

# Mental Health as a Public Health Issue: Mental Health and Nutrition

This list of journal articles focuses on the multi-faceted connections between mental health and nutrition. While many of the articles focus specifically on children, adolescents, and maternal-child dyads, others are broader population studies and research reviews. *This list is offered as a supplemental resource to the video located at [z.umn.edu/cmhpbh](http://z.umn.edu/cmhpbh).*

## The United States

**Citation:** Alaimo, K., Olson, C. M., & Frongillo, E. A. (2001). **Food insufficiency and American school-aged children's cognitive, academic, and psychosocial development.** *Pediatrics*, 108(1), 44-53.

**Link:** <http://pediatrics.aappublications.org/content/108/1/44.short>

**Summary:** This study looked at the relationships between food insufficiency and young people's (ages 6-16 years) academic, cognitive, and psychosocial outcomes. The data for analysis came from the Third National Health and Nutrition Examination Survey (NHANES III) and the analysis was done by two age groupings (6-11 and 12-16). Results indicated that children in both age groupings who experienced food insecurity had difficulties with school and getting along with peers. Six- to 11-year-olds were more likely to have seen a psychologist, had difficulty getting along with peers, to have significantly lower scores in arithmetic, and to have repeated a grade. Twelve- to 16-year-olds were more likely to have seen a psychologist, had difficulty getting along with peers, and been suspended from school. The authors conclude with a discussion of possible mechanisms in play in the connection between food insecurity and difficulties in school and psychosocial functioning. They believe that a key component of public policy should be to ensure families access to enough safe and nutritional food.

**Citation:** Casey, P., Goolsby, S., Berkowitz, C., Frank, D., Cook, J., Cutts, D., Black, M. M., Zaldivar, N., Levenson, S., Heeren, T., & Meyers, A. (2004). **Maternal depression, changing public assistance, food security, and child health status.** *Pediatrics*, 113(2), 298-304.  
doi:10.1542/peds.113.2.298

**Link:**

[https://www.researchgate.net/profile/Alan\\_Meyers/publication/8892889\\_Maternal\\_depression\\_changing\\_public\\_assistance\\_food\\_security\\_and\\_child\\_health\\_status/links/00b7d51d1cdad83793000000.pdf](https://www.researchgate.net/profile/Alan_Meyers/publication/8892889_Maternal_depression_changing_public_assistance_food_security_and_child_health_status/links/00b7d51d1cdad83793000000.pdf)

**Summary:** This study sought to examine the association of a positive maternal depression screening result with child health measures, reduction or loss of food stamps and welfare



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support, and household food insecurity. A convenience sample of 5306 mothers with children <36 months old. A positive maternal depression screen was associated with a fair/poor child health history, loss or reduction in food stamps and welfare support, household food insecurity, and a history of child hospitalization. After controlling for a number of other social-demographic factors, mothers with a positive depression screen were more likely to have lost food stamps (adjusted odds ratio [AOR]: 1.56), report more household food security (AOR: 2.69), and report a decrease in welfare support (AOR: 1.52) than mothers who did not have a positive depression screen.

**Citation:** Chocano-Bedoya, P. O., O'Reilly, E. J., Lucas, M., Mirzaei, F., Okereke, O. I., Fung, T. T., Hu, F. B., & Ascherio, A. (2013). **Prospective study on long-term dietary patterns and incident depression in middle-aged and older women.** *American Journal of Clinical Nutrition*, 98(3), 813-820. doi:10.3945/ajcn.112.052761

**Link:** <http://ajcn.nutrition.org/content/98/3/813.long>

**Summary:** The association between overall diet and depression was assessed in nurses in the US. This was a longitudinal study that required the participants to fill out food-frequency questionnaires every 4 years from 1986-2008. The diets of the participants were categorized as either "prudent" meaning it consisted mostly of vegetables or "western" indicated high consumption of meat. For mental health status, the researcher utilized two definitions: strict and broad. The strict definition was used for participants that had both a clinical diagnosis AND used antidepressants. The broad definition was used for participants that had one or the other. The researchers found that there was no relationship between type of diet and mental health status when they used the strict definition. When they used the broad definition they found that there was an increased risk of depression in the group of participants in the Western diet group, but after statistical adjustments they found the results to no longer be significant.

**Citation:** DiGirolamo, A. M., & Ramirez-Zea, M. (2009). **Role of zinc in maternal and child mental health.** *American Journal of Clinical Nutrition*, 89(3), 940S-945S. doi:10.3945/ajcn.2008.26692C

**Link:** <http://ajcn.nutrition.org/content/89/3/940S.full>

**Summary:** This article presents a review of existing literature addressing the relation between zinc and the mental health conditions of depression in women and attention-deficit hyperactivity (ADHD) in children. Reviewed literature spanned from 1975-2008 and included both human and animal research. The studies reviewed supported a link between low levels of zinc and the two mental health conditions focused on—especially for at-risk populations. The strongest support for use of zinc supplementation in treatment came from when it was combined with pharmacologic treatment. More research is needed on the causal pathways between mental health disorders and other factors.

**Citation:** Fulkerson, J. A., Sherwood, N. E., Perry, C. L., Neumark-Sztainer, D., & Story, M. (2004). **Depressive symptoms and adolescent eating and health behaviors: a multifaceted view in a population-based sample.** *Preventative Medicine*, 38(6), 865-875. doi:10.1016/j.ypmed.2003.12.028

**Link:**

[https://www.researchgate.net/profile/Nancy\\_Sherwood/publication/8513416\\_Depressive\\_symptoms\\_and\\_adolescent\\_eating\\_and\\_health\\_behaviors\\_A\\_multifaceted\\_view\\_in\\_a\\_population-based\\_sample/links/542ac7c00cf27e39fa90f149.pdf](https://www.researchgate.net/profile/Nancy_Sherwood/publication/8513416_Depressive_symptoms_and_adolescent_eating_and_health_behaviors_A_multifaceted_view_in_a_population-based_sample/links/542ac7c00cf27e39fa90f149.pdf)

**Summary/Description:** This study assessed the relationship between depressive symptoms and eating behaviors in adolescents. Middle and high school students were given surveys to determine their depressive symptoms (low, moderate, or high). The researchers then evaluated eating patterns and behaviors in each of the different groups. They found that depressive symptoms were correlated positively with health-compromising behaviors and

correlated negatively with health-promoting behaviors. Examples of health-compromising behaviors included weight concerns and perceived barriers and health-promoting behaviors included eating a regular breakfast, lunch, and dinner. Overall, in the population they studied they found that depressive symptoms were related to health-compromising eating behaviors.

**Citation:** Kleinman, R. E., Murphy, J. M., Little, M., Pagano, M., Wehler, C. A., Regal, K., & Jellinek, M. S. (1998). **Hunger in children in the United States: Potential behavioral and emotional correlates.** *Pediatrics*, 101(1), e3.

**Link:** <http://pediatrics.aappublications.org/content/101/1/e3.long>

**Summary/Description:** This study looked at the relationship between variables of psychosocial functioning in low-income children and hunger as defined by the Community Childhood Hunger Identification Project (CCHIP). The sample included 328 parents with a child(ren) under 12-years-old in Pittsburgh and surrounding Allegheny County. Parents completed the Pediatric Symptom Checklist and the CCHIP survey. Results indicated that low-income children defined as hungry on the CCHIP measure (in comparison to those defined as 'at-risk for hunger' or 'not hungry') were significantly more likely to have clinical levels of psychosocial dysfunction. Though almost all problems on the Pediatric Symptom Checklist were higher for hungry children, aggression and anxiety had the strongest association with the classification of hungry.

**Citation:** Kuczmarski, M. F., Cremer, A., Hotchkiss, L., Cotugna, N., Evans, M. K., & Zonderman, A. B. (2010). **Higher HEI-2005 scores associated with reduced symptoms of depression in an urban population: Findings from the Healthy Aging in Neighborhoods of Diversity across the Life Span.** *Journal of American Dietetic Association*, 110(3), 383-389.

doi:10.1016/j.jada.2009.11.025

**Link:** <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2850196/>

**Summary/Description:** This study was conducted in order to understand the association between diet and depressive symptoms in a low-income population. The participants were from the Healthy Aging in Neighborhoods of Diversity across the Life Span (HANDLS) study and included Caucasian and African American participants ranging from age 30-64. Dietary patterns were assessed via two 24-hour dietary recalls and depressive symptoms were evaluated via interviews using the CES-D scale. Upon analysis, the researchers found a positive correlation between dietary consumption and depression, but they found income to be a better predictor of depression in comparison.

**Citation:** Low Dog, T. (2010). **The role of nutrition in mental health.** *Alternative Therapies in Health and Medicine*, 16(2), 42-46.

**Link:** <http://search.proquest.com/openview/9e71cb27fe8f1134e75af1ceea886952/1?pq-origsite=gscholar>

**Summary/Description:** Noting that research has shown that pharmaceuticals are not always effective in treating more mild/moderate depression and anxiety disorders, the author reviews research on the connections between dietary patterns and mental health. In particular, research on the Mediterranean diet, low glycemic load diet, the connection between caffeine intake and anxiety, and different micronutrients (e.g., zinc, iron, omega-3 fatty acids). The article concludes with the suggestion that patients be informed about the relations between food and mood.

**Citation:** Ramakrishnan, U., Imhoff-Kunsch, B., & DiGirolamo, A. M. (2009). **Role of docosahexaenoic acid in maternal and child mental health.** *American Journal of Clinical Nutrition*, 89(3), 958S-962S. doi:10.3945/ajcn.2008.26692F

**Link:** <http://ajcn.nutrition.org/content/89/3/958S.full>

**Summary/Description:** This article reviewed existing research on the relationship between n-3 (omega-3) fatty acids and maternal and child mental health disorders. The studies reviewed

were all published in English and had human subjects. The authors found that those observational studies supported a direct association between low levels of n-3 fatty acids and higher risk for maternal depression and behavior disorders in children, small sample sizes and methodological weaknesses in intervention trials left weak evidence of supplementing n-3 for treatment benefit. They suggest that well-designed community-based trials to investigate efficacy for treatment are needed.

**Citation:** Selhub, E. M., Logan, A. C., & Bested, A. C. (2014). **Fermented foods, microbiota, and mental health: Ancient practice meets nutritional psychiatry.** *Journal of Physiological Anthropology*, 33(2). doi:10.1186/1880-6805-33-2

**Link:** <http://jphysiolanthropol.biomedcentral.com/articles/10.1186/1880-6805-33-2>

**Summary/Description:** The authors argue that eating fermented foods may be especially relevant to emerging research that links positive mental health to traditional dietary practices. They contend that the microbes in fermented foods may directly and indirectly influence brain health and that properly controlled fermentation likely amplifies the nutrient and phytochemical content of foods which may be associated with mental health. The authors review existing research in formulating their argument of the likely mental health benefits of eating properly fermented foods.

**Citation:** Shannon, S. (2009). **Integrative approaches to pediatric mood disorders.**

*Alternative Therapies in Health and Medicine*, 15(5), 48-53.

**Link:** [http://wholeness.com/Articles/Pediatric\\_Mood\\_Disorders.pdf](http://wholeness.com/Articles/Pediatric_Mood_Disorders.pdf)

**Summary/Description:** This article considers use of an integrative treatment approach with nutritional and botanical therapies to address pediatric mood disorders (depression and bipolar disorders). The author talks about approaches to holistic assessment, importance of lifestyle change, and important nutrients and botanicals for health.

**Citation:** Wachs, T. D. (2009). **Models linking nutritional deficiencies to maternal and child mental health.** *American Journal of Clinical Nutrition*, 89(3), 935S-939S. doi:10.3945/ajcn.2008.26692B

**Link:** <http://ajcn.nutrition.org/content/89/3/935S.full>

**Summary/Description:** This article presents four models for how nutritional deficiencies can translate into mental health problems. These models include the following: the multiple risks model; the cross-generational model; the attachment model; and the temperament model.

**Citation:** Walsh, R. (2011). **Lifestyle and mental health.** *American Psychologist*, 66(7), 579-592. doi:10.1037/a0021769

**Link:** <http://psycnet.apa.org/journals/amp/66/7/579/>

**Summary/Description:** This article asserts that professionals have vastly underestimated the significance of lifestyle for mental health. It reviews research on therapeutic lifestyle changes (TLCs), noting that they are sometimes as effective as pharmacotherapy or psychotherapy. TLCs overviewed include those that relate to exercise, nutrition and diet, nature, relationships, recreation and enjoyable activities, relaxation and stress management, religious and spiritual involvement, and contribution and service to others.

**Citation:** Weinreb, L., Wehler, C., Perloff, J., Scott, R., Hosmer, D., Sagor, L., & Gundersen, C. (2002). **Hunger: Its impact on children's health and mental health.** *Pediatrics*, 110(4), e41. doi:10.1542/peds.110.4.e41

**Link:** <http://pediatrics.aappublications.org/content/110/4/e41.short>

**Summary/Description:** This study focuses on the impact of child hunger, controlling for other factors that contribute to poor outcomes, on children's health and mental health. The sample was comprised of 180 preschool-aged children and 228 school-aged children and their mothers participating in a larger study of homelessness in female-headed households (all

participants were homeless or low-income/housed) in Worcester, Massachusetts. School-age children with severe hunger were more likely to have low birthweight (23% vs. 6%), be homeless (56% vs. 29%), have more stressful life events (9 vs. 6), and have higher parent-reported anxiety scores (2x as high) and chronic illness counts (3.4 vs. 1.8), and have higher levels of internalizing behavior problems than school-age children with no hunger. These elevated incidences were similar for the preschool-age group. For both children's age groups, mothers whose children experienced severe hunger were more likely to have a lifetime diagnosis of posttraumatic stress disorder (PTSD). Severe child hunger among school-aged children was associated with higher reported anxiety/depression after controlling for maternal distress, housing status, and stressful life events.

**Citation:** Whitaker, R. C., Phillips, S. M., & Orzol, S. M. (2006). **Food insecurity and the risks of depression and anxiety in mothers and behavior problems in their preschool-aged children.** *Pediatrics*, 118(3), e859-e868.

**Link:** <http://pediatrics.aappublications.org/content/118/3/e859.short>

**Summary/Description:** This study sought to find out whether maternal reports of food insecurity were correlated with higher incidences of depression and anxiety in mothers and higher incidences of behavior problems in their preschool-aged children. The sample came from a cross-sectional survey of 2870 mothers of three-year-olds who lived in 18 large cities in the US. After adjusting for a variety of sociodemographic and lifestyle factors, the percentage of mothers who reported depression or anxiety increased with decreasing food insecurity—16.9% in fully food secure households, 21.0% in marginally food secure households, and 30.3% in food insecure households. The incidence of children's behavior problems followed a similar pattern even after adjusting for maternal mental health—22.7% for those in fully food secure households, 31.1% for those in marginally food secure households, and 36.7% for those in food insecure households.

## AFRICA

**Citation:** Avan, B., Richter, L. M., Ramchandani, P. G., Norris, S. A., & Stein, A. (2010). **Maternal postnatal depression and children's growth and behaviour during the early years of life: Exploring the interaction between physical and mental health.** *Archives of Disease in Childhood*, 95(9), 690-695. doi:10.1136/adc.2009.164848

**Link:**

[https://www.researchgate.net/profile/Shane\\_Norris/publication/45366127\\_Maternal\\_postnatal\\_depression\\_and\\_children's\\_growth\\_and\\_behaviour\\_during\\_the\\_early\\_years\\_of\\_life\\_Exploring\\_the\\_interaction\\_between\\_physical\\_and\\_mental\\_health/links/00b495279fb9ec4209000000.pdf](https://www.researchgate.net/profile/Shane_Norris/publication/45366127_Maternal_postnatal_depression_and_children's_growth_and_behaviour_during_the_early_years_of_life_Exploring_the_interaction_between_physical_and_mental_health/links/00b495279fb9ec4209000000.pdf)

**Summary/Description:** This study sought to assess the association between maternal postnatal depression and child growth and behaviour problems at two years of age. The sample was part of a 'Birth to Twenty' longitudinal cohort study in Johannesburg, South Africa. Data was collected on mothers using the Pitt depression inventory at six months postpartum, and for two-year-old children using the Richman child behavior scale and measures of child growth. Results indicated that maternal depression was associated with child behaviour problems, children of depressed mothers were at increased risk for stunted growth, and that the association between maternal depression and child behavioural problems was significantly mediated by the child's stunted growth.

## ASIA

**Citation:** Kwon, S., Sung, S. J., & Ly, S. Y. (2010). **The interrelations among nutrition education, satisfaction with school lunch, school lunch leftovers and self-rated mental or physical health: The elementary school children in Daejeon area.** *Korean Journal of Community Nutrition*, 15(1), 94-107.

**Link:** <http://www.koreamed.org/SearchBasic.php?RID=0106KJCN/2010.15.1.94&DT=1>

**Summary/Description:** This study examined the interrelations among nutrition education and other factors—self-rated mental or physical health, satisfaction with school lunch, and school lunch leftovers. The sample was comprised of 623 fifth and sixth grade students, 59.2% of whom had received nutrition education. Findings included that when the students had a higher score on nutrition knowledge, the practical use of nutrition knowledge was higher and the score of self-rated mental health was more positive. When the practical use of nutrition knowledge was higher, both the score of self-rated mental health was higher and the scores of self-rated negative mental and physical health were lower. When the school lunch leftovers were less, both the self-rated positive mental health was significantly higher and the self-rated negative mental and physical health were significantly lower. The authors concluded that it is necessary to carry out nutrition education to maintain a positive health condition.

**Citation:** Rahman, A., Iqbal, Z., Bunn, J., Lovel, H., & Harrington, R. (2004). **Impact of maternal depression on infant nutritional status and illness: A cohort study.** *Archives of General Psychiatry*, 61(9), 946-952. doi:10.1001/archpsyc.61.9.946

**Link:** <http://archpsyc.jamanetwork.com/article.aspx?articleid=482059>

**Summary/Description:** This study used a prospective cohort design to investigate whether maternal depression was a risk factor for malnutrition and illness in Pakistani infants. The sample comprised 160 infants of depressed mothers and 160 infants of mothers who were not experiencing depression. Mothers who were depressed during the prenatal period had infants who had significantly more growth retardation at birth and 2-, 6-, and 12-month follow-ups. Chronic maternal depression carried greater risk for growth retardation in infants than episodic depression did. The authors urge that early detection of prenatal and postnatal maternal depression could benefit infants' physical health and development.

**Citation:** Rahman, A., Lovel, H., Bunn, J., Iqbal, Z., & Harrington, R. (2004). **Mothers' mental health and infant growth: A case-control study from Rawalpindi, Pakistan.** *Child: Care, Health and Development*, 30(1), 21-27. doi: 10.1111/j.1365-2214.2004.00382.x

**Link:** [http://hdrfoundation.org/docs/articles/Mothers\\_mental\\_health\\_and\\_infant\\_growth.pdf](http://hdrfoundation.org/docs/articles/Mothers_mental_health_and_infant_growth.pdf)

**Summary/Description:** This study looked at whether poor maternal mental health was associated with increased risk of undernutrition in infants. This was a case-control study with a sample of 172 infants and their mothers (82 undernourished infants and 90 matched controls). Data was collected on maternal distress and potential risk and protective factors. Maternal distress was significantly associated with an increased risk for infant undernutrition (odds ratio: 3.91) after controlling for birthweight and social factors. The authors suggest that early recognition and treatment of maternal mental health problems could help reduce mortality and morbidity rates in children.

## AUSTRALIA

**Citation:** Howard, A. L., Robinson, M., Smith, G. J., Ambrosini, G. L., Piek, J. P., & Oddy, W. H. (2011). **ADHD is associated with a “Western” dietary pattern in adolescents.** *Journal of Attention Disorders, 15*(5), 403-411. doi:10.1177/1087054710365990

**Link:** <http://jad.sagepub.com/content/15/5/403.short>

**Summary/Description:** This study looked at the relationship between ADHD and dietary patterns in adolescents. The sample came from the 14-year follow-up of the Raine Study, a large birth cohort study. In analysis, 115 of the 1799 adolescents had a diagnosis of ADHD and two primary dietary patterns emerged—“Western” (e.g., higher intakes of fat, refined sugar, and sodium) and “Healthy” (e.g., high levels of omega-3 fatty acids, folate, and fiber). Results indicated that ADHD was associated with a higher score on the “Western” dietary pattern and was not associated with the “Healthy” dietary pattern.

**Citation:** Jacka, F. N., Kremer, P., J., Berk, M., de Silva-Sanigorski, A. M., Moodle, M., Leslie, E. R., Pasco, J. A., & Swinburn, B. A. (2011). **A prospective study of diet quality and mental health in adolescents.** *PLoS ONE, 6*(9), e24805. doi:10.1371/journal.pone.0024805

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0024805>

**Summary/Description:** This study followed adolescents between the ages of 11-18 in Australia to understand the relationship between their dietary consumption and mental health. A survey was administered to the participants in order to gather information about their food choices and mental health status. Analysis of the data revealed that higher nutritional diet scores were positively correlated with higher scores on the mental health assessment suggesting better mental health status. On the contrary, lower nutritional diet scores were associated with lower scores on the mental health assessment. Additionally, the researchers found that those participants whose nutritional diet score improved at the follow-up also had improvements in their mental health status scores.

**Citation:** Jacka, F. N., Mykletun, A., & Berk, M. (2012). **Moving towards a population health approach to the primary prevention of common mental disorders.** *BMC Medicine, 10*(149). doi:10.1186/1741-7015-10-149

**Link:** <https://bmcmedicine.biomedcentral.com/articles/10.1186/1741-7015-10-149>

**Summary/Description:** This article reviews emerging data on lifestyle risk factors—particularly the quality of diet—in common mental disorders. The authors argue that anxiety and depression should be included among the high prevalence noncommunicable diseases influenced by lifestyle habits and should be handled preventatively on a universal scale.

**Citation:** Jacka, F. N., Pasco, J. A., Mykletun, A., Williams, L. J., Hodge, A. M., O’Reilly, S. L., Nicholson, G. C., Kotowicz, M. A., & Berk, M. (2010). **Association of Western and Traditional diets with depression and anxiety in women.** *American Journal of Psychiatry, 167*(3), 305-311. doi:10.1176/appi.ajp.2009.09060881

**Link:** <http://dro.deakin.edu.au/view/DU:30029149>

**Summary/Description:** In this study, the researchers tried to understand the relationship between western and traditional diets and mental health disorders, specifically depression and anxiety, in women ages 20-93. A “traditional” diet was defined as one with mostly fruits, vegetables, meat, and whole grains and a “western” diet as one with processed foods, sugary products, and refined grains. There were three main measures in this study: 1. A food frequency questionnaire to understand the dietary patterns of the participants, 2. A General Health Questionnaire to understand the psychological symptoms of the participants, and 3. A clinical interview to understand in depth and assess any depressive or anxiety disorders in the participants. The researchers found that traditional diets were associated with lower risk and western diets were associated with a higher risk of developing depressive and anxiety disorders.

**Citation:** Lai, J. S., Hiles, S., Bisquero, A., Hure, A. J., McEvoy, M., & Attia, J. (2014). A systematic review and meta-analysis of dietary patterns and depression in community-dwelling adults. *American Journal of Clinical Nutrition*, 99(1), 181-197. doi:10.3945/ajcn.113.069880

**Link:** <http://www.ncbi.nlm.nih.gov/pubmed/24196402>

**Summary/Description:** This article is a meta-analysis of studies that have evaluated the association between dietary patterns and mental health. The researchers pooled and assessed 21 studies. After analyzing the results of all the studies, they found that in general healthier dietary patterns were associated with a reduced risk of developing mental health disorders, particularly depression. From the studies that the researchers evaluated, there were not statistically significant associations between the “western diet” and its relation to depression. Overall, the researchers concluded that it seems the traditional diet is associated with a decreased risk of depression; however, they add that more research must be done to support this association.

**Citation:** Oddy, W. H., Kendall, G. E., Li, J., Jacoby, P., Robinson, M., de Klerk, N. H., Silburn, S. R., Zubrick, S. R., Landau, L. I., & Stanley, F. J. (2010). **The long-term effects of breastfeeding on child and adolescent mental health: A pregnancy cohort study followed for 14 years.** *The Journal of Pediatrics*, 156(4), 568-574. doi:10.1016/j.jpeds.2009.10.020

**Link:** <http://www.sciencedirect.com/science/article/pii/S0022347609010361>

**Summary/Description:** This study sought to determine if an independent effect of breastfeeding existed when it came to the mental health of children and adolescents. The sample came from the Western Australian Pregnancy Cohort (Raine). Results of Child Behaviour Checklist (CBCL) done at 2-, 6-, 8-, 10-, and 14-years of age informed child/adolescent mental health status with additional postnatal data on breastfeeding duration to be used in analysis. Results indicated more behavioral problems in young people who breastfed for a shorter duration (less than six months) when compared to young people who breastfed for a longer duration (six months or longer). The authors concluded that breastfeeding for a shorter duration may be a predictor for a developmental trajectory with adverse mental health outcomes.

**Citation:** Oddy, W. H., Robinson, M., Ambrosini, G. L., O’Sullivan, T. A., de Klerk, N. H., Beilin, L. J., Silburn, S. R., Zubrick, S. R., Stanley, F. J. (2009). **The association between dietary patterns and mental health in early adolescence.** *Preventative Medicine*, 49(1), 39-44. doi:10.1016/j.jpmed.2009.05.009

**Link:**

<http://wealthandhealth.ltd.uk/articles/The%20association%20between%20dietary%20patterns%20and%20mental%20health%20in%20early%20adolescence.pdf>

**Summary/Description:** This study considered possible associations between mental health and dietary patterns (“Western” or “Healthy”) of early adolescent youth. The sample was 14-year-olds born into the Western Australian Pregnancy Cohort(Raine) Study. Results from the Child Behaviour Checklist (CBCL) and a 212-item food frequency questionnaire were analyzed for each participant. Youth eating the Western diet (increased take-away foods, red meat, and confectionary) had higher internalizing, externalizing, and total behavioral scores on the CBCL. Improved scores on the CBCL were noted for youth who ate a healthier diet inclusive of more green leafy vegetables and fresh fruits.



**Citation:** O'Neill, A., Quirk, S. E., Houseden, S., Brennan, S. L., Williams, L. J., Pasco, J. A., Berk, M., Jacka, F. N. (2014). **The relationship between diet and mental health in children and adolescents: A systematic review.** *American Journal of Public Health, 104*(10), e31-e42. doi:10.2105/AJPH.2014.302110

**Link:** <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2014.302110>

**Summary/Description:** This is a meta-analysis that reviews 12 different studies conducted to explore the relationship between diet and mental health. After analysis on the findings of the studies, the researchers found a relationship an association between unhealthy food consumption and poor mental health in the populations of children and adolescents in the studies. In addition, they found that healthy food consumption was associated with better mental health.

**Citation:** O'Sullivan, T. A., Robinson, M., Kendall, G. E., Miller, M., Jacoby, P., Silburn, S. R., & Oddy, W. H. (2009). **A good-quality breakfast is associated with better mental health in adolescence.** *Public Health Nutrition, 12*(2), 249-258. doi:10.1017/S1368980008003935

**Link:**

<http://journals.cambridge.org/action/displayFulltext?type=6&fid=3432420&jid=PHN&volumeId=12&issueId=02&aid=3432416&bodyId=&membershipNumber=&societyETOCSession=&fulltextType=RA&fileId=S1368980008003935>

**Summary/Description:** This study sought to evaluate breakfast quality and its associations with mental health in an adolescent cohort. The sample came from the 14-year follow-up of the Raine Study, with 863 adolescents ages 13-15 years at time of follow-up. Data on breakfast habits came from food diaries and mental health status came from parent reporting using the Child Behavior Checklist (CBCL). Results related to consumption of five core food groups (breads and cereals, vegetables, fruit, dairy products, and meat/meat alternatives) for breakfast. The most common food groups consumed were dairy and breads and cereals. For each additional food group consumed during breakfast, the total mental health score on the CBCL decreased by 1.66 after adjusting for possible confounding factors (e.g., height, weight, maternal education, current family income, physical activity during leisure time). This finding showed a higher degree of mental health for adolescents eating from a higher number of core food groups during breakfast.

**Citation:** Parletta, N., Milte, C. M., & Meyer, B. J. (2013). **Nutritional modulation of cognitive function and mental health.** *The Journal of Nutritional Biochemistry, 24*(5), 725-743. doi:10.1016/j.jnutbio.2013.01.002

**Link:** <http://www.sciencedirect.com/science/article/pii/S095528631300020X>

**Summary/Description:** This article provides a model for ways that the Mediterranean-style diet can be beneficial to brain functioning. The authors look at the roles of specific food components/nutrients in the diet and how they help brain health-beneficial to both cognitive functioning and mental health. They call for further research on the synergistic properties of nutrients-with particular focus on those found in the Mediterranean-style diet-for both mental and cardiometabolic health.

## CANADA

**Citation:** Goldfield, G. S., Moore, C., Henderson, K., Buchholz, A., Obeid, N., & Flament, M. F. (2010). **Body dissatisfaction, dietary restraint, depression, and weight status in adolescents.** *Journal of School Health, 80*(4), 186-192. doi:10.1111/j.1746-1561.2009.00485.x

**Link:**

[https://www.researchgate.net/profile/Katherine\\_Henderson2/publication/43532725\\_Body\\_Dissatisfaction\\_Dietary\\_Restraint\\_Depression\\_and\\_Weight\\_Status\\_in\\_Adolescents/links/09e4150606896cd12e000000.pdf](https://www.researchgate.net/profile/Katherine_Henderson2/publication/43532725_Body_Dissatisfaction_Dietary_Restraint_Depression_and_Weight_Status_in_Adolescents/links/09e4150606896cd12e000000.pdf)

**Summary/Description:** This study looked at the impact of weight status (normal, overweight, obese) on youths' eating behavior, body image, and depressive symptoms. The survey sample was comprised of 1490 participants (907 females, 683 males) in 7th through 12th grade. Results indicated that youth who were obese were more likely to have higher scores on depression, significantly lower body satisfaction, and higher dietary restraint than their peers who were overweight or normal weight. There was not a significant difference between genders in the findings.

**Citation:** Leung, B. M. Y., & Kaplan, B. J. (2009). **Perinatal depression: Prevalence, risks, and the nutrition link—A review of the literature.** *Journal of the American Dietetic Association, 109*(9), 1566-1575. doi:10.1016/j.jada.2009.06.368

**Link:**

[https://www.researchgate.net/profile/Bonnie\\_Kaplan/publication/26760216\\_Perinatal\\_depression\\_prevalence\\_risks\\_and\\_the\\_nutrition\\_link\\_a\\_review\\_of\\_the\\_literature/links/0fcfd5148809a2a542000000.pdf](https://www.researchgate.net/profile/Bonnie_Kaplan/publication/26760216_Perinatal_depression_prevalence_risks_and_the_nutrition_link_a_review_of_the_literature/links/0fcfd5148809a2a542000000.pdf)

**Summary/Description:** This literature review examines the role of nutrition in perinatal depression (that which occurs during pregnancy and/or within the first year after delivery). The authors found that inadequate nutrition was one risk factor given increasing attention—in particular, they noted that deficiency in folate, vitamin B-12, calcium, iron, zinc, selenium, and n-3 fatty acids have been linked to mood. Of these, n-3 fatty acids have been studied most often as they directly relate to maternal depression—often finding a positive association between low levels of n-3 and higher incidence of depression. A typical western diet during pregnancy may lead to nutrient deficiencies, with a number of studies finding insufficient intakes of folate, n-3, B vitamins, iron, and calcium in pregnant women. The authors state that nutrient reserve depletion throughout pregnancy can increase risk for maternal depression.

**Citation:** McMartin, S. E., Jacka, F. N., & Colman, I. (2013). **The association between fruit and vegetable consumption and mental health disorders: Evidence from five waves of a national survey of Canadians.** *Preventative Medicine, 56*(3-4), 225-230.

doi:10.1016/j.ypmed.2012.12.016

**Link:** [https://minerva-](https://minerva-access.unimelb.edu.au/bitstream/handle/11343/41832/Association%20between%20fruit_Preview%20Medicine.pdf?sequence=1)

[access.unimelb.edu.au/bitstream/handle/11343/41832/Association%20between%20fruit\\_Preview%20Medicine.pdf?sequence=1](https://minerva-access.unimelb.edu.au/bitstream/handle/11343/41832/Association%20between%20fruit_Preview%20Medicine.pdf?sequence=1)

**Summary/Description:** This study was conducted in order to understand the relationship between consumption of fruits and vegetables and the incidence of mental health disorders. The researchers followed participants 12 years and older who completed the Canadian Community Health Survey (CCHS). The participants were assessed five times between 2000 and 2009. They found that increased consumption of fruits and vegetables was associated with a reduced risk of developing depression. This association was observed in each of the waves of testing. Additionally, previous diagnoses were negatively correlated with the amount of fruit and vegetable intake.

**Citation:** McMartin, S. E., Kuhle, S., Colman, I., Kirk, S. F. L., & Veugelers, P. J. (2011). **Diet quality and mental health in subsequent years among Canadian youth.** *Public Health Nutrition*, 15(12), 2253-2258. doi:10.1017/S1368980012000535

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0052615>

**Summary/Description:** This study examined the relationship between diet patterns and internalizing mental health disorders in 5th grade students. The dietary intake assessment included four subscales: variety, moderation, balance, and adequacy. The mental health status information was obtained by health records. After assessing the data, the researchers found no relationship between diet quality and internalizing mental health disorders in the 5th graders. They did find that those children that had a higher variety score on their dietary intake assessment had lower rates of internalizing behaviors later in life.

**Citation:** Melchior, M., Chastang, J. F., Falissard, B., Galera, C., Tremblay, R. E., Cote, S. M., & Boivin, M. (2012). **Food insecurity and children's mental health: A prospective birth cohort study.** *PloS One*, 7(12), e52615. doi:10.1371/journal.pone.0052615

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0052615>

**Summary/Description:** This study explored the potential predictive role of food insecurity in mental health problems. Data for analysis came from the Longitudinal Study of Child Development in Quebec (LSCDQ), which was a representative birth cohort of 2120 individuals. At ages 1½ and 4½ years, family food security status was obtained. At 4½, 5, 6, and 8 years children's mental health symptoms were assessed. Results indicated that 5.9% of the total sample experienced food insecurity and that a number of characteristics were associated with this status (e.g., immigrant status, family income, maternal and paternal depression). Children who experienced family food insecurity were more likely to have a consistently high number of depressive/anxious and hyperactive/inattentive symptoms when compared to their peers who had not experienced family food insecurity. After controlling for other family characteristics, the consistently high level of hyperactive/inattentive symptoms remained statistically significant. The authors conclude that reducing family food insecurity could help to decrease the number of mental health problems in school-age children.

**Citation:** Wakefield, S., Yeudall, F., Taron, C., Reynolds, J., & Skinner, A. (2007). **Growing urban health: Community gardening in south-east Toronto.** *Health Promotion International*, 22(2), 92-101. doi: 10.1093/heapro/dam001

**Link:** <http://heapro.oxfordjournals.org/content/22/2/92.short>

**Summary/Description:** This study presents results of a community-based research project on the perceived health impacts of community gardening. Multiple methods of data collection were used—participant observation, focus groups, and in-depth interviews. Gardeners perceived community gardens as having numerous health benefits, including better access to food, increased physical activity, better nutrition, and improved mental health. Challenges were also noted in relation to the community gardens such as the gardeners not owning the land and that the gardens were not perceived to be appreciated by decision makers. Further investigation in community gardens' benefits and potential is recommended.

## CENTRAL AND SOUTH AMERICA

**Citation:** DiGirolamo, A. M., Ramirez-Zea, M., Wang, M., Flores-Ayala, R., Martorell, R., Neufeld, L. M., Ramakrishnan, U., Sellen, D., Black, M. M., & Stein, A. (2010). **Randomized trial of the effect of zinc supplementation on the mental health of school-age children in Guatemala.** *American Journal of Clinical Nutrition*, 92(5), 1241-1250. doi:10.3945/ajcn.2010.29686

**Link:** <http://ajcn.nutrition.org/content/92/5/1241.short>

**Summary/Description:** This study examined the effect of zinc supplementation on school-age Guatemalan children's mental health. It was a six-month randomized, double-blind, controlled trial using zinc supplement and placebo conditions with 674 first through fourth

grade children. Outcome data on internalizing and externalizing behavior problems, positive behaviors, and serum zinc concentrations were collected. The results did not show significant behavioral differences between supplement and placebo conditions, though increases in serum zinc concentrations were associated with decreased internalizing behavioral symptoms.

**Citation:** Hassan, B. K., Werneck, G. L., & Hasselmann, M. H. (2016). Maternal mental health and nutritional status of six-month-old infants. *Revista de Saude Publica*, 50(7). doi:10.1590/S1518-8787.2016050006237

**Link:** [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0034-89102016000100206](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102016000100206)

**Summary/Description:** This study looked at whether maternal mental health was associated with the nutritional status of 6-month-old infants. The study sample included 228 infants and their mothers in Southeastern Brazil. They found that 39.9% of the mothers had common mental disorders, 23.7% had more severe mental disorders, and 8.3% had depression. Children of women with more severe mental disorders had, on average, lower weight-for-height measurements. Children of women with depression, on average, had both lower weight-for-height and weight-for-age measurements. The authors concluded that there is a positive relationship between poor maternal mental health and inadequate nutritional status for six-month-old infants.

## EUROPE

**Citation:** Akbaraly, T., Brunner, E., Ferrie, J., Marmot, M., Kivimaki, M., & Singh-Manoux, A. (2009). **Dietary patterns and depressive symptoms in middle age.** *The British Journal of Psychiatry*, 195(5), 408-413. doi:10.1192/bjp.bp.108.058925

**Link:**

[http://www.hal.inserm.fr/file/index/docid/432097/filename/Akbaraly\\_et\\_al\\_Diet\\_Depression\\_BJP.pdf](http://www.hal.inserm.fr/file/index/docid/432097/filename/Akbaraly_et_al_Diet_Depression_BJP.pdf)

**Summary/Description:** This study utilized an ‘overall diet approach’ to examine the association between diet and depression in middle-aged participants. The participants’ ‘whole food’ and ‘processed food’ consumption patterns were assessed. The CES-D scale was used to understand the depressive symptoms that were reported by the participants five years after the assessment of the dietary patterns. The researchers found that those with higher percentages of whole food consumption had lower risk of depression than those with a higher consumption of processed food.

**Citation:** Akbaraly, T. N., Sabia, S., Shipley, M. J., Batty, G. D., & Kivimaki, M. (2013). **Adherence to health dietary guidelines and future depressive symptoms: evidence for sex differentials in the Whitehall II study.** *The American Journal of Clinical Nutrition*, 97(2), 419-427. doi:10.3945/ajcn.112.041582

**Link:** <http://ajcn.nutrition.org/content/97/2/419.short>

**Summary/Description:** This study followed a subset of participants from the Whitehall II study which included men and women between the ages of 35-55 from the UK. The researcher sought to understand the relationship between diet and depressive symptoms. The extent to which participants followed recommended dietary guidelines was determined by the Alternative Healthy Eating Index (AHEI) and depressive symptomatology was based on Center for Epidemiologic Studies Depression Scale. The researchers found a negative correlation between the AHEI score and the observed depressive symptoms in the female participants. There was no significant association between the AHEI score and depressive symptoms in the male participants. The female participants who were able to increase their AHEI scores during the span of the study were less likely to have recurrent depressive symptoms at the end of the study.

**Citation:** Jacka, F. N., Mykletun, A., Berk, M., Bjelland, I., & Tell, G. S. (2011). **The association between habitual diet quality and the common mental disorders in community-dwelling adults: The Hordaland health study.** *Psychosomatic Medicine*, 73(6), 483-490.

doi:10.1097/PSY.0b013e318222831a

**Link:**

[https://www.researchgate.net/profile/Grethe\\_Tell/publication/51453886\\_The\\_Association\\_Between\\_Habitual\\_Diet\\_Quality\\_and\\_the\\_Common\\_Mental\\_Disorders\\_in\\_Community-Dwelling\\_Adults\\_The\\_Hordaland\\_Health\\_Study/links/548806f40cf289302e2ee904.pdf](https://www.researchgate.net/profile/Grethe_Tell/publication/51453886_The_Association_Between_Habitual_Diet_Quality_and_the_Common_Mental_Disorders_in_Community-Dwelling_Adults_The_Hordaland_Health_Study/links/548806f40cf289302e2ee904.pdf)

**Summary/Description:** In this study, the researchers sought to analyze the relationship between dietary consumption and the prevalence of mental health disorders in a population of Norwegian adults. Dietary consumption was assessed via a food frequency questionnaire and the Hospital Anxiety and Depression scale was used to assess the mental health status of the participants. The researchers found that higher dietary scores (indicating a healthier diet) were associated with reduced anxiety and depression in women and depression in men. Female participants who followed a Norwegian diet displayed lower rates of depression and male participants following this diet showed lower rates of anxiety. On the other hand, a Western diet was associated with increased anxiety in both men and women.

**Citation:** Jacka, F. N., Rothon, C., Taylor, S., Berk, M., & Stansfeld, S. A. (2013). **Diet quality and mental health problems in adolescents from East London: A prospective study.** *Social Psychiatry and Psychiatric Epidemiology*, 48(8), 1297-1306.

**Link:** <http://link.springer.com/article/10.1007/s00127-012-0623-5>

**Summary/Description:** This study looking into the relationship between quality of adolescent diet and depression in a culturally and ethnically diverse sample. It was a prospective cohort study with a sample of 2,093 adolescents who completed surveys at both time-points (ages 11-14 years). Data was collected using surveys: information about diet was collected using questions from the Health and Behaviours of Teenagers Study (HABITS), information about depression was collected using the Short Moods and Feelings Questionnaire (SMFQ), information on distress was collected using the Strengths and Difficulties Questionnaire (SDQ), and additional questions were asked about possible confounding factors (e.g., general health, smoking, BMI, parental conflict). Results indicated that unhealthy diet scores were positively related to behavioral scores indicating both more depressive symptoms and a greater level of distress. The authors concluded that their findings were consistent with prior observational studies, though they encourage continued research to confirm the causal relationship between diet and depression.

**Citation:** Jacka, F. N., Ystrom, E., Brantsaeter, A. L., Karevold, E., Roth, C., Haugen, M., Meltzer, H. M., Schjolberg, S., & Berk, M. (2013). **Maternal and early postnatal nutrition and mental health of offspring by age 5 years: A prospective cohort study.** *Journal of the American Academy of Child & Adolescent Psychiatry*, 52(10), 1038-1047. doi:10.1016/j.jaac.2013.07.002

**Link:** <http://www.sciencedirect.com/science/article/pii/S0890856713004498>

**Summary/Description:** This study sought to explore the possible impact of maternal and early postnatal nutrition on young children's later mental health. The sample data came from the prospective Norwegian Mother and Child Cohort Study (23,020 women and children), of which dietary classification of "healthy" or "unhealthy" was included. Study authors found that externalizing problems in children was predicted by higher intakes of unhealthy food prenatally, independent of other potential confounding factors. Higher levels of externalizing and internalizing behaviors were associated with both children having a high level of unhealthy diet postnatally and children having a low level of healthy diet postnatally.

**Citation:** Le Port, A., Gueguen, A., Kesse-Guyot, E., Melchior, M., Lemogne, C., Nabi, H., Goldberg, M., Zins, M., & Czernichow, S. (2012). **Association between dietary patterns and depressive symptoms over time: A 10-year follow-up study of the GAZEL cohort.** *PLoS ONE*, 7(12), e51593. doi:10.1371/journal.pone.0051593

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0051593>

**Summary/Description:** In this study, workers from France's national Gas and Electricity Company were assessed to understand the relationship between dietary consumption and symptoms of depression. The participants were asked to complete a questionnaire about their dietary consumption. In addition, they were required to complete a questionnaire about their behaviors (multiple times in the span of the 10 year follow-up period) so their depressive symptoms could be assessed. Upon analysis, the researchers found that those male participants that consumed high snack, high fat-sweet, and western diets were more likely to display depressive symptoms. The female participants that reported consuming low-fat, high snack diets were more likely to display symptoms of depression. Additionally, the found that those who consumed a mostly traditional diet had a lower likelihood of displaying depressive symptoms.

**Citation:** Lien, L. (2006). **Is breakfast consumption related to mental distress and academic performance in adolescents?** *Public Health Nutrition*, 10(4), 422-428.

**Link:**

[https://www.researchgate.net/profile/Lars\\_Lien/publication/6443762\\_Is\\_breakfast\\_eating\\_related\\_to\\_mental\\_distress\\_and\\_academic\\_performance\\_in\\_adolescents/links/0fcfd50a4916024e84000000.pdf](https://www.researchgate.net/profile/Lars_Lien/publication/6443762_Is_breakfast_eating_related_to_mental_distress_and_academic_performance_in_adolescents/links/0fcfd50a4916024e84000000.pdf)

**Summary/Description:** This study sought to examine the relationship between eating breakfast regularly, mental distress, and academic performance across immigration status and gender. The sample was comprised of 7343 tenth grade (15-16 year old) students in Oslo, Norway. The researchers found that all non-Western immigrant groups skipped breakfast more frequently than Norwegian students did, and overall girls skipped the meal more than boys did (27% vs. 19%). When comparing those who ate breakfast seldom/never to those who ate it every day—after adjusting for possible confounding factors—they found the odds ratio for being mentally distressed to be 3.0 for boys, 1.6 for girls, and 1.6 for immigrants and for having low school grades to be 2.0 for boys and girls, and 1.6 for immigrants. They concluded that skipping breakfast was common for tenth graders and that the implications of this behavior was stronger for boys than for girls and stronger for Norwegian students than their immigrant peers.

**Citation:** Lien, L., Lien, N., Heyerdahl, S., Thoresen, M., & Bjertness, E. (2006). **Consumption of Soft Drinks and Hyperactivity, Mental Distress, and Conduct Problems Among Adolescents in Oslo, Norway.** *American Journal of Public Health*, 96(10), 1815-1820. doi: 10.2105/AJPH.2004.059477

**Link:** <http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2004.059477>

**Summary/Description:** This study looked at whether consuming a lot of sugary soft drinks was associated with hyperactivity, conduct problems, and mental distress in adolescents. The sample of 7,343 tenth grade students were part of a larger Oslo Health Study utilizing survey methodology. The results indicated a dose-response relationship where students who consumed moderate amounts of soft drinks had the lowest levels of symptoms, those who did not consume any soft drinks had somewhat increased levels of symptoms, and those who consumed the highest amounts of soft drinks had the highest levels of symptoms—with those drinking four or more classes of soft drinks having the highest odds ration for conduct problems.

**Citation:** Melchoir, M., Caspi, A., Howard, L. M., Ambler, A. P., Bolton, H., Mountain, N., & Moffitt, T. E. (2009). **Mental health context of food insecurity: A representative cohort of families with young children.** *Pediatrics*, 124(4), e564-e572. doi:10.1542/peds.2009-0583

**Link:** <http://pediatrics.aappublications.org/content/124/4/e564.short>

**Summary/Description:** In this study, the authors tested the hypothesis that low-SES families are particularly vulnerable to food insecurity when the mother experiences additional challenges—depression, psychosis spectrum disorder, alcohol or drug abuse, or domestic violence. A nationally representative sample from the British Environmental Risk Longitudinal Study was used and data was collected using validated methods. Findings indicated that, controlling for income variation, low-SES families were more likely to experience food insecurity if maternal depression (odds ratio [OR]: 2.82), maternal psychosis spectrum disorder (OR: 4.01), or domestic violence (OR: 2.36) co-occurred. Food security also predicted higher rates of behavior problems in children. The authors suggest that interventions to improve women’s mental health could also help decrease the burden of food insecurity on children.

**Citation:** Munoz, M. A., Fito, M., Marrugat, J., Covas, M. I., Schroder, & Regidor and Hermes Investigators. (2009). *British Journal of Nutrition*, 101(12), 1821-1827. doi:10.1017/S0007114508143598

**Link:** <http://www.regidor.org/media/upload/research/pdf/190798481334223474.pdf>

**Summary/Description:** This study sought to analyze the association between self-perceived physical and mental health functioning and adherence to the Mediterranean diet (commonly high in plant foods, low on meats, and moderate with alcohol). Researchers controlled for a variety of confounding effects such as BMI, age, alcohol consumption, and presence of chronic conditions. The sample included 7145 adults in Gerona, Spain. Quality of life was measured using the SF-12 Health Survey, diet was assessed using a Food Frequency Questionnaire (FFQ), additional data (e.g., medical history, lifestyle) was collected using additional questionnaires, and weight and height measurements were collected in-person by trained professionals. Using age-adjusted linear regression, a significant direct association was found between the Mediterranean diet score (MDS) and self-reported mental and physical health in men and women. They concluded that adhering to the Mediterranean diet was associated with higher scores for self-perceived health.

**Citation:** Sanchez-Villegas, A., Verberne, L., De Irala, J., Ruiz-Canela, M., Toledo, E., Serra-Majem, L., & Martinez-Gonzalez, M. A. (2011). **Dietary fat intake and the risk of depression: The SUN project.** *PLoS ONE*, 6(1), e16268. doi:0.1371/journal.pone.0016268

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0016268>

**Summary/Description:** This study, conducted in Spain, assessed the relationship between dietary fat consumption and depression amongst a population of Spanish university graduates. The participants were given a food frequency questionnaire to determine the amounts of different fats (i.e. saturated fats, trans fats, unsaturated fats, culinary fats) they consume on a daily basis. Mental health status of the participants was assessed during the follow-up visit. The researchers concluded that the intake of trans unsaturated fats was associated with depression risk. On the other hand, there were weak correlations between the intake of monounsaturated fatty acids, polyunsaturated fatty acids, and culinary fats and risk of developing depression.

**Citation:** Sanchez-Villegas, A., Toledo, E., de Irala, J., Ruiz-Canela, M., Pla-Vidal, J., & Martinez-Gonzalez, M. A. (2011). **Fast-food and commercial baked goods consumption and the risk of depression.** *Public Health Nutrition*, 15(3), 424-432. doi:10.1017/S1368980011001856

**Link:** <http://www.neurosafari.com/wp-content/uploads/2015/03/S1368980011001856a.pdf>

**Summary/Description:** In this study conducted in Spain, the researchers sought to understand the relationship between the consumption of fast-food (burgers, pizza, etc) and baked goods (muffins, doughnuts, etc) and the incidence of depression. During the follow-up, incidence of depression was reported if the participant was diagnosed with depression or if they were started on medication. After analysis, the researchers found that those participants that consumed higher amounts of fast food had a higher risk of depression than those that consumed less amounts of fast foods. They found no association between the consumption of baked goods and incidence of depression.

**Citation:** Sarlio-Lahteenkorva, S., Lahelma, E., & Roose, E. (2003). **Mental health and food habits among employed men and women.** *Appetite*, 42(2), 151-156. doi:10.1016/j.appet.2003.08.014

**Link:** <http://www.sciencedirect.com/science/article/pii/S0195666303001545>

**Summary/Description:** This research study was conducted in Finland. It sought to understand the relationship between mental health status and food consumption in working men and women. The participants were middle-aged men and women. They were given the General Health Questionnaire which categorized them as having either 'poor' mental health or 'normal' mental health. The participants were then asked to report their food consumption. The researchers found that those women who fell under the 'poor' mental health classification reported consuming less fresh fruits and vegetables and low-fat foods compared to those that fell into the 'normal' mental health classification. Men who fell into the 'poor' mental health classification reported consuming less fresh fruits and dark break compared to those who fell into the 'normal' mental health classification. The researchers concluded that poor mental health status was correlated with poor eating habits.

**Citation:** Schmidt, M. H., Mocks, P., Lay, B., Eisert, H. G., Fojkar, R., Fritz-Sigmund, D., Marcus, A., & Musaeus, B. (1997). **Does oligoantigenic diet influence hyperactive/conduct-disordered children—a controlled trial.** *European Child & Adolescent Psychiatry*, 6(2), 88-95.

**Link:** <http://link.springer.com/article/10.1007/BF00566671>

**Summary/Description:** This double-blind crossover study looked at the effectiveness of an oligoantigenic diet—comprised of two kinds of meat, two sources of carbohydrates, two kinds of vegetables, and two fruits, and water or apple juice to drink—on children with hyperactive/disruptive behavior disorder and compared the diet's effects with those of pharmacological therapy. The sample consisted of 47 boys and 2 girls in an inpatient treatment facility in Mannheim, Germany. The participants went through a multi-phase process consisting of baseline collection, periods of control and oligoantigenic diets, a second baseline, and then pharmacological therapy. Of the 47 participants, 12 showed significant improvement in two behavior ratings when on the oligoantigenic diet condition. In contrast, 36 of the participants had significant improvement in behavior ratings during the pharmacological therapy phase. The authors conclude that though the diet was effective with a minority of participants, it should continue to be considered and researched further.



**Citation:** Sonuga-Barke, E. J. S., Brandeis, D., Cortese, S., Daley, D., Ferrin, M., Holtmann, M., ... European ADHD Guidelines Group. (2013). **Nonpharmacological interventions for ADHD: Systematic review and meta-analyses of randomized controlled trials of dietary and psychological treatments.** *American Journal of Psychiatry*, 170(3), 275-289. doi:10.1176/appi.ajp.2012.12070991

**Link:** <http://ajp.psychiatryonline.org/doi/pdf/10.1176/appi.ajp.2012.12070991>

**Summary/Description:** This meta-analytic study looked at the efficacy of ADHD treatments based on diet (e.g., restricted elimination, free fatty acid supplementation) and psychological (e.g., neurofeedback, cognitive training) intervention. Studies were identified for possible inclusion based on key-word searches in electronic databases and of the 2,904 identified, 54 met inclusion criteria for the analysis. Results differed depending on the focus of analysis. All dietary and psychological treatments had effects that were statistically significant when proximal assessments were done. Only free fatty acid supplementation and artificial food color had significant effects when a probably blinded assessment procedure was used.

**Citation:** Tomlinson, D., Wilkinson, H., & Wilkinson, P. (2009). **Diet and mental health in children.** *Child and Adolescent Mental Health*, 14(3), 148-155. doi:10.1111/j.1475-3588.2008.00520.x

**Link:** <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-3588.2008.00520.x/abstract>

**Summary/Description:** This article reviews literature on the of diet in the school performance, cognitive development, and behaviour of children. Attention is paid to research related to food additives, essential fatty acids, and micronutrients. The authors state that children need to have a diet that is nutritionally balanced for both physical and mental development.

**Citation:** van Edmond-Frohlick, A. W. A., Weghuber, D., & de Zwaan, M. (2012). **Association of symptoms and Attention-Deficit/Hyperactivity Disorder with physical activity, media time, and food intake in children and adolescents.** *PLoS ONE*, 7(11), e49781. doi:10.1371/journal.pone.0049781

**Link:** <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0049781>

**Summary/Description:** This study aimed to understand the relationship between symptoms of ADHD, the time a child spent watching TV, and dietary consumption. Children and adolescents, ages 6-17, were evaluated on their media exposure, dietary consumption, and exercise habits. The parents of the children were administered questionnaires in order to understand their behavior and assess ADHD symptoms. The researchers found positive correlations between the SDQ-HI (ADHD Questionnaire) scores and exercise, average caloric food consumption, total energy intake, and media exposure. On the other hand, they found a negative correlation between the SDQ-HI scores and the nutritional quality of food that the children consumed.

## NEW ZEALAND

**Citation:** Crowe, F. L., Skeaff, C. M., Green, T. J., & Gray, A. R. (2007). **Serum phospholipid n-3 long-chain polyunsaturated fatty acids and physical and mental health in a population-based survey of New Zealand adolescents and adults.** *American Journal of Clinical Nutrition*, 86(5), 1278-1285.

**Link:** <http://ajcn.nutrition.org/content/86/5/1278.full>

**Summary/Description:** This study sought to assess whether there is an association between n-3 long-chain polyunsaturated fatty acids in serum phospholipids and mental and physical well-being. Analysis was done on data from 2416 individuals, ≥15 years of age, who participated in New Zealand's 1997 National Nutrition Survey. They found that self-rated physical well-being was positively associated with the proportion of eicosapentaenoic acid

and the ratio of eicosapentaenoic to arachidonic acid. There was also a significant positive trend across the ratio of eicosapentaenoic to arachidonic acid for mental well-being.

### MULTI-COUNTRY

**Citation:** Harpham, T., Huttly, S., De Silva, M. J., & Abramsky, T. (2005). **Maternal mental health and child nutritional status in four developing countries.** *Journal of Epidemiol Community Health, 59*, 1060-1064. doi:10.1136/jech.2005.039180

**Link:** <http://jech.bmj.com/content/59/12/1060.full>

**Summary/Description:** This study tested a hypothesis that common mental disorders (CMD) in mothers are associated with poorer nutritional status in young children. Countries of focus were Ethiopia, India, Vietnam, and Peru. Cross sectional surveys were administered in 20 sites in each country, representing poor and middle income urban and rural populations in each country. The total sample size of mothers and children, 6-18 months, was 2000 in each country. Analysis found that there was a relationship between high maternal CMD and poor child nutritional status in India and Vietnam but no clear relationship among samples in Ethiopia or Peru.

**Citation:** Jane-Llopis, E., Hosman, C., & Patel, Vikram. (2005). **Mental health promotion works: A review.** *Global Health Promotion: Promotion & Education Supplement, 12*(9), 9-25.

doi:10.1177/10253823050120020103x

**Link:**

[https://www.researchgate.net/profile/Clemens\\_Hosman/publication/7777655\\_Mental\\_health\\_promotion\\_works\\_A\\_review/links/09e41510662790ae84000000.pdf](https://www.researchgate.net/profile/Clemens_Hosman/publication/7777655_Mental_health_promotion_works_A_review/links/09e41510662790ae84000000.pdf)

**Summary/Description:** The authors review literature relevant to mental health promotion and frame their discussion within the five headings of the Ottawa Charter for Health Promotion organized by the World Health Organization (Building Healthy Public Policy, Creating Supportive Environments, Strengthening Community Action, Developing Personal Skills, and Reorienting Health Services). The literature base represents a variety of approaches to research and comes from throughout the world, including low- and middle-income countries. Nutrition explicitly comes in under the first two discussion headings, noting the value of childhood nutrition programs for the economically disadvantaged and the role of nutrition education in parent home visiting and mentorship programs.

**Citation:** Lakhan, S. E., & Vieira, K. F. (2008). **Nutritional therapies for mental disorders.** *Nutrition Journal, 7*(2). doi:10.1186/1475-2891-7-2

**Link:** <https://nutritionj.biomedcentral.com/articles/10.1186/1475-2891-7-2>

**Summary/Description:** This article is focused on dietary supplements that can help with treating major depression, obsessive compulsive disorder (OCD), schizophrenia, and bipolar disorder—the four more common mental disorders affecting those in developed countries including America. It looks at nutritional deficiencies associated with these disorders and how dietary supplements can be used in treatment. The studies cited were often conducted in the 1970s and 1980s, though the article author states that underfunding was the reason that the research on this area stopped and not that the methods under research didn't show promise.

**Citation:** McGrath-Hanna, N. K., Greene, D. M., Tavernier, R. J., & Bult-Ito, A. (2003). **Diet and mental health in the arctic: Is diet an important risk factor for mental health in circumpolar peoples? – A review.** *International Journal of Circumpolar Health, 62*(3), 228-241.

**Link:** <http://journals.co-action.net/index.php/ijch/article/viewFile/17560/20011>

**Summary/Description:** This article seeks to develop a link between the mental health and changing diets (from traditional to processed groceries) of Circumpolar peoples. Literature

relating to Arctic and subarctic areas around the world was identified using keywords (e.g., diet, omega-3 fatty acids, mental health). The authors concluded that changing from traditional diets has already led to increased health problems and a decline in mental health in these populations.

**Citation:** Patel, V., Flisher, A. J., Nikapota, A., & Malhotra, S. (2008). **Promoting child and adolescent mental health in low and middle income countries.** *The Journal of Child Psychology and Psychiatry*, 49(3), 313-334. doi:10.1111/j.1469-7610.2007.01824.x

**Link:**

<http://www.sangath.com/images/file/Promoting%20child%20and%20adolescent%20mental%20health%20....pdf>

**Summary/Description:** This paper briefly reviews the importance of child and adolescent mental disorders to public health in low and middle income countries, including risk and protective factors for mental disorders. The authors outline several potential strategies for child and adolescent mental health promotion in these countries with particular focus on capacity building (for children, adolescents, families, communities) and structural interventions. In reviewing relevant literature, the role of under-nutrition as a risk factor, interventions to address malnutrition, and multi-component interventions including nutritional and psychosocial components are discussed.

**Citation:** Peet, M. **International variations in the outcome of schizophrenia and the prevalence of depression in relation to national dietary practices: An ecological analysis.** *The British Journal of Psychiatry*, 184(5), 404-408.

**Link:** <http://bjp.rcpsych.org/content/184/5/404>

**Summary/Description:** The aim of this paper was to explore dietary predictors for both the prevalence of depression and the outcome of schizophrenia. Existing databases on international variations in patterns of food usage, prevalence of depression, and outcome of schizophrenia were identified and used for ecological analysis. Findings included that a worse two-year outcome of schizophrenia was predicted by higher national dietary intake of dairy products and refined sugar and that a low intake of fish and seafood predicted a high prevalence of depression nation-wide. The authors note that these predictors are similar to those for other (physical) illnesses and indicate that dietary intervention studies should be done relating to schizophrenia and depression.

**Citation:** Rahman, A., Patel, V., Maselko, J., & Kirkwood, B. (2008). **The neglected 'm' in MCH programmes—why mental health of mothers is important for child nutrition.** *Tropical Medicine & International Health*, 13(4), 579-583. doi:10.1111/j.1365-3156.2008.02036.x

**Link:** <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-3156.2008.02036.x/full>

**Summary/Description:** This article makes a case for promoting maternal mental health and treating maternal mental illness as a way to reduce children's undernutrition. It pulls evidence for this proposed shift in practice in child nutrition programs from observational studies and clinical trials conducted in less-developed countries.