

GLOSSARY OF TERMS

Term:

Definition:

AAP

The American Academy of Pediatrics. It's an American professional association of paediatricians, dedicated to the health of children.

ACC

Anterior Cingulate Cortex - the frontal part of the cingulate cortex, a region of the brain. It is implicated in several complex cognitive functions, including empathy, emotion, impulse control and decision-making abilities.

Actigraphic

A non-invasive way to monitor human rest and activity cycles, often through body-worn technology containing an actimetry sensor.

Addiction

A brain condition characterised by the compulsive engagement in rewarding stimuli, often with harmful consequences.

Adrenal burnout

Sometimes called 'adrenal fatigue.' Occurs when the adrenal gland produces excessive amounts of hormones. Often results in sleep disorders and other physiological conditions.

Adrenal cortex

Located on the outside of the adrenal gland. The adrenal cortex brings about the stress response.

Adrenaline

Also known as epinephrine. It is a hormone produced in both the adrenal gland and a small number of neurons in the medulla oblongata in the brainstem. Adrenaline is key to certain bodily functions.

Adrenocorticotrophic Hormone (ACTH)

A polypeptide tropic hormone produced in the anterior pituitary gland. ACTH also stimulates the release of the hormone cortisol.

Age-related Macular Degeneration (AMD)

An eye disease that may become progressively worse over time. It's the leading cause of severe, permanent vision loss in people over the age of 60. It occurs when the small central portion of the retina, called the macula, wears down. It has been shown that blue light can cause damage to photoreceptor retinal cells,

	possibly leading to AMD and impaired vision in later life.
Aldosterone	A hormone that plays an important role in regulating blood pressure by acting upon kidney functions and the colon.
Arrestin	A protein that works to keep the melanopsin sensitive to incoming light.
Asynchronisation	Out of synchronisation.
Attention Deficit Hyperactivity Disorders (ADHD)	A group of behavioural symptoms that include inattentiveness, hyperactivity and impulsiveness.
Attention economy	A description of how there's so much information available in the world, it's sometimes difficult to cut through all the information whilst maintaining a normal degree of attention.
Bedtime technology	Many different types of electronic devices that can be used late into the night.
Biochemistry	The chemical processes occurring within and relating to living organisms.
Bergen Insomnia Scale (BIS)	A scale for measuring insomnia. There are six questionnaire items, of which the first three pertain to sleep onset, maintenance, and early morning wakening insomnia, respectively. The last three items refer to not feeling adequately rested, experiencing daytime impairment, and being dissatisfied with current sleep.
Blue light	A colour in the visible light spectrum that can be seen by human eyes. Blue light is a short wavelength, which means it produces higher amounts of energy. Many modern-day electronic media screens have blue light emissions.
The Canadian Paediatric Society	A Canadian association of paediatricians, committed to working together to advance the health of children and youth by nurturing excellence in health care, advocacy, education and research.
Compact Fluorescent Light bulb (CFL)	A fluorescent lamp designed to replace incandescent light bulbs. The lamps use a tube which is curved or

folded to fit into the space of an incandescent bulb. They are far more energy-efficient than the older incandescent filament lightbulbs.

Chronic	Something that is persisting for a long time or constantly recurring.
Chronobiology	A field of biology that examines periodic phenomena in living organisms and their adaptation to both solar and lunar-related rhythms, known as biological rhythms. One such biological rhythm is our circadian rhythm.
Chronopharmacology	The study of the effects of biological rhythms on drugs.
Chronotherapy	A behavioural therapy treatment where a person's sleep times are systematically delayed or brought forward to an earlier time. It was originally developed to treat people who suffered with delayed sleep onset by gradually delaying their sleep time until their circadian rhythm reached an optimal balance and they slept normally.
Chronotype	Describes whether a person is a morning person or a night owl. It is possible that our own chronotypes are influenced genetically and passed down from our ancestors.
Circadian rhythm	Our body's internal body clock. It's the very reason why we fall asleep each night and awake in the mornings and why our bodies will generally feel tired or sleep around the same time each day, when averaged out over a long period. Our circadian rhythm doesn't just exert control over our sleeping patterns, they also cause changes in our behaviour, control our levels of alertness, thermoregulation in the body and hormone production.
Circadian Rhythm Sleep Disorders (CRSD)	These are sleeping disorders typified by insomnia, excessive daytime somnolence, or both. The treatment of CRSD depends very much on the cause which must first be identified. It does typically resolve itself when the circadian rhythm realigns itself with the natural light/darkness cycle.

Clinical Research	This is a branch of research that develops new treatments and furthers knowledge in a specific field within healthcare. The research involves human subjects.
Cognitive functioning	A catchall term used to define the brain's ability to function in areas involving for example, mental reasoning, problem solving, decision making, memory recall, comprehension, judgement and attentiveness.
Cold turkey	The cessation of a substance that a person has become dependent upon. These are the unpleasant symptoms of that sudden withdrawal from that substance.
Comorbid sleep disorders	Sleep disorders existing simultaneously with and usually independently of another condition.
Cones	Photoreceptor cells in the retina of the eye. They react to different wavelengths of light and function better to brighter light, as opposed to rods which respond better in dim light. They perceive the colour spectrum for us.
Corticotropin Releasing Hormone (CRH)	CRH is a peptide hormone involved in stress responses. A release of CRH stimulates the synthesis of ACTH from the pituitary gland, which then triggers a response in the adrenal cortex. This is a very essential mechanism in the regular functioning of the body.
Cortisol	Cortisol is known as the 'stress hormone.' It's produced in the adrenal gland and partly responsible for waking us up each morning.
CREST	CREST is the British Science Association's scheme for STEM project work that inspires young people to think and behave like scientists and engineers.
Cronbach's alpha	Cronbach's alpha is a statistical model that is used as a measure of internal consistency, to see how closely related a set of items are as a group.
Cross-functional	Relates to the multi-functional use or purpose of a device and how they can be used for several different things.

Cryptochrome	A pigment found in ganglion cells. They are particularly sensitive to blue light and involved in circadian rhythms.
Data sample	A set of data that has been collected.
Daytime attentiveness	A person's ability to remain attentive and pay close attention during the daytime.
Daytime dysfunction	A person's inability to function either physically or mentally, to their normal level of functioning, during the daytime.
Daytime inattentiveness	A person's inability to remain attentive and pay close attention during the daytime.
Deep sleep phase	This is Stage 3 of NREM sleep, also known as the 'slow wave sleep' phase. It's the sleep stage where all memories from the day are consolidated and processed. It's the restorative deep sleep phase that helps regeneration and recuperation of the body and the cognitive processes.
Delayed sleep onset	A gradually delayed sleep time.
Delta waves	A change in brain waves as they slow down and increase in amplitude during Stage 3 of NREM sleep (deep sleep phase).
Department for Education	A UK government department, responsible for child protection, education, apprenticeships and wider skills in England.
Department for Health & Social Care	A UK government department, responsible for government policy on health and adult social care matters in England.
Digital native	A person who has been brought up during the age of digital technology and very familiar with computers and other electronic media.
Displacement	When something has moved from its previous position.
Diurnal	Related to the time period of a day.

Diurnal Type Scale	A Likert-type scale constructed by Torsvall & Åkerstedt in 1980, for the purpose of establishing whether survey respondents had a morning or evening disposition.
DLPFC	Dorsolateral Prefrontal Cortex - an area in the prefrontal cortex of the brain. Involved in cognitive control and emotions.
Dopamine	Both a hormone and a neurotransmitter that's used in circadian rhythms. In popular culture, dopamine is seen as the main chemical of pleasure, cravings and desire and often associated in the media with consumption of chocolate.
EEG	Stands for 'electroencephalogram.' It's a test used to monitor electrical activity in the brain.
Electronic media	All media that uses electronics for the end user to access the content.
Et al.	A scholarly abbreviation of the Latin phrase <i>et alia</i> , which means, ' <i>and others.</i> '
Extremely Low Frequency (ELF)	ELF is electromagnetic radiation with frequencies from 3 to 30 Hz, and corresponding wavelengths of 100,000 to 10,000 kilometres.
Epidemiological studies	The study of diseases in populations of humans or other animals, specifically how, when and where they occur.
Epinephrine	Another name for adrenaline.
eReader	An electronic reading device, for example, a Kindle.
Eveningness	An individual's preference for alertness in the evening and night-times.
Evening typed	Another name for eveningness.
Fight-or-flight response	This is a physiological reaction that occurs in response to a perceived harmful event. The adrenaline is released to make your body respond a lot quicker to the situation. This is when an adrenaline rush occurs.

Ganglion cells	Neurons in the retina. They help convey information from other retinal neurons to the rest of the brain.
Gateway drug	A drug which supposedly leads the user on to more addictive or dangerous drugs.
GMV	Grey Matter Volume. Grey matter areas of the brain contain most of the brain's neural cells. These regions are involved in muscle control, sensory perception and decision-making. The density of cells (volume) in a particular region of the brain appears to correlate positively with various abilities and skills. For example, in this research study I have looked at positive correlations between GMV, sleep and academic performance.
Habitual	Something done constantly or as a habit.
Helsinki Declaration	The World Medical Association (WMA) developed the Declaration of Helsinki in 1964, as a statement of ethical principles for medical research involving human subjects, including research on identifiable human material and data.
Hippocampus	A complex brain structure embedded deep in the temporal lobe of each cerebral cortex. It is an important part of the limbic system, a cortical region that regulates motivation, emotion, learning, and memory.
Homogeneous	An adjective denoting that something is the same throughout.
Human Growth Hormone (HGH)	A peptide hormone that stimulates growth, cell reproduction, and cell regeneration in humans and other animals.
Hypertension	High blood pressure.
Hypothalamus	A small region of the brain, located at the base, near the pituitary gland. The hypothalamus plays a crucial role in many important functions.
Hypnic jerks	A brief and sudden involuntary contraction of body muscles occurring when a person is beginning to fall asleep, often causing the person to jump and awaken suddenly for a moment.

Infradian	Long-term body rhythms lasting longer than 24 hours in duration.
Insomnia	A sleep disorder where people have extreme difficulty in getting to sleep or staying asleep for long enough to feel refreshed the next morning.
Intrinsically photosensitive retinal ganglion cells (ipRGCs)	Also known as photosensitive retinal ganglion cells, or melanopsin-containing retinal ganglion cells. They are a type of neuron in the retina of the eye. They respond to light in the absence of all rod and cone photoreceptors.
IRAS	Integrated Research Application System. It's a single system for applying for the permissions and approvals for health and social care / community care research in the UK.
K complexes	Waveforms that may be seen on an electroencephalogram (EEG). They occur during stage 2 of NREM sleep. They are a mechanism by which the brain protects itself from sudden awakening.
Kruskal-Wallis test	Sometimes also referred to as the ' <i>one-way ANOVA on ranks test</i> ', is a rank-based nonparametric test that can be used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable.
L.E.D.	Light emitting diode.
Likert-type scale	A linear rating scale found on survey forms, that measures how people feel about something.
Luminosity	An absolute measure of radiated electromagnetic power (light).
Lux	A unit of illuminance, measuring luminous flux per unit area. It is equal to one lumen per square metre.
Medial PFC	Medial Prefrontal Cortex, a region of the brain. Most of the medial frontal cortex is involved in attention.
Medulla oblongata	A long stem-like structure which makes up part of the brainstem.

Melanopsin	A photopigment protein, found primarily in the intrinsically photosensitive retinal ganglion cells (ipRGCs) of the retina at the back of our eyes. The melanopsin in these cells helps them to process levels of ambient light and relay this as signals to aid the circadian rhythm in the body.
Melatonin	A hormone that plays a very important role in the body's circadian rhythm cycle. It is produced in the pineal gland in the brain and synthesised in response to stimulus from light and darkness.
Monochromatic	A light of a single wavelength or frequency. Monochromatic colours are all the colours of a single hue.
Morningness	An individual's preference for alertness in the morning, as opposed to eveningness where they are prone to be more alert in the evenings.
Morning typed	Another name for morningness.
Morphometry	The quantitative analysis of matter, encompassing size and shape.
MRC	The Medical Research Council. Responsible for co-ordinating and funding medical research in the United Kingdom.
MRI	Magnetic resonance imaging (MRI) is a type of scan that uses strong magnetic fields and radio waves to produce detailed images of the inside of the body.
NASA	The National Aeronautics and Space Administration.
National Sleep Foundation	A US-based organisation created to promote public understanding of sleep and sleep disorders. It seeks to improve public health and safety by supporting sleep-related education, research, and advocacy.
Neuron	A cell that carries electrical impulses. Neurons are the basic units of our nervous system.
Neuropeptides	Small protein-like molecules used by neurons to aid the flow of communication between one another.

Neurophysiology	A branch of physiology and neuroscience that is concerned with the study of the functioning of the nervous system.
Neuroscientist	A scientist who has specialised knowledge in the field of neuroscience, the branch of biology that deals with the physiology, biochemistry, anatomy and molecular biology of neurons and especially their association with behaviour and learning.
Neurotoxins	Toxins that are destructive to nerve tissue.
Neurotransmitter	A type of chemical messenger which transmits signals across a chemical synapse from one neuron (nerve cell) to another neuron, muscle cell, or gland cell.
NHS	The National Health Service (NHS). Established in the U.K. in 1948 as one of the major social reforms since the Second World War. The founding principles were that services should be comprehensive, universal and free at the point of delivery.
Night Shift	A screen setting on iPhones and iPads that shifts the on-screen colour that you see from the shorter wavelength blue light to a longer wavelength yellow light. This cuts down on the melatonin-suppressing blue light exposure.
Night terrors	Episodes of screaming, intense fear and flailing while still asleep.
NREM sleep	Non-rapid eye movement sleep, consisting of sleep stages 1–3. There are distinct characteristics in each individual sleep stage.
Objective	Independent from individual subjectivity caused by perception, emotions, personal feelings or opinions or imagination. Something that is factually accurate.
Oestrogen	The primary female sex hormone. Responsible for the development and regulation of the female reproductive system and secondary sex characteristics.
Opsin	A protein which forms part of the visual pigment rhodopsin and is released by the action of light.

Pavlov's Dog	Classical conditioning, originally undertaken in experiments using dogs by the Russian physiologist Ivan Pavlov during the 1890s when researching salivation in dogs in response to being fed.
Pearson's Correlation Coefficient	Also referred to as Pearson's r , the Pearson product-moment correlation coefficient or the bivariate correlation, is a measure of the linear correlation between two variables. In other words, the strength of the association between two given variables.
Period gene	A section of DNA which has an affect on circadian rhythms and determines the period length of circadian and ultradian rhythms.
Phase Response Curve (PRC)	The curve describing the relationship between light exposure (the stimulus) and a shift in the circadian rhythm (the response).
Photopic lux	Describes an average response of the colour vision receptors (cones). A candle at 1 meter distance gives 1 photopic lux of light. Typical room illumination is in the order of 300-500 lux, whereas outdoor light varies from 1500 lux on a cloudy day to 100000 lux on a sunny day.
Photoreception	The mechanisms of light detection that lead to vision and depends on specialised light-sensitive cells called photoreceptors, which are located in the eye.
Pilot test	A small scale preliminary test conducted in order to evaluate feasibility, duration, ensure face validity and improve upon the study design prior to launching the full-scale research project.
Pituitary gland	A small gland that plays a major role in regulating vital body functions and general wellbeing. It controls the activity of most other hormone-secreting glands.
Polysomnography (PSG)	A sleep study, used to diagnose sleep disorders. It records brain waves, the oxygen level in blood, heart rate and breathing, as well as eye and leg movements.
Precuneus	A brain region on the medial surface of each brain hemisphere, involved in a variety of complex functions. It is located in front of the cuneus (the upper portion of the occipital lobe).

Prefrontal cortex	A region of the brain that has been implicated in complex cognitive behaviour, personality, decision making, and moderation of social behaviour.
Progesterone	A hormone released by the corpus luteum in the ovary. It plays important roles in the menstrual cycle and in maintaining the early stages of pregnancy.
PSQI	Pittsburgh Sleep Quality Index. A self-reported questionnaire that assesses sleep quality over a 1-month time period. The measure consists of 19 individual items, creating 7 components that produce one global PSQI score.
Psychophysiological arousal	Something that stimulates our physiological, emotional or mental states.
Quantitative analysis	Analysis of quantifiable information by means of complex mathematical and statistical modelling.
Qualitative analysis	Subjective analysis based on non-quantifiable information.
RCPCH	Royal College of Paediatrics & Child Health, the professional body for paediatricians in the United Kingdom.
REC	NHS Research Ethics Committee. They review research applications and give an opinion about whether the research is ethical. There are more than 80 NHS Research Ethics Committees across the UK. They exist to safeguard the rights, safety, dignity and well-being of research participants.
REM sleep	Rapid eye movement sleep. The 4 th stage of sleep. It's a unique phase of sleep, distinguishable by random/rapid movement of the eyes.
Reactive oxygen species	A type of unstable molecule that contains oxygen and that easily reacts with other molecules in a cell. A build-up of reactive oxygen species in cells may cause damage to DNA, RNA, and proteins.
Respondent	A person who replies to something, especially one supplying information for a questionnaire.

Retina	A thin layer of tissue that lines the back of the eye on the inside. It is located near the optic nerve. The purpose of the retina is to receive light that the lens has focused, convert the light into neural signals, and send these signals on to the brain for visual recognition.
Rhodopsin	Pigment found in the rods of the retina. Extremely sensitive to light and enables vision in low-light conditions.
Rods	Photoreceptor cells in the retina of the eye. They react to different wavelengths of light and function better in less intense light, as opposed to cones which respond better in more intense light. They are used in our peripheral vision.
S.A.D. (Seasonal Affective Disorder)	A type of depression that recurs on a seasonal basis. It is most likely triggered by the lack of sunlight in winter, which affects levels of hormones.
Serotonin	A neurotransmitter produced in the pineal gland of the brain. Serotonin plays an important role in the promotion of sleep because it is synthesised by the pineal gland to make melatonin.
Sleep apnoea	A serious condition where the muscles in the throat relax during sleep causing the sufferer to temporarily stop breathing whilst they sleep.
Sleep Cycle	Whilst we sleep our heart rate and body temperature decrease and our brains undergo significant changes in brain wave activity. This produces the varying stages of sleep that our bodies undergo on a daily basis. It's a cyclical event. To have peaceful and undisturbed sleep, a sleeper must go through the four stages of the sleep cycle and generally complete several sleep cycles per period of sleep. These four stages are split into Non-REM (NREM) sleep and REM sleep.
Sleep debt	The cumulative effect of not getting enough sleep in a given time period. A large accumulation of sleep debt may lead to mental or physical fatigue.
Sleep deficit	Another term for 'sleep debt.'

Sleep displacement	When sleep is displaced to a later time due to other activities or distractions occurring. As a result of the absence of time boundaries when using electronic media around bedtime, it is more likely to lead to time displacement.
Sleep environment	The area where a person sleeps. It includes not just physical aspects like the bedding but also things like room temperature, air flow, etc.
Sleep inertia	Where a person feels very sluggish for the rest of the day, especially after a person has been awoken during their REM stage of the sleep cycle.
Sleep latency	Another term for 'Sleep Onset Latency.'
Sleep Onset Latency (SOL)	Also called 'Sleep Latency.' It's the amount of time it takes a person to go from being fully awake to sleeping. It may be compounded by the use of mobile phones, extending waking hours further into the night to enable the furthering use of the mobile phone.
Sleep spindles	Waveforms that may be seen on an electroencephalogram (EEG). They occur during stage 2 of NREM sleep. They are a mechanism by which the brain protects itself from sudden awakening.
Sleep stratigraphy	The different layers of sleep in the sleep cycle.
Sleep/wake cycle	Another term for 'sleep cycle.'
Slow wave sleep	Stage 3 NREM sleep. The sleep stage where all memories from the day are consolidated and processed. It's the restorative deep sleep phase that helps regeneration and recuperation of the body and the cognitive processes.
Social jet lag	A temporary disturbance of circadian rhythms as a result of social activities.
Socio-psychological studies	The scientific study of how people's thoughts, feelings, and behaviours are influenced by the actual, imagined or implied presence of others.
Solid-state lighting (SSL)	A bichromatic light created by mixing a blue light LED with a yellow phosphor which has a peak emission

	around 580 nm. To the naked eye, this bichromatic light appears white in colour.
Somnolence	A state of strong desire for sleep, or sleeping for unusually long periods.
Spectral range	The wavelength range.
Subjective	Something based on or influenced by personal feelings, tastes, or opinions and not scientific facts.
Stepwise Multivariate Linear Regression Analysis	A method of regressing multiple variables while simultaneously removing those that aren't important. Essentially it does multiple regressions a number of times, each time removing the weakest correlated variable. It is used to measure the degree at which multiple independent variables (predictors) and more than one dependent variable (responses), are linearly related.
Suprachiasmatic nucleus (SCN)	A network of smaller oscillators based in the hypothalamus in the brain, that functions as the master controller in the circadian rhythm process.
Synchrony effect	Describes what happens when your circadian rhythm is at its peak and you're feeling very alert. During this state your academic performance will most likely also be at its peak.
Temporal desynchrony	A term I created to describe how the circadian rhythm is out of synchrony through time displacement.
Testosterone	The primary male sex hormone. In male humans, testosterone plays a key role in the development of male reproductive tissues.
Thermoregulation	A process that allows the body to maintain its core internal temperature.
Time and Motion Study	A business efficiency technique assessing what motions or activities are undertaken in given time periods.
Time Shifting	The process where use of bedtime technology displaces sleep to a later bedtime and as a result, a later awake time occurs the following morning.

Total Sleep Time (TST)	The amount of actual sleep time in a sleep period. Equal to the total sleep episode less the awake time.
<i>t</i> - Test	Used to establish if the correlation coefficient is significantly different from zero, and, hence that there is evidence of an association between the two variables. In other words, how statistically significant the association is between the variables.
Ultradian	Body rhythms lasting under 24 hours. Examples are heart beats, respiration and eyes blinking. These are things that a person generally has little conscious control over and they're all vital functions in the body.
Uses and Gratifications Theory (UGTtheory)	This theory states that people deliberately and consciously consume different types of media in order to satisfy specific needs.
VBM	Voxel-Based Morphometry - a scan that provides a comprehensive assessment of anatomical volume differences throughout the brain without bias towards any specific region.
Voxel	A measurement, like a pixel in three-dimensional space.
WHO	World Health Organisation, a specialised agency of the United Nations that is concerned with international public health. It was established in 1948.
Zeitgeber	An external or environmental cue that helps synchronise our circadian rhythms to the natural 24-hour light/dark cycle.
Zeitgeist	The general mood or quality of a particular period of history, as shown by the ideas, beliefs, etc. common at the time.