

# **What is the association between improving diet and life satisfaction or wellbeing? And specifically what can we expect if someone who is currently eating an unhealthy diet succeeds in improving their diet?**

People with poor diets who improve their eating habits can expect modest but measurable gains in life satisfaction and wellbeing within weeks to months, though those already eating well may not see additional benefits.

## **Abstract**

Improving diet is associated with measurable gains in life satisfaction and overall wellbeing. Increased fruit and vegetable intake, adherence to Mediterranean, DASH, and plant-based diets, and improvements in general diet quality have been linked to modest increases in subjective happiness, higher SF-36 mental scores (e.g., = 0.75 for women; = 0.28 for men), and reduced depressive symptoms. In several studies, individuals with low baseline dietary quality experienced benefits within weeks to months after dietary changes. For example:

1. Increased fruit and vegetable consumption was associated with an approximate 0.24-point gain in life satisfaction.
2. Interventions focused on DGA-recommended vegetable intake yielded increases of +0.23 on the Subjective Happiness Scale.
3. Higher adherence to healthful plant-based diets correlated with incremental improvements on the SF-36 mental component.

Conversely, no significant changes were noted in populations with already high quality of life. These findings indicate that even modest dietary improvements can result in measurable enhancements in both mental and overall quality of life.

## **Paper search**

Using your research question "What is the association between improving diet and life satisfaction or wellbeing? And specifically what can we expect if someone who is currently eating an unhealthy diet succeeds in improving their diet?", we searched across over 126 million academic papers from the Semantic Scholar corpus. We retrieved the 497 papers most relevant to the query.

## **Screening**

We screened in papers that met these criteria:

- **Adult Population:** Were all study participants 18 years or older?
- **Dietary Change:** Did the study examine participants transitioning from a poor/unhealthy diet to an improved diet (either through intervention or natural change)?
- **Outcome Measures:** Did the study include quantitative measures of life satisfaction or wellbeing as primary outcomes?
- **Study Design:** Was the study design longitudinal (RCT, cohort study, or systematic review)?
- **Follow-up Duration:** Was the follow-up period at least 4 weeks in duration?

- **Medical Conditions:** Was the study conducted in a general population rather than focusing solely on specific medical conditions or eating disorders?
- **Intervention Isolation:** If dietary change was part of a broader intervention, were the effects of dietary change analyzed separately?
- **Temporal Design:** Was the study design something other than cross-sectional?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

## Data extraction

We asked a large language model to extract each data column below from each paper. We gave the model the extraction instructions shown below for each column.

- **Study Design:**

Identify the specific type of study design used. Look in the methods section for explicit description of the study design. Possible designs include:

- Randomized controlled trial
- Cohort study
- Before-and-after study
- Prospective longitudinal study

If multiple design elements are present, list all. If the design is not clearly stated, write "Design not clearly specified" and note where this uncertainty comes from in the text.

- **Participant Characteristics:**

Extract the following details about participants:

- Total sample size
- Gender breakdown (number/percentage of males and females)
- Mean age (and standard deviation if provided)
- Inclusion/exclusion criteria
- Baseline health or dietary status

If any of these details are missing, note "Not reported" for that specific characteristic. If ranges or multiple subgroups exist, include all relevant information.

- **Dietary Intervention Details:**

Describe the specific dietary intervention:

- Type of dietary change (e.g., low-fat, Mediterranean, increased fruit/vegetable intake)
- Duration of dietary intervention
- Specific dietary recommendations or guidelines provided
- Method of dietary assessment (e.g., food frequency questionnaire, dietary recall)

If multiple dietary approaches are used, describe each. If details are incomplete, specify which aspects are missing.

- **Well-being/Life Satisfaction Outcome Measures:**

Identify and extract:

- Specific well-being or life satisfaction measurement tools used (e.g., Warwick-Edinburgh Mental Well-being Scale)
- Timing of outcome measurements (baseline, post-intervention, follow-up)
- Specific well-being domains measured (e.g., mental health, quality of life, emotional state)
- Numerical results for well-being outcomes (means, changes, statistical significance)

If multiple outcome measures are used, list all. If results are presented in multiple ways, extract all relevant data.

- **Additional Health Outcomes:**

Extract any additional health-related outcomes measured alongside well-being:

- Physical health measures
- Physiological markers (e.g., cholesterol levels)
- Physical activity levels
- Dietary intake changes

Include numerical results, statistical significance, and measurement methods. If no additional outcomes were measured, write "No additional outcomes reported".

- **Study Duration and Follow-up:**

Extract:

- Total study duration
- Intervention period length
- Follow-up period length (if applicable)
- Number of follow-up time points

Specify the exact time periods in months or years. If follow-up periods differ between participants or groups, note these differences.

## Results

### Characteristics of Included Studies

Study	Study Design	Population Characteristics	Intervention Type	Duration	Full text retrieved
Mujcic and Oswald, 2016	Prospective longitudinal study	12,385 Australian adults; gender, age, inclusion/exclusion not reported	Increased fruit and vegetable consumption	Up to 24 months	No

Study	Study Design	Population Characteristics	Intervention Type	Duration	Full text retrieved
Ng et al., 2022	Prospective longitudinal study	2,844 adults (46% male, mean age 47.3)	Diet quality (Dietary Guideline Index, Mediterranean-DASH Intervention for Neurodegenerative Delay (MIND), Dietary Inflammatory Index (DII))	12 years	No
Mujcica and Oswald, 2016	Prospective longitudinal study	12,000 Australian adults; details not reported	Increased fruit and vegetable intake	~6 years	No
De Leon et al., 2021	Randomized Controlled Trial (RCT), before-and-after	75 adults, Body Mass Index (BMI) 25, low vegetable intake	Dietary Guidelines for Americans (DGA)-recommended vegetable intake	8 weeks	No
Caligiuri et al., 2012	Prospective longitudinal study	736 Canadian men, mean age 79.4/84.5	Observed food group consumption	5 years	No
Baden et al., 2020	Prospective longitudinal study	50,290 Nurses' Health Study (NHS) women (mean age 58), 51,784 NHSII women (mean age 39)	Plant-based diet indices (Plant-based Diet Index (PDI), healthful PDI (hPDI), unhealthful PDI (uPDI))	8 years	Yes
Leon et al., 2021	Randomized Controlled Trial (RCT)	Not reported; adults 18–65, BMI 25, low vegetable intake	DGA-recommended vegetable intake	8 weeks	No

Study	Study Design	Population Characteristics	Intervention Type	Duration	Full text retrieved
Bracci et al., "MedLey Study"	Randomized Controlled Trial (RCT), prospective longitudinal	152 Australians 65; high baseline Quality of Life (QoL)	Mediterranean diet	6 months	No
Kontogianni et al., 2020	Randomized Controlled Trial (RCT)	99, 53% male, mean age 54.9, mildly hypertensive	High vs. low polyphenol diet	8 weeks (plus 4-week washout)	Yes
Johnson et al., 2017	Before-and-after study	481 adults; details not reported	Healthy eating education, increased fruit and vegetable intake	12 weeks	No
Sutliffe et al., 2018	Before-and-after study	35 employees, 91% female, mean age 42.6	Micronutrient-dense, plant-rich diet	6 weeks	Yes
Bashan et al., 2018	Before-and-after study	129 (87% female), mean age 39.4	Healthy dietary habits	3 months	Yes
Hjort et al., 2023	Randomized Controlled Trial (RCT), before-and-after	161 adults, 53% female, mean age 56, metabolic syndrome	Low- vs. high-glycemic index (GI) Mediterranean diet	12 weeks	Yes
Ortolá et al., 2019	Prospective longitudinal, cohort	2,042 60 years; details not reported	Improved diet quality (Mediterranean Diet Adherence Screener (MEDAS), Mediterranean Diet Score (MDS), Alternative Healthy Eating Index (AHEI-2010))	~5 years	No
Agarwal et al., 2015	Quasi-experimental, before-and-after	292 (80% women), BMI 25 and/or Type 2 Diabetes (T2D)	Vegan diet	18 weeks	No

Study	Study Design	Population Characteristics	Intervention Type	Duration	Full text retrieved
Weidner et al., 1992	Cohort, before-and-after	305 (49% male), mean age 37.7	Low-fat, high complex-carbohydrate diet	5 years	No
Assaf et al., 2016a	Randomized Controlled Trial (RCT)	48,835 women, 50–79, high fat intake	Low-fat, increased fruit and vegetable/grains	1 year, up to 11.2 years	Yes
Zhou et al., 2022	Prospective longitudinal	12,316 Chinese adults 45–74	Dietary Approaches to Stop Hypertension (DASH) diet quality	~18 years	No
Ocean et al., 2018	Prospective longitudinal	Not reported; United Kingdom Household Longitudinal Study (UKHLS) sample	Increased fruit and vegetable consumption	Not reported in abstract	No
Kipfer et al., 2025	Randomized Controlled Trial (RCT)	125 nurses/social workers; details not reported	Finnish Nutrition Recommendations	6 months	No
Assaf et al., 2016b	Randomized Controlled Trial (RCT)	48,835 women, 50–79, high fat intake	Low-fat, increased fruit and vegetable/grains	Ongoing, up to 8 years	No
Pisinger et al., 2009	Cohort, Randomized Controlled Trial (RCT), prospective longitudinal	9,322; details not reported	Healthier diet, physical activity	7 years	No
Blank et al., 2007	Before-and-after, prospective longitudinal	10,419; details not reported	Increased fruit and vegetable intake, physical activity	2 years	No
Solomon-Moore et al., 2022	Prospective longitudinal	636 (78% female), adults United Kingdom	No specific intervention; healthy eating habits	12 months	Yes

Study	Study Design	Population Characteristics	Intervention Type	Duration	Full text retrieved
Grazia et al., 2022	Randomized Controlled Trial (RCT), before-and-after, prospective longitudinal	30 healthy, never competitive sports	Personalized diet	3 months	No

Study Design:

- Randomized Controlled Trials (RCTs):9 studies (including RCT, RCT before-and-after, and RCT prospective longitudinal)
- Prospective longitudinal or cohort studies:10 studies
- Before-and-after or quasi-experimental studies:6 studies
- Assignment of design:Where studies used more than one design, the most prominent design was used for classification.

Intervention Type:

- Increased fruit and vegetable intake:3 studies
- Mediterranean diet (including low/high-glycemic index variants):2 studies
- Plant-based, vegan, or vegetarian diets:3 studies
- Diet quality indices (such as DASH, MIND, AHEI, etc.):3 studies
- Low-fat/high-carbohydrate diets:3 studies
- Polyphenol-rich diets:1 study
- Healthy eating education or general healthy eating habits:3 studies
- National dietary guidelines (such as DGA or Finnish recommendations):3 studies
- Personalized diet interventions:1 study
- Multiple or combined interventions (e.g., diet plus physical activity):2 studies
- Other interventions:1 study

Duration:

- 3 months:8 studies
- >3 months to 6 months:4 studies
- >1 year to 5 years:5 studies
- >5 years:6 studies
- No duration information found:1 study

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## Effects of Dietary Improvement on Wellbeing

### Mental Health Outcomes

Study	Intervention	Mental Health Measure	Effect Size	Key Findings
Mujcic and Oswald, 2016	Increased fruit and vegetable intake	No mention found	Up to 0.24 life-satisfaction points	Increased fruit and vegetable intake predictive of increased happiness and life satisfaction, as reported in the abstract
Ng et al., 2022	Improved diet quality	Short Form-36 Mental Component Score (SF-36 MCS)	= 0.75 (women, MCS), = 0.28 (men, global MCS) Quality of Life	Positive changes in diet quality associated with improved mental health-related Quality of Life, especially in women, as reported in the abstract
Mujcica and Oswald, 2016	Increased fruit and vegetable intake	Happiness, life satisfaction	Up to 0.24 points	Increases in fruit and vegetable intake predictive of increased happiness and life satisfaction, as reported in the abstract
De Leon et al., 2021	DGA vegetable intake	Subjective Happiness Scale (SHS)	+0.23 ± 0.11	Significant increase in happiness in intervention group ( $P = .015$ ), as reported in the abstract
Caligiuri et al., 2012	Observed fruit and vegetable/grain intake	No mention found	No mention found	More food groups daily associated with better mental and physical scores, as reported in the abstract

Study	Intervention	Mental Health Measure	Effect Size	Key Findings
Baden et al., 2020	Plant-based diet	Short Form-36 Mental Component Score (SF-36 MCS)	0.09–0.11 per 10-point healthful Plant-based Diet Index (hPDI)	Increase in hPDI associated with improved mental health-related Quality of Life, as reported in the full text
Leon et al., 2021	DGA vegetable intake	Subjective Happiness Scale (SHS)	No mention found	Significant increase in happiness in intervention group ( $P < 0.001$ ), as reported in the abstract
Bracci et al., "MedLey Study"	Mediterranean diet	Short Form-36 Version 2 (SF-36V2)	No significant difference	No significant difference in Quality of Life between groups, as reported in the abstract
Kontogianni et al., 2020	High polyphenol diet	Beck Depression Inventory-II (BDI-II), Short Form-36 (SF-36)	BDI-II: $p=0.01$ , 66.6% reduction	High polyphenol diet group: reduced depressive symptoms, improved mental and physical health, as reported in the full text
Johnson et al., 2017	Healthy eating, fruit and vegetable intake	Warwick-Edinburgh Mental Wellbeing Scale	+5 median points	Significant, sustained improvement in mental wellbeing ( $P < 0.001$ ), as reported in the abstract
Sutcliffe et al., 2018	Plant-rich diet	Beck Depression Inventory-II (BDI-II), Quality of Life Index (QLI)	Significant	Improved sleep, Quality of Life, and depressive symptoms, as reported in the full text

Study	Intervention	Mental Health Measure	Effect Size	Key Findings
Bashan et al., 2018	Healthy diet	Short Form-36 (SF-36)	Significant	Overall improvement in Quality of Life, especially vitality and general health, as reported in the full text
Hjort et al., 2023	Low-glycemic index Mediterranean diet	Short Form-36 Version 2 (SF-36v2)	Role physical: 5.6 arbitrary units, Vitality: 6.9 arbitrary units	Significant improvements in low-glycemic index group ( $p=0.022$ , $p=0.008$ ), as reported in the full text
Ortolá et al., 2019	Improved diet quality	Deficit index	= -1.49 to -2.20	Improved diet associated with less functional deterioration, as reported in the abstract
Agarwal et al., 2015	Vegan diet	Short Form-36 (SF-36), Work Productivity and Activity Impairment (WPAI)	Depression ( $p=.02$ ), anxiety ( $p=.04$ )	Improved depression, anxiety, and productivity, as reported in the abstract
Weidner et al., 1992	Low-fat, high-carbohydrate diet	Symptom Checklist-90 (SCL-90)	Depression: 2.9 points, Hostility: 3.3 points	Improved depression and hostility ( $P=0.044$ , $0.035$ ), as reported in the abstract
Assaf et al., 2016a	Low-fat, increased fruit and vegetable/grains	RAND-36	Vitality: 1.9 units	Small but significant improvements in vitality and general health, as reported in the full text
Zhou et al., 2022	DASH diet	No mention found	Odds Ratio (OR) 1.19–2.08	Improved diet associated with higher odds of healthy ageing, as reported in the abstract

Study	Intervention	Mental Health Measure	Effect Size	Key Findings
Ocean et al., 2018	Increased fruit and vegetable intake	No mention found	No mention found	Dose-response improvement in subjective wellbeing, as reported in the abstract
Kipfer et al., 2025	Finnish guidelines	World Health Organization-8 Eurohis (WHO-8 Eurohis)	No mention found	Protocol only; outcomes not yet reported
Assaf et al., 2016b	Low-fat, increased fruit and vegetable/grains	RAND-36	General health: 1.7 units	Small but significant improvements in general health and vitality, as reported in the abstract
Pisinger et al., 2009	Healthier diet	Short Form-12 (SF-12)	Odds Ratio (OR) 1.68 (mental health)	Healthier diet at 5 years associated with improved mental health, as reported in the abstract
Blank et al., 2007	Fruit and vegetable intake, activity	No mention found	Mental health: 2.86, 2.71	Significant improvement in mental health ( $P < 0.01$ ), as reported in the abstract
Solomon-Moore et al., 2022	Healthy eating habits	Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS)	+1.28 mean score	Wellbeing increased over 12 months, as reported in the full text
Grazia et al., 2022	Personalized diet	No mention found	No mention found	Improved psycho-physical wellbeing (no numerical data), as reported in the abstract

Intervention Types:

- Increased fruit and vegetable intake: 6 studies

- Plant-based, vegan, or vegetarian interventions:3 studies
- Mediterranean diet interventions:2 studies
- General diet quality interventions (including DGA, DASH, low-fat, healthy eating, polyphenol, etc.):13 studies
- Personalized diet intervention:1 study

Mental Health Measures:

- Short Form-36 and variants (SF-36, SF-36v2, SF-12, RAND-36):10 studies
- Subjective Happiness Scale (SHS):2 studies
- Beck Depression Inventory-II (BDI-II):2 studies
- Other measures (Warwick-Edinburgh, Quality of Life Index, Work Productivity and Activity Impairment, Symptom Checklist-90, Short Warwick-Edinburgh Mental Wellbeing Scale, Deficit index, World Health Organization-8 Eurohis):1 study each
- No mention of a specific mental health measure found:6 studies
- Happiness/life satisfaction as a measure:1 study

Effect Size and Statistical Significance:

- Statistically significant positive effect reported:20 studies
- Null effect (no significant difference) reported:1 study
- No effect size or statistical significance information found:3 studies
- Protocol only, no outcomes yet reported:1 study

Direction of Effect:

- Positive association between dietary intervention and mental health/wellbeing reported:20 studies
- No significant difference reported:1 study
- No direction of effect information found:3 studies
- Protocol only:1 study

Adverse Effects:

- We did not find mention of adverse effects or harm from dietary improvement in the available abstracts or full texts.
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### **Life Satisfaction and Overall Wellbeing**

- Positive associations reported:Most studies measuring life satisfaction or overall wellbeing (including Mujcic and Oswald, 2016; De Leon et al., 2021; Baden et al., 2020; Assaf et al., 2016a/b) report positive associations with dietary improvement.
  - Domains of improvement:Improvements are often observed in both mental and physical domains of Quality of Life, as reported by these studies. The magnitude of change is typically modest.
  - Null findings:Some studies (such as Bracci et al., "MedLey Study") report no significant effect, particularly in populations with high baseline Quality of Life.
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## **Transition Effects**

- Impact of dietary change:Several studies specifically address the impact of moving from an unhealthy to a healthy diet.
    - Modest increases in fruit and vegetable intake:Mujcic and Oswald (2016) and Ocean et al. (2018) report that even modest increases can yield wellbeing improvements comparable to major positive life events, as reported in the abstracts.
    - Populations with unhealthy baseline diets:Studies targeting these populations (De Leon et al., 2021; Bashan et al., 2018; Agarwal et al., 2015) consistently report significant improvements in wellbeing and life satisfaction following dietary change, as reported in the abstracts.
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## **Thematic Analysis**

### **Immediate vs. Long-term Effects**

- Rapid onset of improvements:Several studies (Mujcic and Oswald, 2016; De Leon et al., 2021) report significant effects within weeks to months.
- Sustained or cumulative benefits:Longer-term studies (Ng et al., 2022; Baden et al., 2020; Zhou et al., 2022) demonstrate sustained or cumulative benefits over years.
- Detection of effects in high baseline populations:Some studies (Bracci et al., "MedLey Study") suggest that longer interventions or follow-up may be necessary to detect effects in populations with high baseline wellbeing.

### **Factors Influencing Success**

- Greater benefits in specific groups:Several studies note greater benefits in women (Ng et al., 2022), older adults (Baden et al., 2020), or those with lower baseline wellbeing.
- Moderators of effect:Intervention intensity, adherence, and baseline dietary status are important moderators, as reported by these studies.
- Null findings in high-functioning populations:Null findings are more common in studies with high-functioning or already healthy populations.

### **Quality of Life Dimensions**

- Consistent improvements:Improvements are most consistently observed in mental health, vitality, and subjective happiness domains.
- Physical health and functional domains:These also improve in some studies, particularly those with longer follow-up or more intensive interventions.
- Adverse effects:We did not find mention of adverse effects or harm from dietary improvement in the available abstracts or full texts.

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