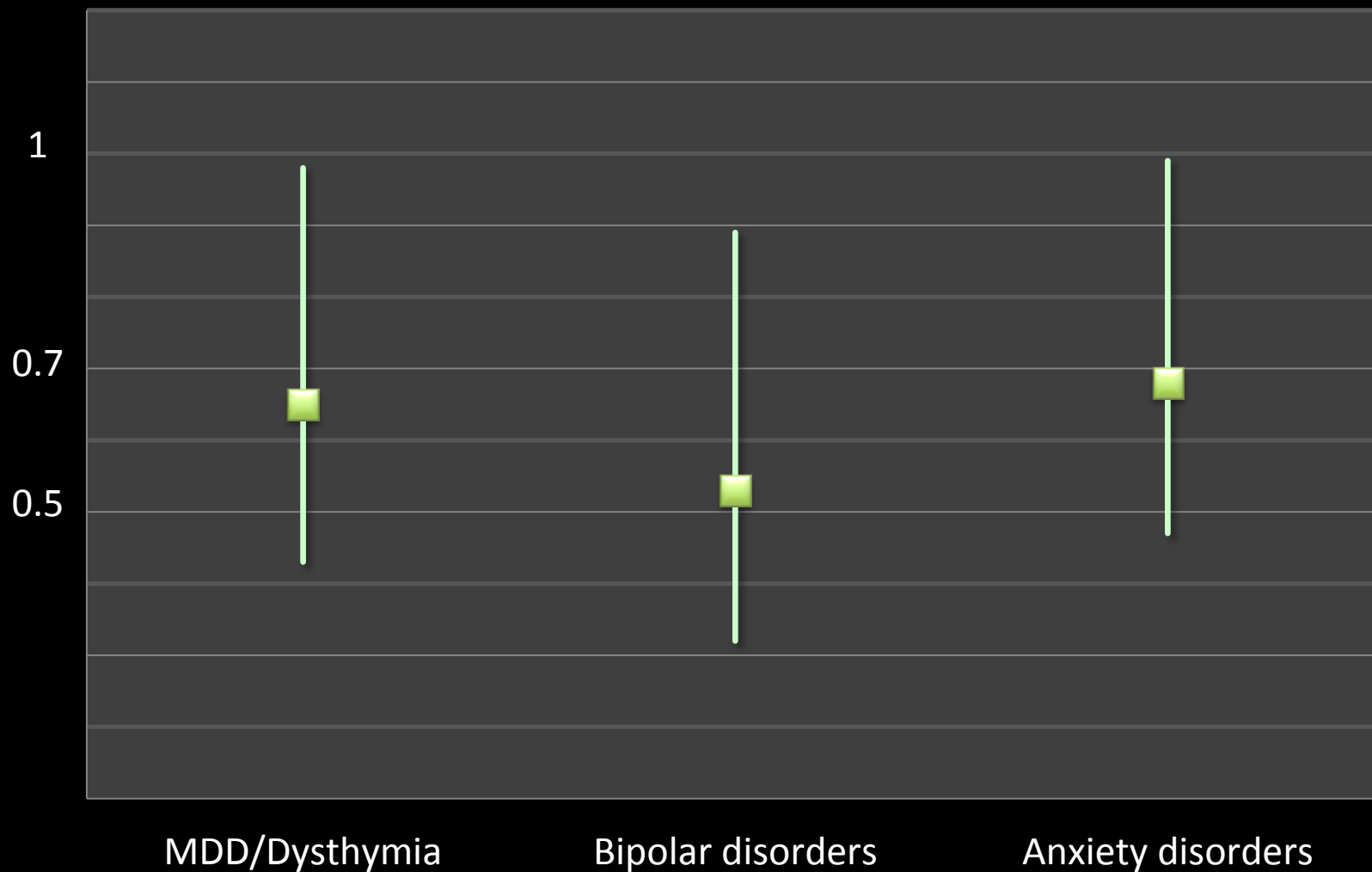
## 'WESTERN' DIETARY PATTERN (per SD)



Odds ratios and 95% confidence intervals

Western - junk and processed foods

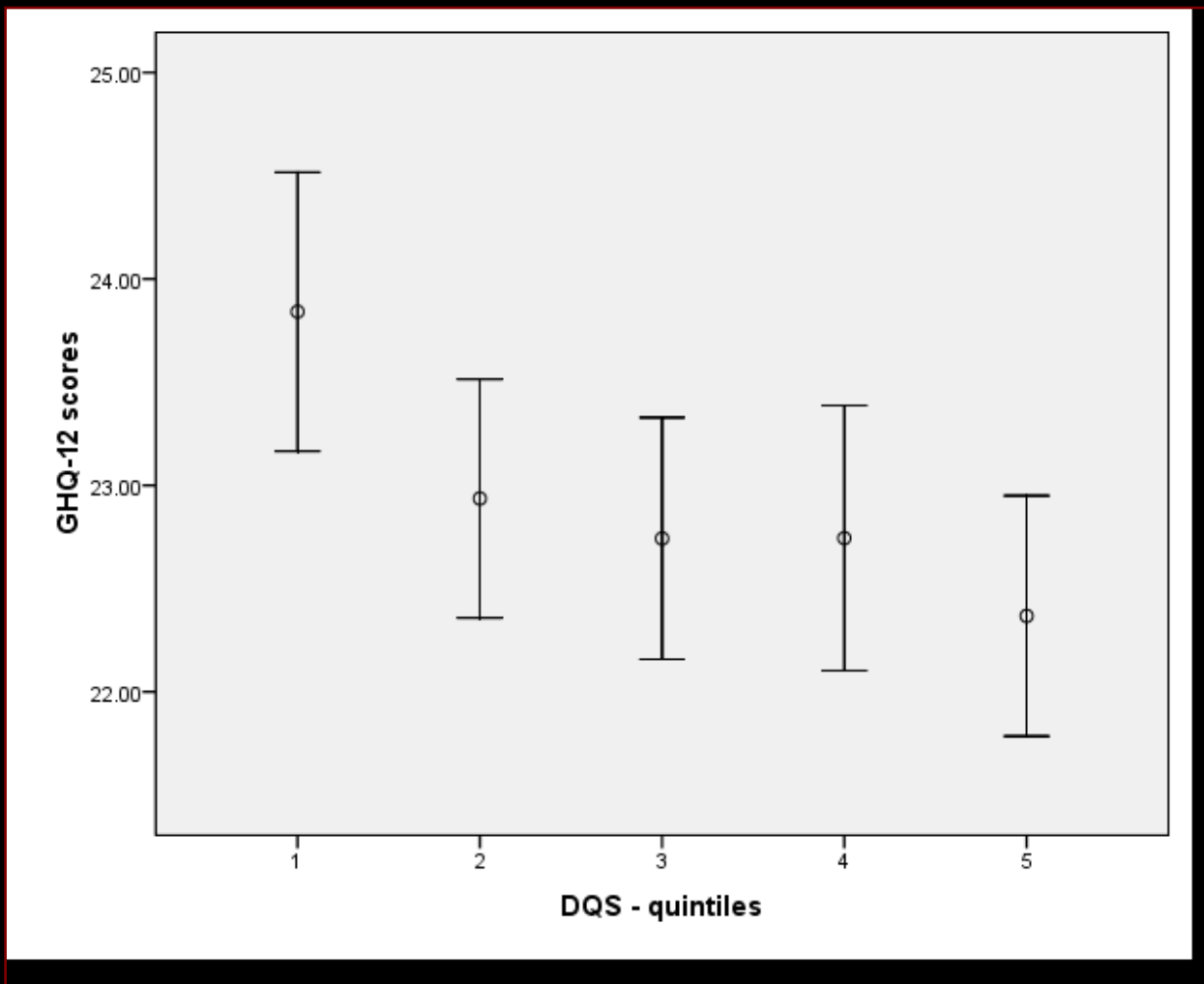
## 'TRADITIONAL' DIETARY PATTERN (per SD)



Odds ratios and 95% confidence intervals

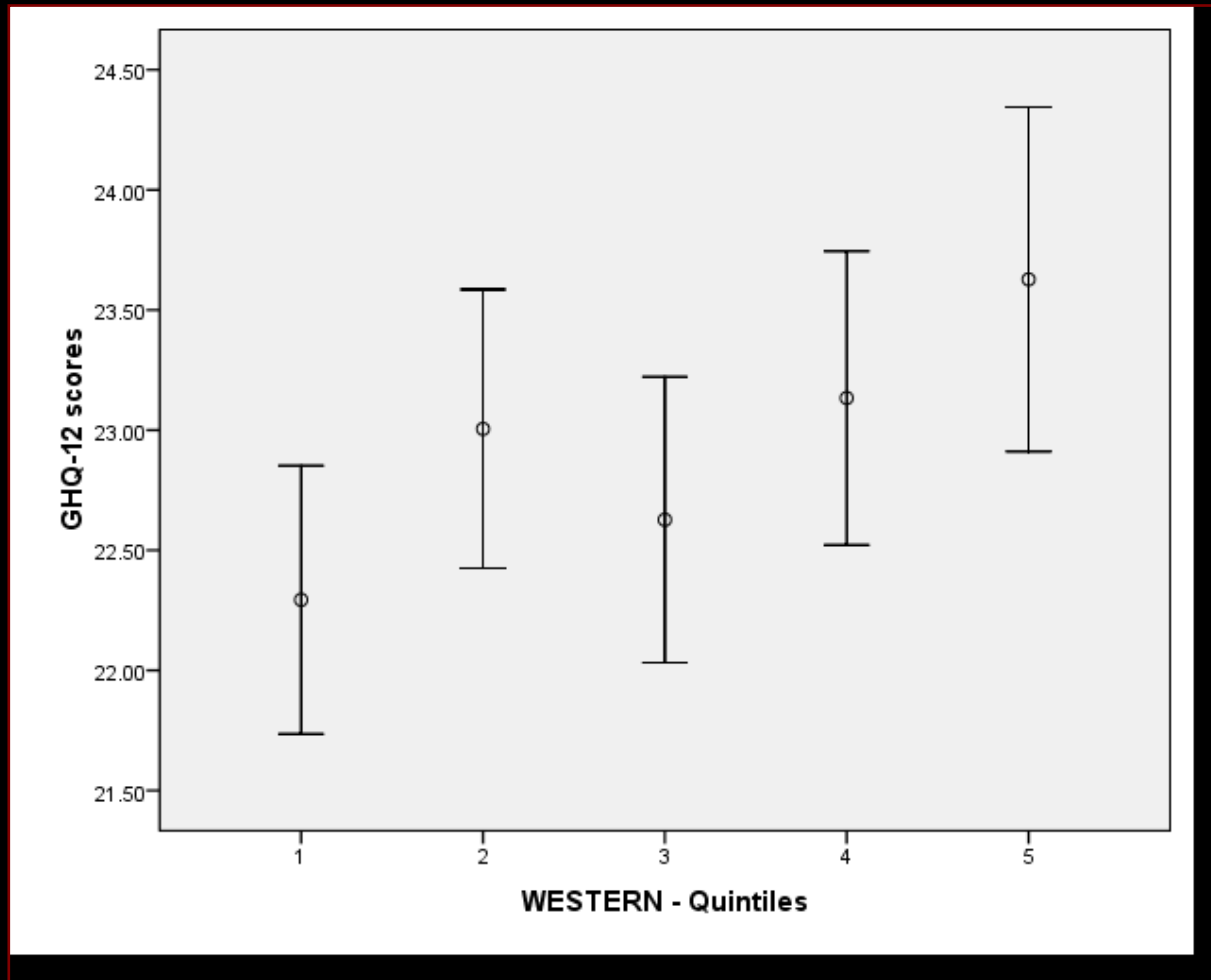
**Traditional = vegetables, fruit, beef, lamb, wholegrain, fish**

# DQS and GHQ-12 Scores



*Jacka et al. (Am J Psychiatry)*

## ‘Western diet’ and GHQ-12 Scores



*Jacka et al. (Am J Psychiatry)*

## Associations between diet quality and depressed mood in adolescents: results from the Australian Healthy Neighbourhoods Study

Felice N. Jacka, Peter J. Kremer, Eva R. Leslie, Michael Berk, George C. Patton, John W. Toumbourou, Joanne W. Williams

**Objective:** Adolescence frequently coincides with the onset of psychiatric illness and depression is commonly observed in adolescents. Recent data suggest a role for diet quality in adult depression. Given the importance of adequate nutrition for brain development, it is of interest to examine whether diet quality is also related to depression in adolescents.

**Methods:** The study examined 7114 adolescents, aged 10–14 years, who participated in the Australian Healthy Neighbourhoods Study. Healthy and unhealthy diet quality scores were derived from a dietary questionnaire. The Short Mood and Feelings Questionnaire for adolescents measured depression. Adjustments were made for age, gender, socioeconomic status, parental education, parental work status, family conflict, poor family management, dieting behaviours, body mass index, physical activity, and smoking.

**Results:** Compared to the lowest category of the healthy diet score, the adjusted odds ratios (95% confidence interval) for symptomatic depression across categories (C) was: C2 = 0.61 (0.45–0.84); C3 = 0.58 (0.43–0.79); C4 = 0.47 (0.35–0.64); and C5 = 0.55 (0.40–0.77). Compared to the lowest quintile, the adjusted odds ratios (95% confidence interval) for symptomatic depression across increasing quintiles of the unhealthy diet score were: Q2 = 1.03 (0.87–1.22); Q3 = 1.22 (1.03–1.44); Q4 = 1.29 (1.12–1.50); and Q5 = 1.79 (1.52–2.11).

**Conclusions:** Our results demonstrate an association between diet quality and adolescent depression that exists over and above the influence of socioeconomic, family, and other potential confounding factors.

**Key words:** adolescents, depression, diet, nutrition.

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Adolescence is a time of rapid physical, psychological, and social development. Unfortunately, this period frequently coincides with the onset of psychiatric illness; three-quarters of lifetime psychiatric disorders will first

emerge in adolescence or early adulthood [1]. Diet and nutrition modulate the pathophysiological factors underpinning depressive illness, and there are plausible reasons for examining the potential role of diet in

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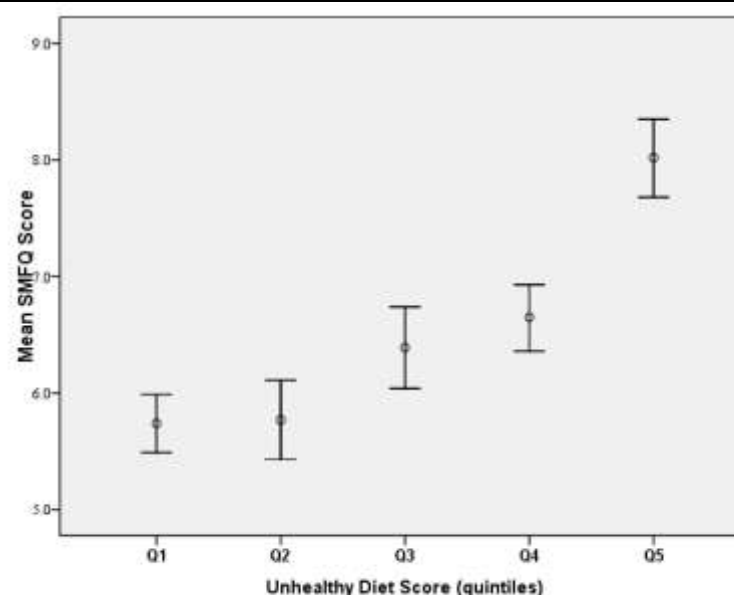
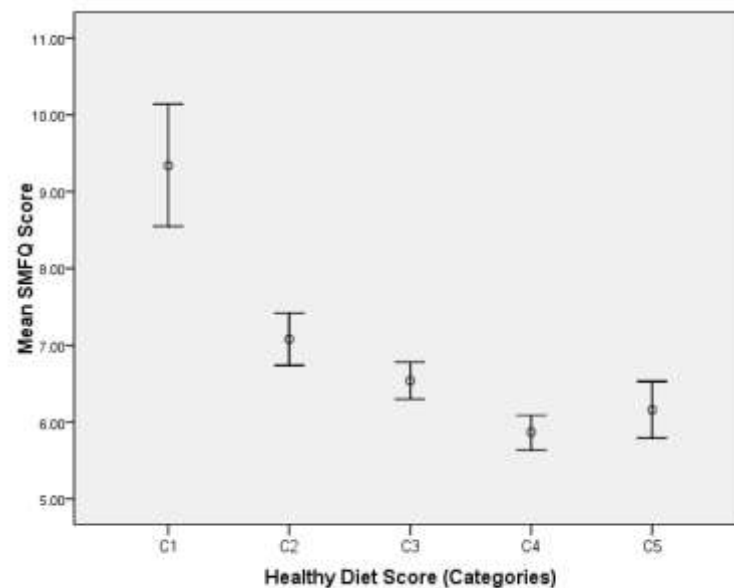
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**Age**

**Gender**

**Parental work status**

**Parental education level**

**SEIFA score (SES)**

**Family conflict**

**Poor family Management**

**Physical activity**

**Smoking**

**Adolescent dieting scale**



**Prospective**

# Association of the Mediterranean Dietary Pattern With the Incidence of Depression

*The Seguimiento Universidad de Navarra/University of Navarra Follow-up (SUN) Cohort*

Almudena Sánchez-Villegas, BPharm, PhD; Miguel Delgado-Rodríguez, MD, PhD, MPH; Alvaro Alonso, MD, PhD; Javier Schiaffino, MD, PhD; Francisco Latorre, BA, PhD; Lluís Serra-Majem, MD, PhD; Miguel Ángel Martínez-González, MD, PhD, MPH

**Context:** Adherence to the Mediterranean dietary pattern (MDP) is thought to reduce inflammatory, vascular, and metabolic processes that may be involved in the risk of clinical depression.

**Objective:** To assess the association between adherence to the MDP and the incidence of clinical depression.

**Design:** Prospective study that uses a validated 136-item food frequency questionnaire to assess adherence to the MDP. The MDP score positively weighted the consumption of vegetables, fruit and nuts, cereal, legumes, and fish; the monounsaturated- to saturated-fatty-acids ratio; and moderate alcohol consumption, whereas meat or meat products and whole-fat dairy were negatively weighted.

**Setting:** A dynamic cohort of university graduates (Seguimiento Universidad de Navarra/University of Navarra Follow-up [SUN] Project).

**Participants:** A total of 10 094 initially healthy Spanish participants from the SUN Project participated in the study. Recruitment began on December 21, 1999, and is ongoing.

**Main Outcome Measure:** Participants were classified as having incident depression if they were free of depression and antidepressant medication at baseline and reported a physician-made diagnosis of clinical depression and/or antidepressant medication use during follow-up.

**Results:** After a median follow-up of 4.4 years, 480 new cases of depression were identified. The multiple adjusted hazard ratios (95% confidence intervals) of depression for the 4 upper successive categories of adherence to the MDP (taking the category of lowest adherence as reference) were 0.74 (0.37-0.98), 0.66 (0.30-0.88), 0.49 (0.30-0.67), and 0.38 (0.44-0.77) ( $P$  for trend < .001). Inverse dose-response relationships were found for fruit and nuts, the monounsaturated- to saturated-fatty-acids ratio, and legumes.

**Conclusions:** Our results suggest a potential protective role of the MDP with regard to the prevention of depressive disorders; additional longitudinal studies and trials are needed to confirm these findings.

*Arch Gen Psychiatry.* 2009;66(10):1090-1098

UNIPOLAR MAJOR DEPRESSION is the leading cause of disability-adjusted years lost worldwide and the third leading cause of disability-adjusted years lost within developed countries.<sup>1</sup> Therefore, preventive strategies are needed to reduce its population impact and costs. Although the promotion of physical activity has been reported as an effective preventive measure,<sup>2</sup> scarce information exists with regard to other preventive strategies and specifically with regard to the role of diet in the prevention of this disorder.

In comparative studies,<sup>3</sup> the lifetime prevalence of mental disorders has been found to be lower in Mediterranean coun-

tries than in Northern European countries. Age-standardized suicide rates, which may indirectly reflect the prevalence of severe depression, tend also to be lowest in Mediterranean countries.<sup>4</sup> Therefore, without the exclusion of alternative explanations, it is plausible that the Mediterranean dietary pattern (MDP) may be protective against depression. A hallmark of the MDP is the abundant use of olive oil, which is rich in monounsaturated fatty acids (MUFAs). A beneficial effect of MUFA intake from olive oil with regard to depression has been hypothesized because such intake may improve the binding of serotonin to its receptors.<sup>5</sup> In fact, an inverse association between olive oil consumption and a 15-point geri-

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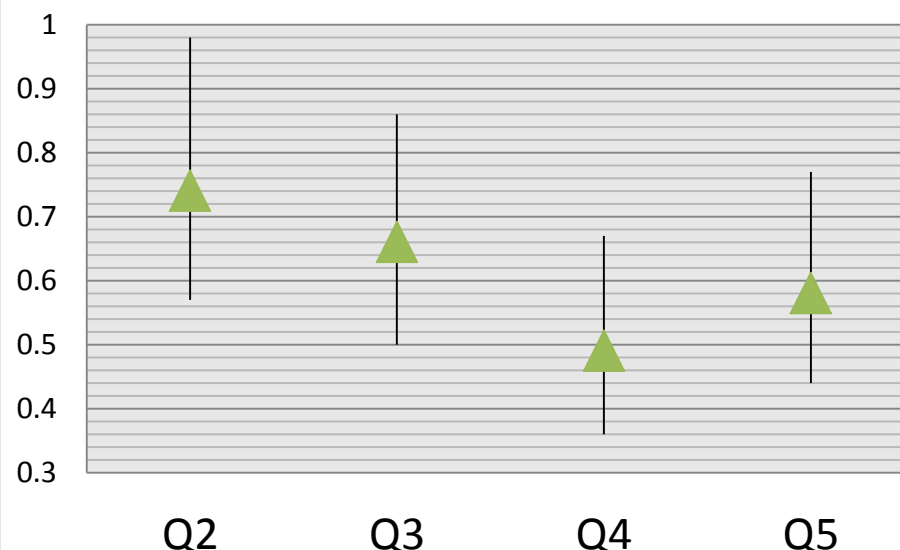
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## The SUN Cohort Study - Spain

n≈10,000

OR (95% CI) for incident depression according to quintiles of Mediterranean dietary adherence



Followed for ≈ 4.4 years

Outcome incident depression (DX or AD prescription)

## Dietary pattern and depressive symptoms in middle age

Tasnim N. Akbaraly, Eric J. Brunner, Jane E. Ferrie, Michael G. Marmot, Mika Kivimäki and Archana Singh-Manoux

### Background

Studies of diet and depression have focused primarily on individual nutrients.

### Aims

To examine the association between dietary patterns and depression using an overall diet approach.

### Method

Analyses were carried on data from 3486 participants (62.2% women, mean age 55.6 years) from the Whitehall II prospective cohort, in which two dietary patterns were identified: 'whole food' (heavily loaded by vegetables, fruits and fish) and 'processed food' (heavily loaded by sweetened desserts, fried food, processed meat, refined grains and high-fat dairy products). Self-reported depression was assessed 5 years

later using the Center for Epidemiologic Studies – Depression (CES-D) scale.

### Results

After adjusting for potential confounders, participants in the highest tertile of the whole food pattern had lower odds of CES-D depression (OR = 0.74, 95% CI 0.56–0.98) than those in the lowest tertile. In contrast, high consumption of processed food was associated with an increased odds of CES-D depression (OR = 1.58, 95% CI 1.15–2.23).

### Conclusions

In middle-aged participants, a processed food dietary pattern is a risk factor for CES-D depression 5 years later, whereas a whole food pattern is protective.

### Declaration of interest

None.

Research on the association between diet and depression has focused primarily on nutrients such as fatty acids,<sup>1–4</sup> and nutrients involved in the homocysteine pathway (such as vitamins B<sub>6</sub>, B<sub>9</sub> and B<sub>12</sub>)<sup>5–7</sup> with inconclusive results. Recent years have seen a move away from analysing associations between isolated nutrients and health to consideration of the effects of dietary patterns.<sup>8</sup> For example, a meta-analysis published in 2006 showed that greater adherence to a Mediterranean dietary pattern (high intake of fruits, vegetables and fish, and low intake of meat and dairy products) was associated with a lower incidence of Parkinson's and Alzheimer's diseases.<sup>9</sup> However, the health outcomes of that meta-analysis did not include depression and, to the best of our knowledge, no previous prospective study has investigated the association between dietary patterns and the occurrence of depressive symptoms. Thus, the objective of this study was to examine the association between dietary patterns, derived from a food frequency questionnaire using factor analysis, and depression in a large British middle-aged population, the Whitehall II study participants. We were able to control for a large range of sociodemographic variables, health behaviours and health parameters including chronic diseases and cognitive functioning.

### Method

The target population for the Whitehall II study was all London-based office staff, aged 35–55 years, working in 20 civil service departments.<sup>10</sup> Baseline screening (phase 1) took place during 1985–8 (n = 10 308), and involved a clinical examination and a self-administered questionnaire containing sections on demographic characteristics, health, lifestyle factors, work characteristics, social support and life events. The clinical examination included measures of blood pressure, anthropometric and biochemical factors, neuroendocrine function and subclinical markers of

cardiovascular disease. Subsequent phases of data collection alternated between postal questionnaire alone – phases 2 (1989–90), 4 (1995–6), 6 (2001) and 8 (2006) – and postal questionnaire accompanied by a clinical examination – phases 3 (1991–3), 5 (1997–9) and 7 (2002–4). Analyses reported in this study were restricted to the 3486 White European participants with data on dietary patterns and all covariates at phase 5 and depression at phase 7. Black (n = 175) and Asian (n = 331) participants were excluded owing to differences in eating patterns.

After complete description of the study to the participants, written informed consent was obtained; the University College London ethics committee approved the study.

### Dietary assessment at phase 5 and determination of dietary pattern

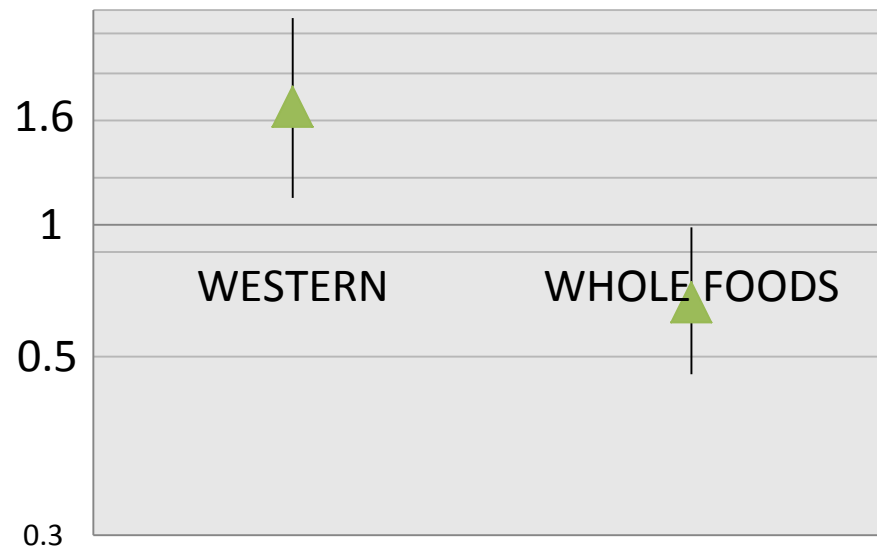
A machine-readable Food Frequency Questionnaire (FFQ),<sup>11</sup> based on the one used in the US Nurses Health Study,<sup>12</sup> was sent to the participants. The food list (127 items) from the original questionnaire was Anglicised, and foods commonly eaten in the UK were added.<sup>13</sup> A common unit or portion size for each food was specified, and participants were asked how often, on average, they had consumed that amount of the item during the previous year. Response to all items was on a nine-point scale, ranging from 'never, or less than once per month' to 'six or more times per day'. The selected frequency category for each food item was converted to a daily intake.

According to nutrient profile and culinary use of food items, the 127 items of the FFQ were grouped into 37 predefined food groups by adding food items within each group (online Table S6).<sup>14</sup> Dietary patterns were identified using principal component analysis of these 37 groups. The factors were rotated by an orthogonal transformation (varimax rotation function in SAS software to achieve a simple structure, allowing greater

## Whitehall II Cohort Study – UK

n ≈ 3500

### OR (95% CI) for incident depression



Followed for ≈ 5 years

Outcome incident depression (CES-D)

## A Prospective Study of Diet Quality and Mental Health in Adolescents

Felice N. Jacka<sup>1,2\*</sup>, Peter J. Kremer<sup>3</sup>, Michael Berk<sup>1,2,4,5</sup>, Andrea M. de Silva-Sanigorski<sup>6</sup>, Marjorie Moodie<sup>7</sup>, Eva R. Leslie<sup>8</sup>, Julie A. Pasco<sup>9</sup>, Boyd A. Swinburn<sup>9</sup>

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### Abstract

**Objectives:** A number of cross-sectional and prospective studies have now been published demonstrating inverse relationships between diet quality and the common mental disorders in adults. However, there are no existing prospective studies of this association in adolescents, the onset period of most disorders, limiting inferences regarding possible causal relationships.

**Methods:** In this study, 3040 Australian adolescents, aged 11–18 years at baseline, were measured in 2005–6 and 2007–8. Information on diet and mental health was collected by self-report and anthropometric data by trained researchers.

**Results:** There were cross-sectional, dose response relationships identified between measures of both healthy (positive) and unhealthy (inverse) diets and scores on the emotional subscale of the Pediatric Quality of Life Inventory (PedsQL), where higher scores mean better mental health, before and after adjustments for age, gender, socio-economic status, dieting behaviours, body mass index and physical activity. Higher healthy diet scores at baseline also predicted higher PedsQL scores at follow-up, while higher unhealthy diet scores at baseline predicted lower PedsQL scores at follow-up. Improvements in diet quality were mirrored by improvements in mental health over the follow-up period, while deteriorating diet quality was associated with poorer psychological functioning. Finally, results did not support the reverse causality hypothesis.

**Conclusion:** This study highlights the importance of diet in adolescence and its potential role in modifying mental health over the life course. Given that the majority of common mental health problems first manifest in adolescence, intervention studies are now required to test the effectiveness of preventing the common mental disorders through dietary modification.

**Citation:** Jacka FN, Kremer PJ, Berk M, de Silva-Sanigorski AM, Moodie M, et al. (2011) A Prospective Study of Diet Quality and Mental Health in Adolescents. PLoS ONE 6(9): e24805. doi:10.1371/journal.pone.0024805

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**Competing Interests:** The authors have declared that no competing interests exist.

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### Introduction

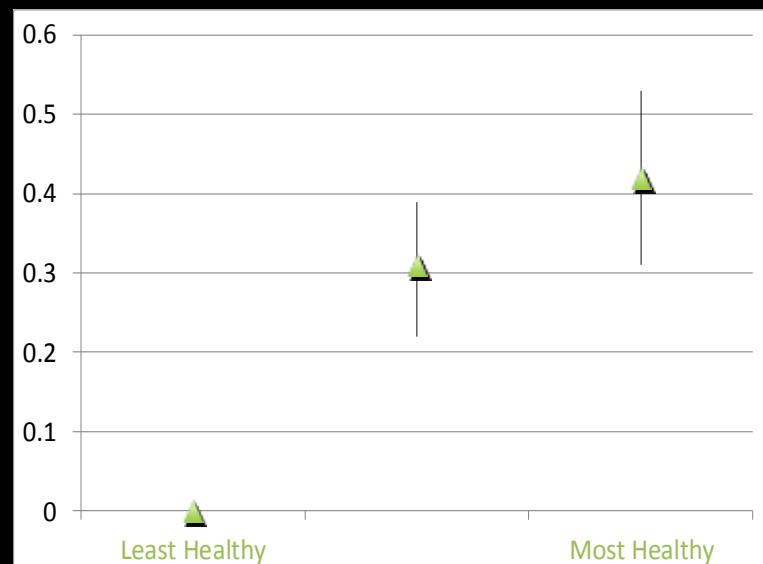
Three quarters of lifetime psychiatric disorder will emerge in adolescence or early adulthood [1]. The National Comorbidity Survey Replication recently reported that more than 22% of adolescents aged 13 to 18 yrs had already experienced a clinically significant mental health problem, with ages of onset ranging from 6 yrs for anxiety disorders, to 13 years for mood disorders [2]. In the last 18 months there have been a number of published studies identifying an inverse associations between diet quality and the common mental disorders, depression and anxiety, in adults [3,4,5] and two prospective studies suggesting that diet quality influences the risk for depressive illness in adults over time [6,7]. While two recent studies have also demonstrated cross-sectional associations between diet quality and emotional and behavioural

problems [8] and depression [9] in adolescents, there are no existing studies that examine this association in adolescents prospectively, limiting inferences regarding possible causal relationships. In this study we aimed to investigate relationships between measures of diet quality and adolescent mental health, both cross-sectionally and prospectively. We further aimed to examine the temporal relationships between diet quality and mental health and the associations between change in diet quality and change in psychological symptoms.

### Methods

#### Participants

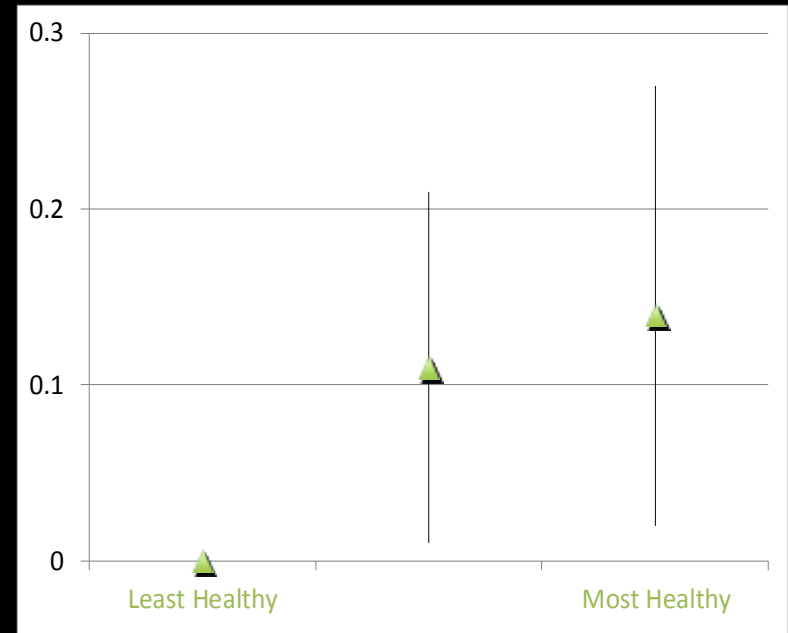
Data for these analyses were derived from the It's Your Move (IYM) project schools in the Barwon-South Western (BSW) region



## Unhealthy diet score



## Healthy diet score



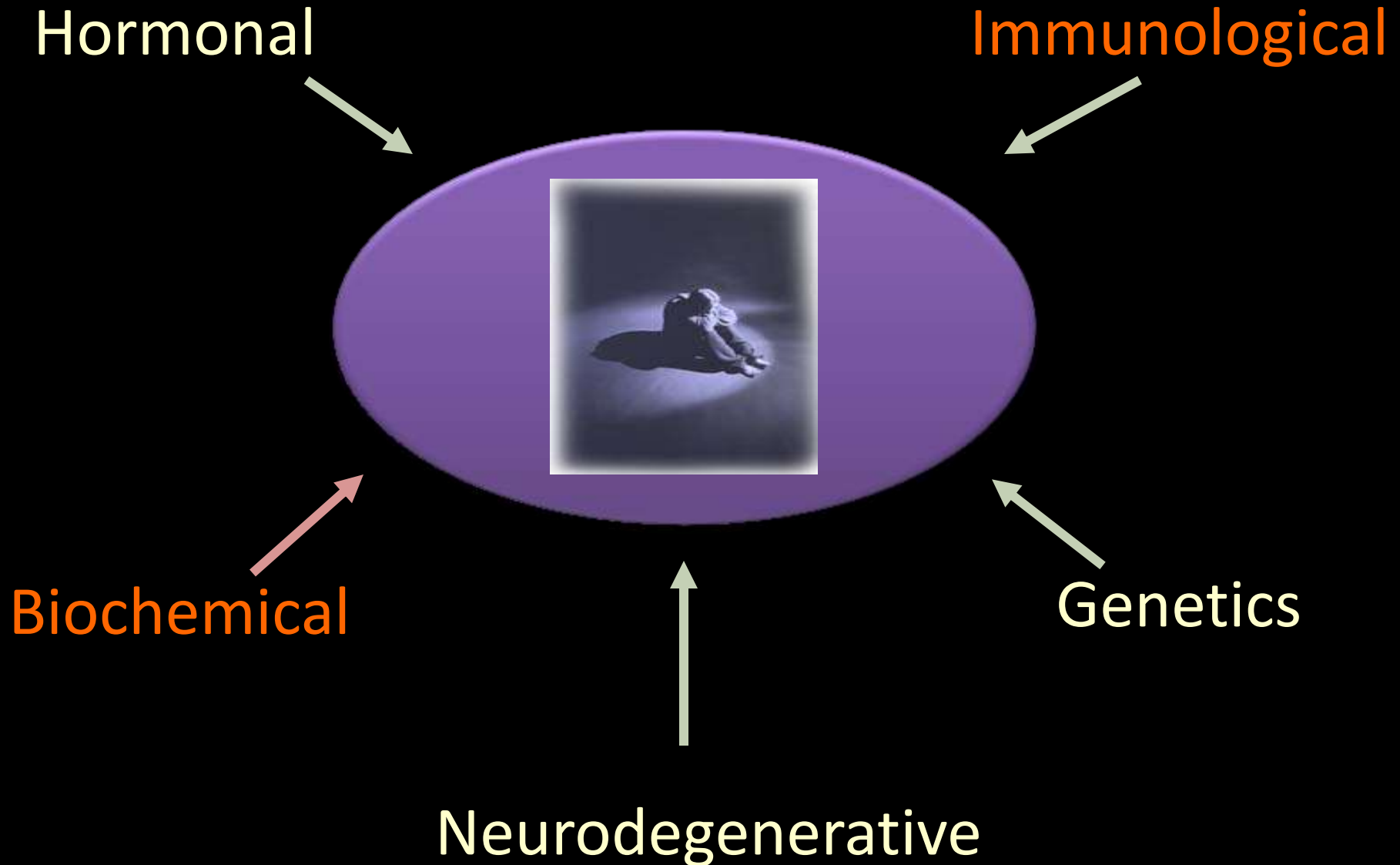
↑ Diet Quality = ↑ MH

↓ Diet Quality = ↓ MH

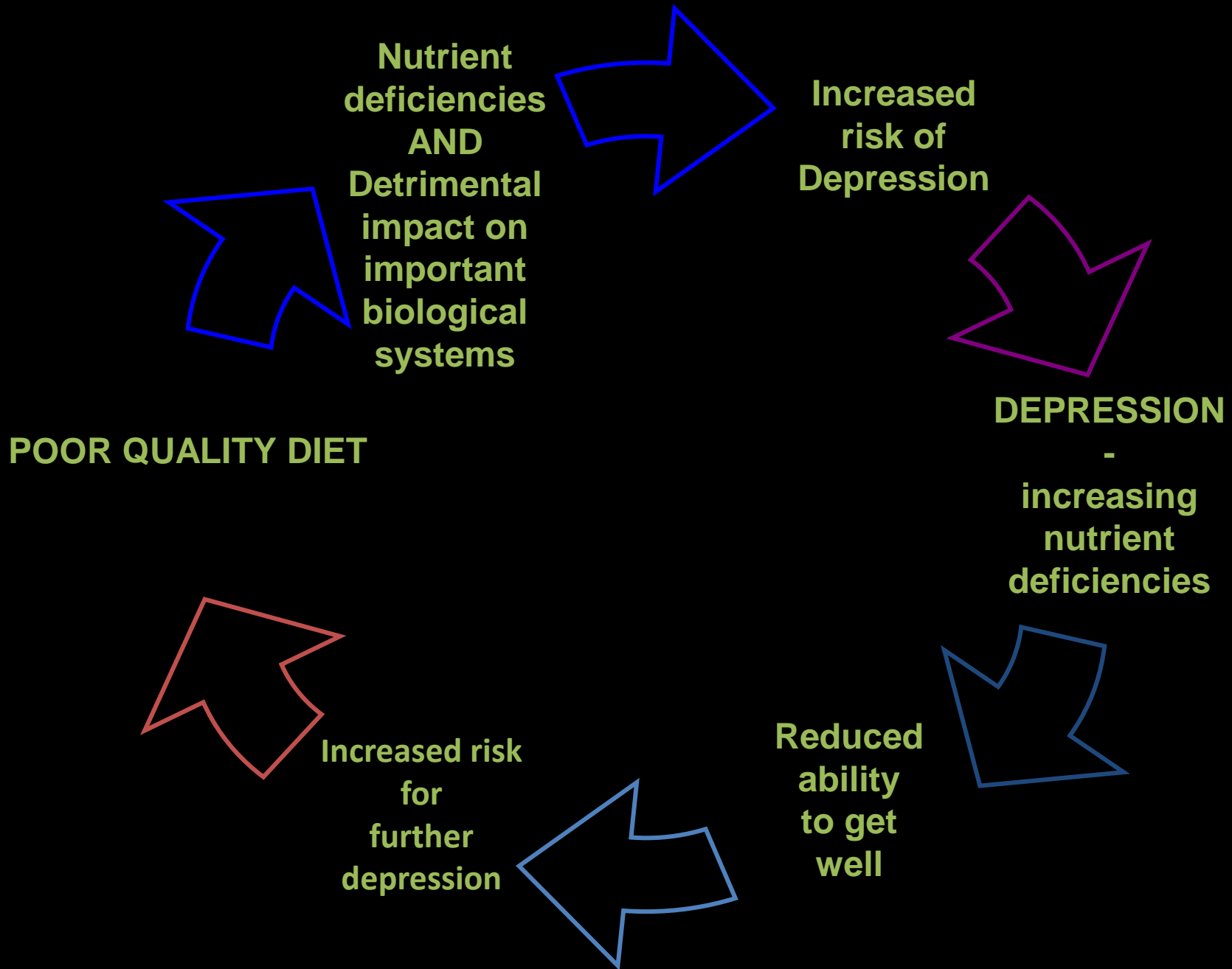
REVERSE CAUSALITY - NO

- ✓ Relationships between diet quality and mental health
- ✓ Adults and adolescents
- ✓ Different countries
- ✓ Different cultural settings
- ✓ Different measures of diet quality
- ✓ Different measures of mental health
- ✓ Do not appear to be explained by socioeconomic, medical and/or health behaviours
- ✓ Reverse causality does not seem to explain the relationships

**Mechanisms?**







***Lifecourse of depressive illness in the context of nutrition: A model of depletion***

CAVEAT



+



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*“It is both compelling and  
daunting to consider that  
dietary intervention at an  
individual or population  
level could reduce rates of  
psychiatric disorders.”*

AJP 2010



# From *Medscape Psychiatry & Mental Health* 2011

## •The Most Important Studies of 2010

**“Prevention is the Holy Grail of medicine.** In the past decade, prevention of mental illnesses has become a topic of vast interest and relevance in the field of psychiatry research....

.....Jacka and colleagues' results, although preliminary, are intriguing as **they suggest the potential for broad and basic prevention of high prevalence mental disorders like depression and anxiety**, with relevance for bipolar disorder and psychotic disorders in which both depression and anxiety are common”

***Thank you!!!***



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