
Glossary

5-HIAA: 5-hydroxyindoleacetic acid, a breakdown product of serotonin.

5-HIAA test: N = 3–15 mg/24 h. Foods that can interfere with measuring and test results include plums, pineapple, bananas, eggplant, tomatoes, avocados, and walnuts. They should be omitted from the diet 3 days before the test.

5-HTP: 5-Hydroxytryptophan, a precursor to the neurotransmitter serotonin.

AA: An abbreviation for arachidonic acid, a conditionally essential, long-chain fatty acid that has 20 carbons and 4 double bonds.

Accommodation: The protein-sacrificing response to an inadequate intake; a physiologic compromise with adverse health consequences.

Adaptation: The adjustment of an organism to its environment, when, during starvation the brain switches from glucose-based (carbohydrate) fuel supply to ketone-based (fat) fuel supply.

ADHD: Attention deficit hyperactivity disorder.

AHRQ: Agency for Healthcare Research and Quality.

ALA: Alpha-linolenic acid.

Apoenzyme: The protein component of an enzyme which can be separated from a coenzyme (often a vitamin) but that requires the coenzyme to function.

Bariatric surgery: Surgery for treatment of excessive weight; often referred to as gastric bypass surgery.

BED: Binge eating disorder.

BH4: Tetrahydrobiopterin, used in the treatment for some patients with phenylketonuria; see also **Sapropterin**.

Bipolar disorder: A mood disorder characterized by vacillation between highs of euphoria and lows of depression.

BMI: Body mass index; a measure of weight relative to height.

Calorie, kcal: A measure of energy; either energy in foods, energy used in activity and body maintenance, or energy stored in the body for future use.

CAM: Complementary and alternative medicine.

Cheilosis: A noninflammatory condition of the lips, characterized by fissuring. Cheilosis denotes relationship to the lips or to an edge.

CNS: Central nervous system.

Cochrane Review: The Cochrane Library is a collection of databases that contain high-quality, independent evidence to inform healthcare decision-making. To accomplish this, The Cochrane Collection is divided into Cochrane Review Groups, each of which concentrates on a specific healthcare area. Each group report represents the highest level of evidence to date on which to base clinical treatment decisions.

Cognition: Mental function, as contrasted with emotional function. Cognitive domains include executive function (abstraction, mental flexibility), memory (verbal, spatial, facial), and intellect (language, spatial).

Correlation: A condition when a phenomenon changes in conjunction with change in another phenomenon; the phenomena may change in the same direction ↑↑ (positive correlation) or in the opposite direction ↓↓ (negative correlation).

Cretin/cretinism: The congenital lack of thyroid secretion with arrested physical and mental development.

CRP: C-reactive protein, a metabolic indicator of the presence of inflammation.

CSF: Cerebral spinal fluid.

De novo mutations: A genetic mutation that is neither possessed nor transmitted by a parent.

DHA: Docosopentaneoic acid, a 22-carbon, omega-3 fatty acid that plays a role in membrane structure.

Dysthymia: A mild but chronic form of depression. Symptoms may be less intense than those of major depression, but can affect one's life seriously because it lasts for so long, perhaps years. Symptoms may include poor appetite or overeating, insomnia or excessive sleep, low energy or fatigue, low self-esteem, poor concentration, indecisiveness, and hopelessness.

Eating disorder: A condition characterized by abnormal, unrealistic perspective on weight, body image, eating habits, and food consumption. Eating disorders include anorexia nervosa, bulimia nervosa, and binge eating disorder.

EFA: Essential fatty acid, which includes linoleic, linolenic, and arachidonic acids.

Enzymopathy: Abnormalities in enzymes.

EPA: Eicosapentaenoic acid, a 22-carbon, omega-3 fatty acid that plays a role in membrane function.

EPC: Evidence-based practice centers.

Epigenetics: Having an effect on genetic transcription without a change in DNA sequence.

Epiphenomenalism: The doctrine that mental activities are simply epiphenomena of the neural processes of the brain and have no causal influence.

Epiphenomenon: An accessory, exceptional, or accidental occurrence in the course of an attack of any disease; an additional condition in the course of a disease not necessarily connected to the disease; a secondary phenomenon overlapping and resulting from another.

Essential fatty acids (EFA): Long chain fatty acids not made in the body including linoleic acid (O-6), linolenic acid (O-3), and arachidonic acid.

ETC: Electron transport chain.

Executive function: Refers to cognitive ability to think abstractly; mental flexibility.

Experimental neurosis: Neurotic symptoms produced by restriction of the diet and reversed by means of controlled nutritional rehabilitation.

Extrapyramidal symptoms: Include extreme restlessness, involuntary movements, and uncontrollable speech, such as tongue movements, lip smacking, movement of arms, legs, fingers, or eye blinking and may occur as a side effect of antipsychotic medications.

FAE: Fetal alcohol effect. FAE is a term less preferred than FAS, which refers to alcohol-related birth defects and neurodevelopmental disorders.

FAS: Fetal alcohol syndrome. FAS is a cluster of abnormalities including physical, behavioral, and cognitive effects associated with prenatal exposure to alcohol.

Fasting state: Often defined as the point in time when the liver glycogen stores are exhausted.

Fatigue: Has been described by three subscales of the Fatigue Symptom Checklist as being general, physical, or psychological fatigue.

fL: Femtoliter. The SI prefix “femto” represents a factor of 10^{-15} ; One femtoliter = 10^{-15} liter. One U.S. ounce liquid is equal to 29,573,529,687,517.04 fL (29 trillion).

Folate/folic acid: A B-vitamin; folate is found in foods; functions as the tetrahydrofolate reduced form; folic acid is the synthetic oxidized form and must be converted to tetrahydrofolate by the enzyme dihydrofolate reductase (DHFR) to be used by the body.

Fluid intelligence: Involves reasoning, the capacity to solve complex problems, the ability to think abstractly, and the ability to learn.

fMRI: Functional magnetic resonance imaging.

Functional disease/disorder: A condition that affects function, but not structure.

Functional testing: Assessment of enzyme-dependent activity; necessary for detection of suboptimal levels of many nutrients and metabolites. A given nutrient may be present, but it may not be properly activated, appropriately localized, or have sufficient cofactors to function at a normal level of activity. The result will be a defect in the biochemical pathways that depend upon that nutrient for optimal function. A deficient or defective pathway may operate at a sub-optimal level for many months, or even years, before a clinical symptom becomes apparent.

GABA: Gamma-aminobutyric acid.

Gastric bypass surgery: A procedure for decreasing the volume of the stomach and absorption area for nutrients. In vertical banded gastroplasty, a small stomach pouch is constructed and the outlet from the stomach to the small intestine (duodenum) is restricted. In gastric bypass surgery, a small stomach pouch is constructed that has an outlet directly to the jejunum, rather than the usual outlet into the duodenum. Most nutrient absorption normally occurs in the duodenum.

g/dl: Grams per deciliter. A deciliter is a fraction of a liter; 1 liter is approximately 1 quart. A deciliter is 1/10 of a liter. Gram per deciliter refers to the weight per volume of a substance (e.g., 1 gm/dl of glucose indicates that there is 1 g of glucose in 1 dl of blood.)

Genotype: The internally coded, inheritable information carried by all living organisms. This stored information is used as a “blueprint” or set of instructions for building and maintaining a living creature. These are written in a coded language (the genetic code), and are passed from one generation to the next; the class to which that organism belongs is determined by the description of the actual physical material made up of DNA that was passed to the organism by its parents.

GLA: Gamma-linolenic acid, derived from omega-6 fatty acids.

Glossitis: Inflammation of the tongue.

Hcy: Homocysteine.

HDL: High-density lipoproteins, a fraction of cholesterol found in the body, commonly referred to as “good cholesterol.”

High calorie malnutrition: Poor nutritional status and the associated compromise of metabolic systems resulting from the imbalance of nutrient need and supply. High calorie malnutrition may be the result of poor diet (an excess of empty calories). Increase of need may be due to disease, genetic alteration, or increased excretion. High calorie malnutrition frequently applies to an inadequate intake of vitamins and minerals while calorie and protein needs are met.

Homeostasis; psychological homeostasis: Tendency to maintain stability or balance in normal bodily states; a state of psychological

equilibrium obtained when tension or a drive has been reduced or eliminated; stability may be maintained even if it is detrimental.

HUFA: Refers to highly unsaturated fatty acids.

Hysteria: Current terms for hypochondriasis and hysteria include somatization disorder, conversion disorder, and dissociative disorder or histrionic personality. Part of the “neurotic triad.”

Incidence: A statistical term defined as the number of new cases of disease over a period of time divided by the number of people at risk during that period of time (e.g., the number of new cases of polio in 2001 divided by the population of the United States in 2001). See also **Prevalence**.

Inositol: A six-carbon molecule present as a free molecule or as part of phospholipids. Unbound inositol is relatively higher in neural tissue than in plasma. Inositol is synthesized in the body and does not appear to be toxic in high dietary amounts unless inositol metabolism is impaired. Found in animal protein foods or in plant foods as phytates.

IU: International units, a measure of quantity or activity of some vitamins, especially fat-soluble vitamins with several molecular forms with different activity in the body (e.g., the alpha/α and gamma/γ forms of vitamin E/tocopherol).

LDL: Low-density lipoprotein, a fraction of cholesterol found in the body, commonly referred to as “bad cholesterol.”

Linolenic acid: An omega-3 polyunsaturated fatty acid; alpha linolenic acid (ALA) has double bonds in the 9, 12, 15 position; gamma linolenic acid (GLA) has double bonds in the 6, 9, 12 positions.

LNAA: Large neutral amino acids, which include tryptophan, phenylalanine, tyrosine, lucine, isoleucine, valine, methionine, threonine, serine, and cysteine.

Macrocytosis: The enlargement of red blood cells.

Malnutrition: May refer to the state of being undernourished or over-nourished; malnutrition is a disorder of nutrition. The AMA Council on Foods and Nutrition defined malnutrition as a state of impaired functional ability, of deficient structural integrity or development brought about by a discrepancy between the supply to the body tissues of essential nutrients and calories, and the biologic demand for them. (*Source: Carl C, Pfeiffer, PhD, MD, Mental and Elemental Nutrients*, p. 4. 1975, Keats Publishing Company, New Canaan, Connecticut.)

MAOI: Monoamine oxidase inhibitor, a class of anti-depressants.

mEq; milliequivalent: A measure of quantity of a substance. An mEq is the atomic weight (or molecular weight if the substance is a complex molecule) noted in mg (one one-thousandth [1/1000] of a gram, 10^{-3}).

Metabolic syndrome (also called syndrome X): A combination of medical disorders including the presence of high blood pressure, high LDL and low HDL in the blood, obesity, insulin resistance, and high glucose.

Metabolism: Refers to the sum of the physical and chemical processes by which simpler compounds are converted into living, organized substances.

Metabolite: A substance derived by metabolism.

Mentalization: Being mindful of what others are thinking and feeling as well as being mindful of your own thoughts and feelings.

Metaparadigm: An abstract statement of the domains of professional concern.

Mercury toxicity: Refers to the health hazards of mercury. Foods generally contain levels of mercury below 50 ng/g. Fish may contain 10–1500 ng/g or higher, depending on the environment of the fish. The acceptable limit for fish marketed in the United States and other countries is 0.4–1.0 mg/kg of mercury. This equals 400 ng/g. (John N. Hatchcock and Jeanne I. Rader in *Modern Nutrition in Health and Disease*, 2:1, 598, 1994.)

microgram: µg, mcg. Refers to a unit of weight; 1 millionth of a gram or one 1/1000 of a mg.

micromole: µmol. A measure of quantity/weight; refers to 1 millionth of a mole, which is the molecular weight in grams.

MMA: Methyl malonic acid, which is involved in vitamin B₁₂ metabolism.

MMPI: Minnesota Multiphasic Personality Inventory.

MRI: Magnetic resonance imaging.

MTHFR: Methyltetrahydrofolate reductase, an enzyme involved in the metabolism of folate, which is a source of methyl groups; two polymorphisms and lowered enzyme activity of MTHFR demonstrates an association between the genetic variants and depression, schizophrenia, and bipolar disorder.

MUFA: Monounsaturated fatty acids.

Myopathy: A disease of the muscles.

N: May refer to the number of subjects in a research study (e.g., N = 24 males and N = 26 females), or may refer to normal, or expected, laboratory values for a healthy person (e.g., N = 75–100 mg/dl).

NAD: Nicotinamide adenine dinucleotide.

NADH: NAD plus an H⁺ ion.

NES: Night eating syndrome.

Neuropathy: A disease of the nerves.

Neurotic triad: A combination of hypochondriasis, hysteria, and depression; often derived from four scales of the MMPI psychological test. “Hysteria” is now described as somatization disorder, histrionic personality, or other terms.

Neuroticism: One of five domains of adult personality; six facets of neuroticism include anxiety, angry hostility, depression, self-consciousness, impulsivity, and vulnerability.

Neurotransmitters: Biochemicals in the body that participate in the transmission of signals along the central and peripheral nerves, including serotonin, epinephrine, dopamine, and norepinephrine. Amino acids from the diet that are converted to neurotransmitters include tryptophan, tyrosine, and choline. Tyrosine and L-phenylalanine are precursors to dopamine and norepinephrine. Tryptophan is the precursor to serotonin.

Neutraceutical: Any substance that may be considered a food or part of a food and provides medical or health benefits, including the prevention and treatment of disease.

ng: Nanogram, which is a measure of quantity equal to one-billionth of a gram, or one-one-thousandth of a microgram.

NHANES: National Health and Nutrition Examination Survey.

NIDDM: Non-insulin dependent diabetes mellitus (Type 2).

Nootropics: Cognition-enhancing drugs.

Normal: May refer to a usual, expected, or typical pattern state (e.g., a normal blood value is a value that falls within a range usually not associated with a health problem); in psychology, refers to the average in some quality such as intelligence or personality traits.

Nutrigenetics: Refers to the influence of the genes; gene alteration is the problem, foods and nutrients are the solution.

Nutrigenomics: Refers to the influence of nutrients (an environmental influence) on genes and gene expression.

Nutritional genomics: Refers to the scientific field of nutrient-gene interaction.

Nutritional injury: A compromise in metabolism related to the excess or deficiency of a nutrient, or dys-adaptation of a nutrient-related system in the body.

NQOL: Nutritional quality of life; may include “being able to eat what I want, when I want.” The taste, pleasure, enjoyment, comfort, or socialization that we experience from food and mealtimes.

O-3: Omega-3 fatty acid.

O-6: Omega-6 fatty acid.

OCD: Obsessive-compulsive disorder.

Orthorexia: Obsession with a perfect diet or a fixation on righteous eating.

Oxidative stress: Refers to the effect of excess (greater than normal production) free radical molecules produced during ATP (energy) production in the mitochondria and their potential damage to lipid cell membranes, DNA, enzymes, neurotransmitters, and structural proteins.

p or P: A designation for statistical probability; indicating the probability of making an error in drawing a conclusion from data. A Type I error (false positive) occurs when the null hypothesis is rejected when it is actually true in the specified population. A Type II error (false negative) occurs when a null hypothesis is not rejected when it is actually false in the population.

Paresthesia: A diseased or unhealthy sensation.

pg: Picograms, a measure of quantity equal to one-trillionth of a gram.

Pharmacological/pharmaceutical: As in the “pharmacological/pharmaceutical dose,” of a nutrient refers to a dose higher than is expected to be effective or needed for nutritional functions alone (e.g., taking a vitamin at 20 times more than the Reference Daily Intake is not a neutraceutical dose, but a pharmacological dose. At such intakes, the vitamins may be expected to function differently. Niacin prescribed for lowering cholesterol levels is a pharmacological dose of a B-vitamin. Liver enzymes must be monitored in any individual taking the high dose to assure that the dose is safe.)

Phenotype: The outward, physical manifestation of an organism. These are the physical parts, the sum of the atoms, molecules, macromolecules, cells, structures, metabolism, energy utilization, tissues, organs, reflexes, and behaviors; anything that is part of the observable structure, function or behavior of a living organism; the class to which that organism belongs as determined by the description of the physical and behavioral characteristics of the organism.

Phospholipids: Refers to a fatty acid with a phosphorous-oxygen duo, plus possible other molecular combinations linked to it. Phospholipids provide a plausible biochemical explanation for interaction between genetic and environmental factors in psychiatric disorders. These compounds link the essential fatty acids from the environment (diet) and the genetic control of enzymes that control essential fatty acids in the body.

Polymorphism: A genetic substitution that occurs in more than 1% of a population.

PPM or ppm: Refers to parts per million, the amount of one substance dissolved in or mixed into another.

Prevalence: A statistic defined as the number of people who have a given disease at one point in time divided by the number of people at risk at that point in time (e.g., the number of people who are depressed in the year 2000 divided by the population of the United States in the year 2000 would give you the prevalence of depression during that year). See also **Incidence**.

Pseudotumor cerebri: An enlargement that resembles a tumor possibly resulting from inflammation or fluid accumulation; cerebral

edema and raised intracranial pressure with normal cerebrospinal fluid, headache, nausea, vomiting, and papilledema that is without neurological signs except occasional sixth-nerve palsy.

Psychiatry: A medical discipline that deals with illnesses, the signs and symptoms of which are manifest in disorders of emotion, thinking, and behavior. Psychiatry is concerned with disorders of mood, cognition, and behavior including depression, mania, cognitive disorders, mental retardation and organic brain syndromes, and personality and behavior disorders ranging from drug and alcohol abuse to neuroses and psychoses.

PTSD: Post-traumatic stress disorder.

PUFA: Polyunsaturated fatty acids.

r: A designation for statistical correlation.

RNA: Ribonucleic acid.

RR (Relative risk): A measure of how much a particular risk factor (say, cigarette smoking) influences the risk of a specified outcome (say, death by age 70). This specifies the amount of risk that the study indicates an individual might have in (1) contracting the studied condition or (2) having effective treatment from the treatment studied.

Sapropterin: Tetrahydrobiopterin (BH4), a co-factor for three enzymes used in the degradation of amino acid phenylalanine and in the biosynthesis of the neurotransmitters serotonin (5-hydroxytryptamine, 5-HT), melatonin, dopamine, norepinephrine (noradrenaline), and epinephrine (adrenaline).

Seborrheic dermatitis: Excessive secretion of sebum (sebum is a thick, semi-fluid substance composed of fat and debris from epithelial [skin] cells); pertaining to areas in which sebaceous glands are abundant.

Semi-starvation: A form of malnutrition in which food is eaten but in quantities not sufficient to meet bodily needs.

Serotonin syndrome: A drug reaction in which there is an accumulation of excessive amounts of serotonin; excess production or insufficient rate of breakdown of the neurotransmitter serotonin.

SFA: Saturated fatty acids.

Somato-psychic disorder: A nutritional-biochemical imbalance that creates an emotional effect (Abbey).

SSRI: Selective serotonin reuptake inhibitors.

Starvation: A form of malnutrition in which the intake amount of food and nutrients is negligible or minimal.

Stroop test: A test indicating attentional ability and executive function.

In Stroop matching tasks, participants indicate whether the name of a color matches the word printed in color. The test may time how long it takes for an individual to say “green” when seeing

the word “orange” displayed in the color green. The response time may be delayed for emotion-laden words, such as the word “fat” presented to an individual with an eating disorder.

Subthreshold disorders: Not meeting the diagnostic cutoffs in the DSMIV or ICD 10. (Shankman et al. 2009, Ch. 2) Subthreshold conditions as precursors for full syndrome disorders: a 15-year longitudinal study of multiple diagnostic classes SA Shankman, PM Lewinsohn, DN Klein, JW Small, JR Seeley, SE Altman *Jour. of Child Psychol. and Psych.* 50 (12), 1485–1494. See also Lewinsohn, P.M., S.A. Shankman, J.M. Gau, and D.N. Klein. The prevalence and co-morbidity of subthreshold psychiatric conditions. *Psychol. Med.* 34(4):613–622, 2004.

Syndrome X: See **Metabolic syndrome**.

Tardive dyskinesia: Involuntary movements that sometimes develop from the use of antipsychotic medications.

TC: Transcobalamin or total cholesterol, depending on the context.

TCA: Tricarboxylic acid cycle, a cycle/flow of body metabolites that produces energy from food in the mitochondria.

Teratogen: Causing abnormal development in embryos.

Tertile: Division of a group into three equal parts for comparison (e.g., his score was in the upper tertile.)

Tetrahydrobiopterin (BH4): See **Sapropterin**.

TKA: Transketolase activity.

Tocopherol: Vitamin E; alpha-tocopherol is the most biologically active form and is a potent antioxidant. Gamma-tocopherol has anti-inflammatory properties and is more abundant in the U.S. diet.

TPN: Total parenteral nutrition, which refers to supplying nutrients via a tube into the blood stream, rather than into the gastrointestinal tract.

TPPE: Thiamin pyrophosphate effect on erythrocyte transketolase, which refers to the percentage of uptake with a known dose. (Interpretation of the stimulation assay: A change 0–15% is considered normal. A change of 16–24% is considered a marginal deficiency. A change >25% is considered a deficiency of thiamin. H.E. Sauberlich, p. 40).

Vitamin deficiency: An often co-occurring insufficient level of vitamins in the body to support energy production, normal metabolism, and growth. Unlike few other categories of disease, vitamin deficiency affects both the central nervous system and the peripheral nervous system.

Wernicke Korsakoff Psychosis (KP): The chronic form of WE characterized by severe short-term memory loss.

Wernicke-Korsakoff syndrome (WKS): The term used to refer to a combination of WE and KP as if it were a single entity.

Wernicke's Encephalopathy (WE): The acute phase of a relatively common and potentially lethal condition resulting from thiamine deficiency.

WKS: Wernicke-Korsakoff syndrome.

Terminology used in research

In a **case-control** study, patients who have developed a disease or condition are identified and their past exposure to suspected etiological factors is compared with that of controls or referents that do not have the disease or condition. The starting point for the follow-up may occur back in time (retrospective cohort) or at the present time (prospective cohort). In either situation, participants are followed to determine whether they develop the outcome of interest. For a case-control study, the outcome itself is the basis for selection into the study. Previous interventions or exposures are then evaluated for possible association with the outcome of interest.

A **case study** is an in-depth description of the factors related to a disease, disorder, or condition in a specific individual.

Clinical significance is usually based on the size of the effect observed, the quality of the study that yielded the data, and the probability that the effect is a true one. Clinical significance is not the same as statistical significance; a finding in a study may demonstrate a statistical difference in an attribute under review, but this may have no impact clinically.

Coherence examines whether the cause-and-effect interpretation for an association conflicts with what is known of the natural history and biology of the disease and the relevance for developing clinical recommendations.

A **cohort** is a subset of a population with a common feature, such as age, gender, or occupation. In a cohort study, a group is assembled and followed forward in time to evaluate an outcome of interest. Factors related to the development of disease are measured initially in a group of persons, known as a cohort. The group is followed over a period of time and the relationship of a factor to the disease is examined. The population may be divided into subgroups according to the level or presence of the factor initially and comparing the subsequent incidence of disease in each subgroup. For example, a study of the occurrence of heart attacks in a cohort of nurses who did or did not have high cholesterol at the beginning of an observation period.

Consistency is the extent to which diverse approaches (such as different study designs or populations) for studying a relationship or link between a factor and an outcome will yield similar conclusions.

Controls are a group of study subjects with whom a comparison is made in an epidemiologic study. In a case-control study, cases are persons who have the disease and controls are persons who do not have the disease.

A crossover trial is a research design in which subjects receive a number of treatments in sequence. Generally, this means that all subjects have an equal chance during the trial of experiencing both treatment and placebo dosages without direct knowledge, instead of either placebo or the treatment. Subjects may be transferred directly from one treatment to another or may have a washout period in-between test treatments. This type of trial can be randomized so that not all subjects get the alternative treatments in the same order.

An **epidemiological study** gathers data from large, defined populations.

Intention to treat gives a pragmatic estimate of the anticipated benefit from a change in treatment policy rather than of potential benefit in patients who receive treatment exactly as planned. In epidemiology, an intention to treat (ITT) analysis (sometimes also called intent to treat) is an analysis based on the initial treatment intent, not on the treatment eventually administered. ITT analysis is intended to avoid various misleading artifacts that can arise in intervention research. Full application of intention to treat can only be performed where there is complete outcome data for all randomized subjects (*BMJ* 319:670, 1999).

Meta-analysis is the process of using statistical methods to quantitatively combine the results of similar studies in a systematic review.

Null hypothesis refers to the assumption that there is no difference between two groups, individuals, conditions, or situations that research is addressing. If it is assumed there is no difference and this is shown to be statistically false, this indicates there is a difference. The difference may be due to a treatment or another factor being studied. For example, if a null hypothesis states there will be no difference in a health outcome between a group provided a nutrient and a group not provided the nutrient and the null hypothesis is shown to be false, then this is an indication the nutrient made a difference. This is not proof, and is not an indicator of a specific cause and effect, but is generally one step in the scientific process.

Number needed to treat (NNT) is an indicator of the effectiveness of a therapy. An NNT of one means that every person treated responds to treatment. An NNT of three means for every three people given the treatment, one is expected to respond. An NNT of 20 to 40 can still be considered clinically effective (Guyatt, G., J. Cairns, and D. Churchill. Evidence-based medicine: A new approach to teaching the practice of medicine. *JAMA* 268 (17):2420–2425, 1992.)

Observational studies may be cohort and case-control studies; they may also be follow-up, incidence, longitudinal, or prospective studies. An observational study by its very nature “observes” what happens to individuals. Thus, to prevent selection bias, the comparison groups in an observation study are as similar as possible except for the factors under

study. Establishment of similarity in nutritional status of research participants may be helpful in nutritional and mental health research.

Power refers to the probability of observing an effect in a sample if a specified effect size or greater exists in a population. If a sample is too small, an effect might not be evident, even though the effect actually exists.

Randomized clinical trials (RCT) require that allocation to treatment or control be randomized with the investigator “masked” (or “blinded”) to the subsequently assigned treatment (allocation concealment). This helps to ensure comparability of study groups and minimizes selection bias. While not all controlled studies are randomized, all randomized trials are controlled.

Relative risk (RR) is a measure of how much a particular risk factor (say, cigarette smoking) influences the risk of a specified outcome (say, death by age 70). This specifies the amount of risk that the study indicates an individual might have in (1) contracting the studied condition or (2) having effective treatment from the treatment studied.

Significant refers to relevant or meaningful, or statistical significance, which refers to the probability that an outcome is unlikely to have occurred by chance. A frequent level of significance is $p = .05$, which means 5 times out of 100 the result would have been by chance. Significance is related to the statement of a null hypothesis.

Specificity refers to the proportion of truly non-diseased persons who are identified as such by the screening test; that is, the true-negative rate.

Statistical significance is the probability that an event or difference is real or occurred by chance alone. It does not indicate whether the difference is small or large, important or trivial. The level of statistical significance depends on the number of patients studied or observations made, as well as the magnitude of difference observed. Statistical significance observed in a clinical trial does not necessarily imply clinical significance.

Strength is the size of the estimated risk (of disease due to a factor) and its accompanying confidence intervals. Both of these concepts are directly related to grading the strength of a body of evidence.

Surveys are a quantitative method generally cross-sectional or longitudinal, using questionnaires or structured interviews with the intent of generalizing from the sample to the general population.

Systematic review is an organized method of locating, assembling, and evaluating a body of literature on a particular topic using a set of specific predefined criteria. A systematic review may be purely narrative or may also include a quantitative pooling of data, referred to as a meta-analysis. In a systematic analysis, only those trials which meet a number of pre-set conditions in relation to research design (e.g., sample size, randomization) are included in the final meta-analysis.

Temporality refers to the relationship of time and events such as exposure to a risk factor and the development of disease.

Washout period is the stage in a crossover trial where treatment is withdrawn before a second treatment is given. This is usually necessary to counteract the possibility that the first substance can continue to affect the subject for some time after it is withdrawn.