A CROSS SECTIONAL STUDY ON SLEEP AMONG INDIANADOLESCENTS

A dissertation submitted to the Tamil Nadu Dr. MGR Medical University, Chennai for MD Degree in Paediatrics

April 2016

CERTIFICATE

This is to certify that the dissertation titled **"A CROSS SECTIONAL STUDY ON SLEEP AMONG INDIAN ADOLESCENTS"** is the bonafide work done by **Dr. Sataroopa Mishra** in the Department of Paediatrics, Christian Medical College and Hospital, Vellore towards partial fulfillment of the degree of MD Paediatricsfor the examination of The Tamil Nadu Dr. M.G.R. Medical University, Chennai,Tamilnadu, to be held in April 2016.

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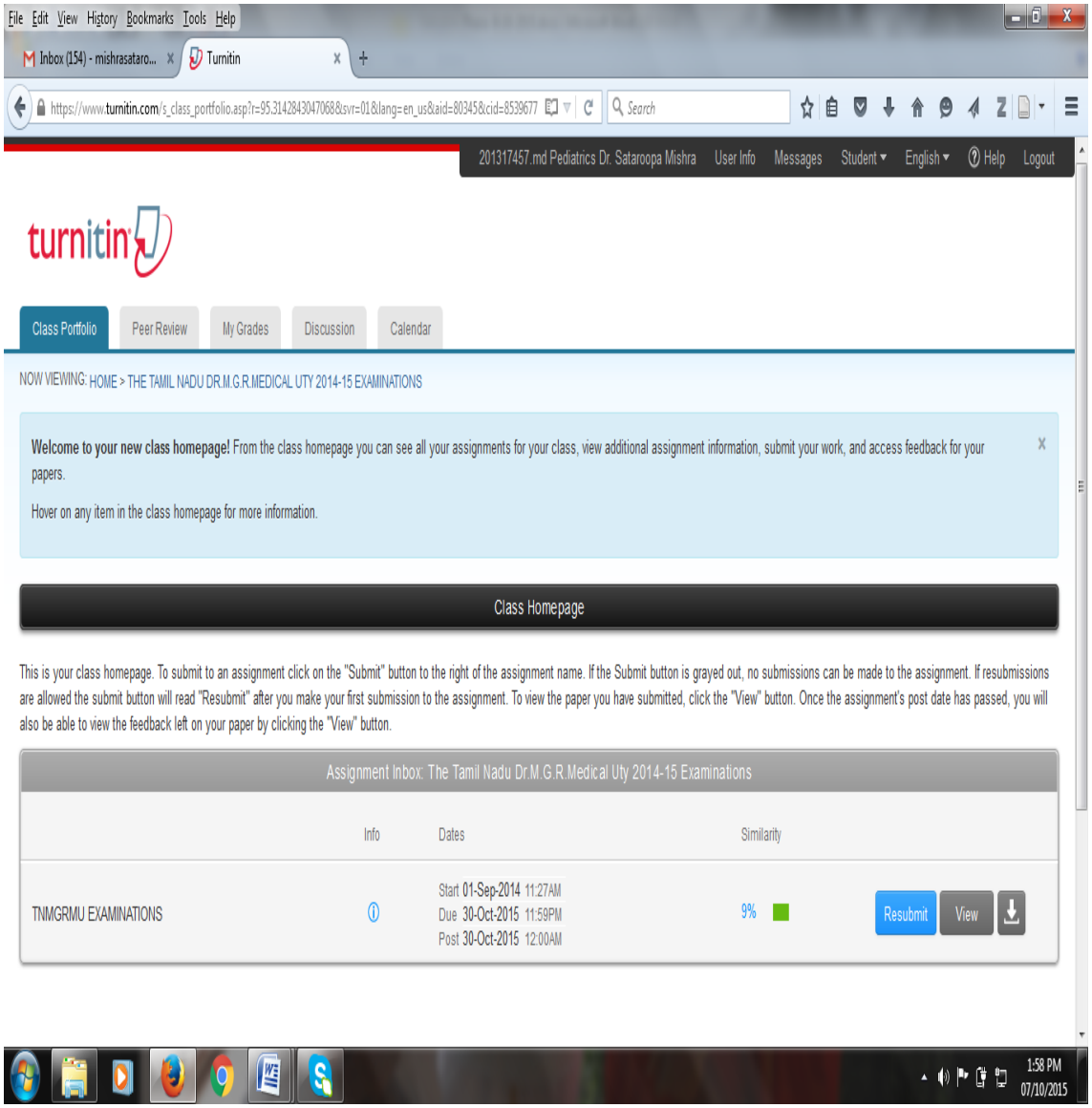
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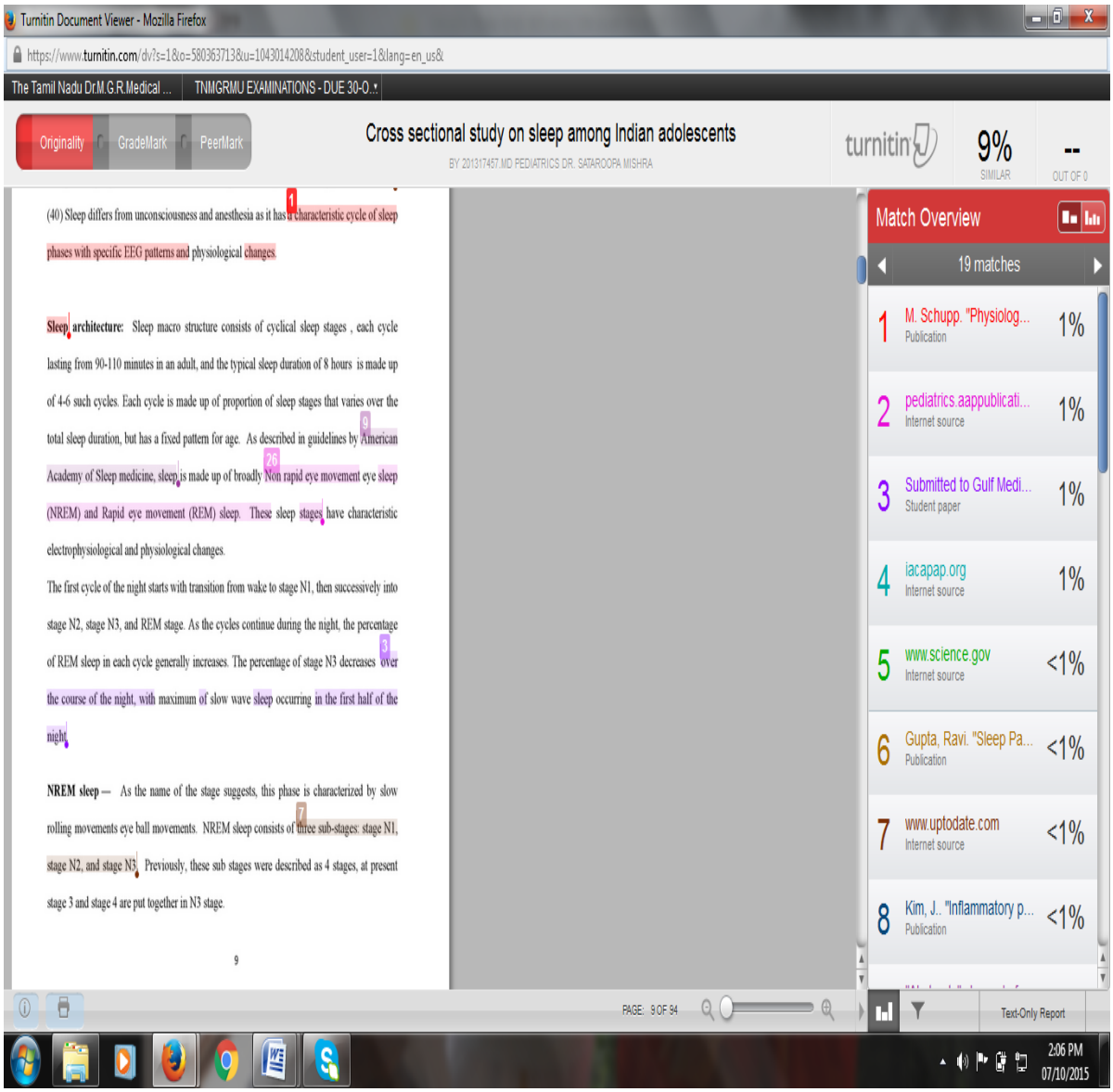
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(40) Sleep differs from unconsciousness and anesthesia as it has a characteristic cycle of sleep phases with specific EEG patterns and physiological changes.
Sleep architecture: Sleep macro structure consists of cyclical sleep stages , each cycle lasting from 90-110 minutes in an adult, and the typical sleep duration of 8 hours is made up of 4-6 such cycles. Each cycle is made up of proportion of sleep stages that varies over the total sleep duration, but has a fixed pattern for age. As described in guidelines by American Academy of Sleep medicine, sleep is made up of broadly Non rapid eye movement eye sleep (NREM) and Rapid eye movement (REM) sleep. These sleep stages have characteristic electrophysiological and physiological changes.
The first cycle of the night starts with transition from wake to stage N1, then successively into stage N2, stage N3, and REM stage. As the cycles continue during the night, the percentage of REM sleep in each cycle generally increases. The percentage of stage N3 decreases over the course of the night, with maximum of slow wave sleep occurring in the first half of the night.
NREM sleep – As the name of the stage suggests, this phase is characterized by slow rolling movements eye ball movements. NREM sleep consists of three sub-stages: stage N1, stage N2, and stage N3. Previously, these sub stages were described as 4 stages, at present stage 3 and stage 4 are put together in N3 stage.
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Match Overview
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ABSTRACT

Title: A cross sectional study on sleep among Indianadolescents

Department: Department of Paediatrics, Christian Medical College, Vellore

Name of the candidate:Sataroopa Mishra

Degree and Subject: MD Paediatrics

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Background: Adolescence is an important stage in the life of an individual. Good sleep hygiene is as essential for an adolescent as a well balanced diet and adequate exercise. However, sleep deprivation is an important public health problem during adolescence. Several studies have demonstrated the negative effects of acute and chronic sleep insufficiency in adolescents. Sleepiness in adolescents and young adults affects their academic performance, mental health, cardiovascular health and safety on the road. Our study aims to analyze the level of sleep insufficiency in our adolescents and related sleep problems.

Objective: To study the sleep pattern, assess sleep quality, sleep hygiene and determine sleepiness levels amongst school going adolescents in Vellore, south India using a self reported questionnaire

Setting: Community based school survey in a semi-urban setting among 9th and 11th grade students in three schools in Vellore city.

Methods: This study is a questionnaire based study. Adolescents were asked to mark the responses to the various questions in the questionnaire. Some of the questions enquired into standard sleep parameters viz. weekday and weekend bedtime, wake-time and night total sleep time. Standardized questionnairesvalidated among adolescents in other countries including, Adolescent Sleep Wake scale (ASWS) to assess sleep quality, Adolescent Sleep Hygiene Scale (ASHS) to assess sleep hygiene practices and Epworth sleepiness scale to determine sleepiness levels in adolescents were used.

Results: The total number of participants included 257 students. Mean age of the students in this study was 14.5 years. On week days, the average bed time reported was 9:39 pm ±44 min and average wake time 6:20 am ± 56 min. During the weekend, the mean bedtime was 9:53 ± 49 pm and wake time 7:03 am ± 88 min. Wake time during weekends was about 43 minutes later than wake time during weekdays. The average total night sleep duration during weekdays was 8 hours and 40 min ± 64 min. On weekends it was 9 hours and 10 min ± 81 min. There was difference of 30 minutes for total sleep duration, between weekends and weekdays. About 12% of our participants reported daytime sleepiness which had weak to moderate inverse relationship to sleep quality (r= - 0.30) and sleep hygiene (r= -0.23).

Our study population showed a good quality of sleep mean total score of 4.25 on a scale of 1-6). Overall, the students reported good sleep hygiene practices (mean total score =4.29). Relationship between sleep quality and sleep hygiene was moderate to strong (r=0.63). Adolescents reported low scores in cognitive (mean=3.72) and sleep stability domains (3.79). .

Conclusions: Sleep parameters were comparable to those observed in other parts of world. Adolescents in our study population have reported a reasonably good quality of sleep and sleep hygiene practices. Sleep hygiene has a good relationship with sleep quality. Use of electronic media close to bed time and not following a regular sleep schedule affect the sleep quality in our population.

INTRODUCTION:

Adolescence is an important stage in the life of an individual. It is a relatively healthy period. Adolescents no longer have infectious diseases characteristic of the under five children. Adulthood diseases like the metabolic syndrome have not yet set in. Good sleep hygiene is as essential for an adolescent as a well balanced diet and adequate exercise. A good sleep enables an adolescent to perform well in academics, sports and other extracurricular activities. Research has shown that inadequate and poor quality sleep can result in mental illness, overweight and obesity and even cardiovascular diseases in the future(1–20).

A number of physical changes occur during adolescence including changes in the region of the brain controlling sleeping (21,22). Simultaneously, teenagers are required to take up increasingly newer social roles and responsibilities. To further complicate, the immense pressure to perform well in academics and peer pressure in different domainsresult in a drastic change in the sleep pattern and sleep quality. Sleep related behavior established during the teenage years continues to persist in adulthood. It is therefore imperative to establish healthy sleep practice during adolescence and even in childhood. Studies in several parts of the world have demonstrated that teenagers are having poor sleep quality, which in turn contributes to increasing school absenteeism, road traffic accidents, substance

abuse and depression.(13). Our aim in this study is to observe the sleep patterns and problems among school going adolescents in our community.

AIMS AND OBJECTIVES

Aim:

To study the sleep patterns, sleep quality and sleep hygiene of school going adolescents in Vellore

Objectives:

Using a standardized questionnaire:

1) To study sleep patterns among school going adolescents in Vellore

2) To assess their sleep hygiene.

3) To assesstheir quality of sleep.

4) To determine thelevel of daytime sleepiness they have.

5) To study therelationship between sleep hygiene practices and sleep quality.

6) To study the relationship betweendaytime sleepiness, sleep hygiene and sleep quality.

REVIEW OF LITERATURE:

Introduction:

Sleep is a physiological phenomenon that is influenced by the scientific advancement and cultural practices of a society. In different periods in history, man's knowledge and idea about sleep as well as his sleep habits have undergone paradigm changes.

Sleep was described by the Greek philosopher and medical theoristAlcmaeon of Croton in the 5th century. He stated in his vascular theory that sleep occurred when blood filled the brain and waking was the result of blood returning to the rest of the body. In 400 BC, Androsthenes of Thasus, a ship captain under Alexander the Great, travelled to North Africa and India and made observations on the tamarind tree. He noted that thetamarind leaves revealed an impressive movement up during the day and down during the night as a daily cycle. In 1598 ADWilliam Shakespeare described certain symptoms in characters of his play which were suggestive of obstructive sleep apnea.(23)

Discovery of newer technologies gave the impetus to research in the field of sleep. In 1929, German Psychiatrist Hans Berger discovered Electroencephalogram which was used to see brain's activity during wakefulness

and sleep. Soon, in 1937, sleep stages were described by Alfred Loomis and colleagues and in 1953, REM (Rapid eye movement) sleep was discovered(23).

One of the earliest recommendations for sleep was proposed by Napolean Bonaparte in 1709 when he said“6 hours sleep for a man, 7 for a woman and 8 for a fool”; he suffered from insomnia, sleeping 4 hours at night and taking half hour naps to energize himself(24). By 1800, as the Western society entered the Industrial age, sleeping more than 8 hours was considered a sign of laziness.(23)Soon, sleep deprivation started surfacing as a problem in the society. In 1895, Prime minister of England, the Earl of Rosebery resigned due to chronic insomnia. (23) In 2004, Charles A. Czeisler et a professor in Harvard medical school reported medical errors occurring due to sleep deprivation among doctors(25). Sleep deprivation was thus recognized as a major public health problem.

Adolescence is a unique transitional stage between a dependent childhood to an independent adulthood. Pubertal changes in the body as well as changes in the social roles and responsibilities are characteristic of adolescence. These can in turn causesignificant alterationin cognitive, social, behavioral and emotional functioning in young people.Several changes occur in the circadian rhythm and sleep regulatory mechanisms during adolescence.Maturational changes take place in the sleep–wake cycle, sleep timing, duration and architecture. Some of

these changes persist in adulthood(26). Sleep is an essential part in the growth and development of an adolescent.(21)

There are several myths and beliefs regarding ideal sleep. An age old proverbial saying mention, ‘Early to bed, early to rise makes one healthy and wise’. Fact is, adolescent sleep behavior is quite contrary to this saying. They tend to sleep later at night and wake up later in the morning due to a shift in circadian rhythm during adolescence.(26,27). Contrary to the popular belief, sleep requirement remains the same as during childhood.(27) On the other hand,there is an expectation to excel in academics and sports and an apparent inability on the part of the adolescent to keep time. This kind of mismatch in adolescent sleep requirements and socialdemands might cause turmoil within families. In the west where adolescent sleep has been studied extensively, policies and recommendations have been laid for school timings in concordance with the biological rhythm of adolescent sleep pattern. (28) Their findings have not translated to recommendations for adolescents in India.

Several studies have reiterated that adolescents in general are deprived of a good quality and quantity of sleep(10,13,29–32). Poor sleep quality and quantity affect academic performance and learning, results in increased school absenteeism, higher rates of substance abuse, road traffic accidents and depression.(2,13,33–36). Indian studies have revealed that adolescents here are sleep deprived and are not different from adolescents from the rest of the world.(29,37)Sleep deprivation therefore is an

important health issue to be addressed.This study is a step to fulfill the need for health care professionals to research sleep pattern among Indian adolescents.

Epidemiology: Research from around the world has noted that adolescents do not sleep adequately and have a high level of sleepiness (29,30,37–47)Studies conducted in USA, Germany, Italy and Australia reveal that teenagers suffer significantly from a lack of sleep.(38)(31)(48)

A self reported survey of 4000 students in China revealed that 50% of adolescents did not sleep sufficient hours during weekdays.(43)Korean 10-12thgraders slept 6 hours on an average, much less than the recommended 9 -10 hours of sleep for adolescents.(45)(49)

Excessive daytime sleepiness is a widely used indicator for sleep inadequacy in adolescents. One third of senior high school students in Taiwan suffered from daytime sleepiness.(50)There is a lack of standardized tools for measuring sleepiness across different populations. Studies done all in several using Epworth Sleepiness Scale revealed 16 – 42 % in adolescents in Asia, North America and Europe. Asian adolescents reported much lesser hours of total night sleep compared toEuropean and North American counterparts.(51)

Age and sleep pattern:

Adolescents in higher grades have lesser total sleep time and higher daytime sleepiness with 10-12th graders suffering from maximum sleep loss (31,37–39,43,45)sIn surveys done in North America, Europe, China and Australia, one third of the adolescents had less than the recommended 9 hours of sleep and a majority of these were 15-16 years.(51)

An accumulated loss of sleep on weekdays results in longer periods of sleep during weekends. This sleep debt is indicated by a difference in duration of sleep during weekends and weekdays.(37,39,43,45)

Studies from India reveal a similar situation as in the rest of the world. In 1920urban school going adolescents in Delhi slept about 7.8 hours a day. Daytime sleepiness was as high as 50 % amongst 12 graders in this population.(37) In Gujaratadolescents who slept less than 7 hours a day had a higher level of adiposity as well as cardiovascular reactivity. (1) More research is needed to understand the magnitude of the problem among urban and rural adolescents and within different social strata.

Sleep loss and quality of sleep are influenced by culture. In a comparative study between American and Italian adolescents, the latter group was noted to have a better sleep quality which was explained by better sleep hygiene in the Italian group. (52) A study on sleep habits among Australian and American adolescents revealed that on an

average Australians slept 47 minutes more as compared to Americans This was secondary to cultural differences between the two societies. A larger proportion of Australian adolescents had their bedtime set by parents, the school starting later and lesser involvement in extracurricular activities(53). Sleep deprivation among adolescents is a rising global public health problem requiring the attention of health care professionals.American Medical Association and the American Academy of Sleep Medicine recognized sleep insufficiency among adolescents as a serious issue in 2010.(39) The consequences of sleep insufficiency are grave that results in poor academic performance, mood disorders, cardiovascular morbidity, obesity and increased road traffic accidents(13).The US department of Health and Human services included 'Sleep Health' as one of the goals in their initiative called 'Healthy People 2020'. One of the objectives of this initiative is to increase the proportion 9-12 grade students having sufficient sleep. Sleep insufficiency in adolescents is a public health problem.(54)

Physiology of Sleep:

Sleep is a rapidly reversible state of reduced responsiveness, motor activity and metabolism. (55) Sleep differs from unconsciousness and anesthesia in that it has a characteristic cycle of sleep phases with specific EEG patterns and physiological changes such as oculomotor activity limb movements etc(22).

Sleep architecture:

Sleep macrostructure consists of cyclical stages, each cycle lasting 90-110 minutes in an adult. A typical sleep duration of 8 hours is made up of 4-6 such cycles. Duration of each of these sleep stages varies during the total sleep period, but has a fixed pattern which varies as per age(26). Sleep is made up of non rapid eye movement eye sleep (NREM) and rapid eye movement (REM) sleep. NREM is further divided into 3 stages, N1, N2 and N3. Each of these stages of sleep havecharacteristic electrophysiological and physiological changes.

The first cycle of the night starts with transition from wake to N1stage, then successively into stages N2, N3 and REM. There are subsequent cycles throughout the night. As consequent cycles progress, percentage of REM in subsequent cycles increases. Percentage of N3 decreases over the course of night, with maximum slow wave sleep occurring in the first half of the night.

NREM sleep: As the name suggests, NREM is characterized by slow rolling eye ball movements. NREM was described with 4 stages earlier. Currently stages 3 and 4 are combined as N3.

Stage N1: It is a transition from wakefulness to sleep. It accounts for 5- 10% of total sleep time in young adults (55). It is characterized by low amplitude EEG waves of 4 – 7- Hz. A person can be easily aroused from this stage.

Stage N2: Itforms the largest percentage of total sleep time in an well adult, about 45 - 55 % of the night. Frequency reduces and amplitude increases. This stage is characterized by sleep spindles and K-complexes.

●Sleep spindles are of short duration, 0.5 seconds, with a frequency of 11-16 Hz.

●K-complex is a well-delineated, negative, sharp wave immediately followed by a positive component that stands out from the background EEG and has a total duration of ≥0.5 seconds.

Stage N3: This stage is known as “deep sleep” or “slow wave sleep.” It is characterized by low frequency (0.5 to 2 Hz), high amplitude delta waves with an amplitude >75 microvolts.N3 typically forms 10 - 20 % of the total sleep time in young to middle age adults and decreases with age. N3 occurs in the first half of the night and particularly at the beginning of the night. It is more difficult to arouse a person from N3 than from stages N1 and N2.

REM Sleep(Stage R): REM is characterized by conjugate, sharp peaked movements of the eyeball seen on electrooculogram.EEG shows low voltage, high frequency waves similar to an active, awake EEG pattern R is known as paradoxical sleep because of thisawake EEG pattern. REM sleep accounts for 18-23 % of total sleep. It is divided into phasic and tonic phases. During REM, tone reduces in all the voluntary muscles except extra-ocular muscles and diaphragm

due to inhibition of alpha motor neurons. Many sleep disorders are related to abnormalities in REM sleep.

Electrophysiological changes in sleep are summarized in Table 1.

FIGURE 1: Typical hypnogram of a young adult showing the sleep architecture. (Ref: Koo DL, Kim J. The Physiology of Normal Sleep.Hanyang Med Rev. 2013;33(4):190. (56))

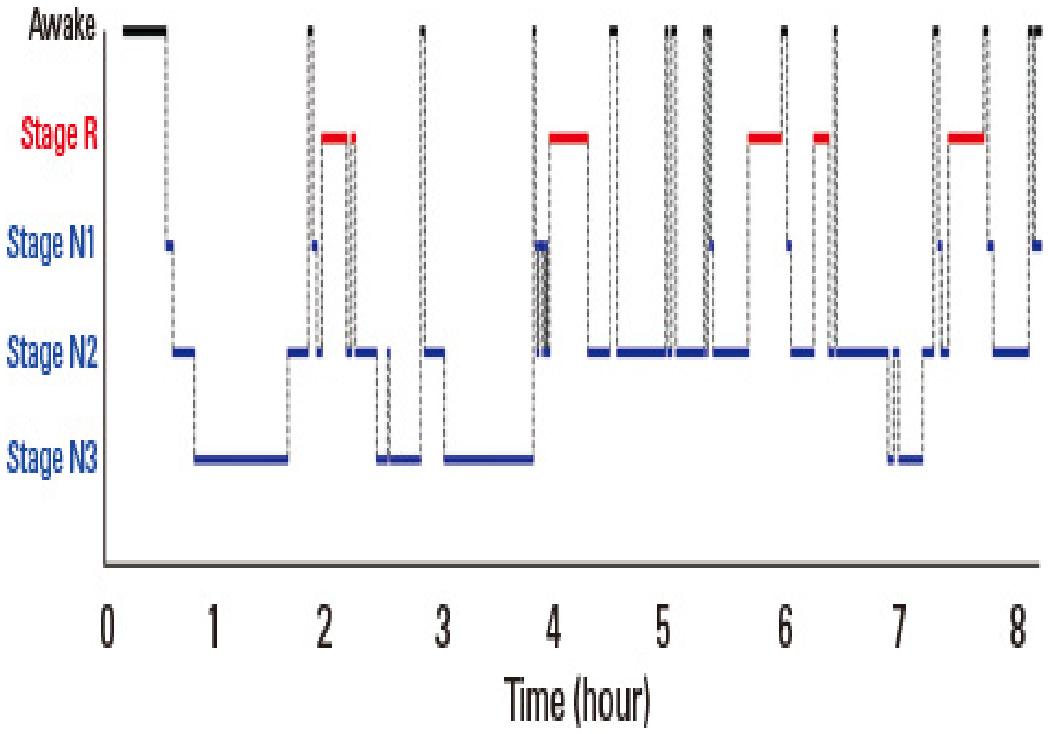


TABLE 1:Electrophysiological properties of sleep stages

Stages of Sleep	EEG	EMG	EOG
N1	Low amplitude, mixed frequency; theta rhythm (4-7 Hz), with vertex sharp waves (biphasic waves, ≤ 0.5 sec.)	Slight decrease in tonic muscle activity	Slow eye movements
N2	Low-voltage activity with sleep spindles (11-16 Hz) and K-complexes (biphasic waves ≥ 0.5 sec.)	Further decrease in muscle activity	No eye movements
N3	High-amplitude (≥ 75 μV), slow (≤ 2 Hz) waves lasting ≥ 20% of the epoch	Low tonic activity	No eye movements
REM	Low-voltage, saw-tooth waves (2-6 Hz), predominant theta activity	Muscle atonia (phasic twitches may be present)	Rapid-eye movements

(EEG- Electroencephalography, EMG- Electromyography, EOG-Electrooculogram,NREM- Non rapid eye movement, REM- Rapid eye movement)

(Ref:Sleep disorders in children and adolescents: A practical guide. In Rey J (ed), IACAPAP e-Textbook of Child and Adolescent Mental Health. [Internet] Available from: http://iacapap.org/wp-content/uploads/I-4-SLEEP-2014.pdf(57))

FIGURE 2: EEG waveforms in different sleep stages(Ref: Stages of Human Sleep - Sleep eBook Available from: http://sleepdisorders.sleepfoundation.org/chapter-1-normal-sleep/stages-of-human-sleep/:(58))

Physiological changes during sleep:

Various physiological changes observed during sleep have been described in Table 2

TABLE 2: Physiological changes during sleep:

System	Changes during sleep
Respiratory system	NREM • decrease in respiratory drive, decrease in muscle tone of the upper airway leading to reduction in minute volume and alveolar ventilation and a doubling of airway resistance. • Hypercarbic and hypoxic ventilator drives are reduced compared with wakefulness. REM • Further decrease in hypercarbic and, hypoxic ventilatory drives. • Irregular breathing pattern. • Atonia in chest wall muscles seen as paradoxical movement in infants. • Maldistribution of ventilation and impaired ventilation–perfusion matching leading to arterial hypoxaemia
Cardiovascular	• Reduction in Blood pressure (BP), Cardiac output (CO) and Systemic vascular resistance (SVR) and the heart rate during NREM and tonic REM sleep • Increase in BP, CO and SVR above waking values during phasic REM sleep.
Central Nervous system	NREM • Decrease in Cerebral Metabolic rate (CMR), Oxygen consumption and neuronal discharge. • Reduction in sympathetic tone and increase in parasympathetic tone.

	REM • Cerebral blood flow (CBF) increases by 50–100% above the • level of resting wakefulness • Increase in CMR, oxygen consumption and neuronal discharge • Increase in sympathetic tone in phasic REM sleep
Renal system	Reduction in glomerular filtration rate and increase ADH secretion is forming low volume concentrated urine.
Endocrine system	• Melatonin is released from the pineal gland under the control of the supra-chiasmatic nuclei (SCN) in a 4–5 hours pulse, usually beginning at the onset of darkness (~9 pm), has a permissive role for sleep. • Growth hormone is secreted during the initial part of slow wave sleep, especially during puberty. • Prolactin secretion increases shortly after sleep onset and decrease with wakefulness. • Cortisol reaches a trough in the early hours of the morning and a peak just after waking.
Temperature control	• Thermoregulation is maintained during sleep. • Body temperature is linked to the circadian rhythm and reaches its nadir at about 3 am.

(Ref: Schupp M, Hanning CD. Physiology of sleep. BJA CEPD Rev. 2003 Jun 1;3(3):69–74.(22))

Regulation of sleep:

The sleep–wake cycle follows a 24 hour circadian pattern. There is an intrinsic biological clock located in the suprachiasmatic nucleus (SCN) on either side of third ventricle above the optic chiasma. This intrinsic clock is adjusted to a 24 hour duration by external cues called ‘zeitgebers’. Zeitgebers include light, darkness, clock time, work pattern and meal time. SCN controls melatonin secretion by the pineal gland just before sleep onset. In jet lag for example, sleep time does not match the secretion of melatonin, causing sleep disturbances.

Propensity to fall asleep is determined by a balance between two coupled processes.**Process C** is the process of endogenous circadian rhythm that organizes sleep wake cycle into predictable and fixed periods of sleepiness and alertness over a 24 hour period. **Process S**is the homeostatic process that regulates the depth and length of sleep which is a function of time awake since last sleep and duration and quality of previous sleep. When a person is deprived of sleep, sleep pressure builds up due to accumulation of biological products called ‘somnogens’ like adenosine and other cytokines. This results in sleep, thus restoring homeostasis. Process C defines the period of maximum sleepiness to be around 2 am and again at 2 pm and that of maximum alertness around early morning 6 am and again around 6 pm.(21,55)

Multiple areas in the nervous system are involved in sleep regulation, there is no definite anatomical ‘sleep centre’ identified. Reticular activating system in the brain stem is active during wakefulness. Neurotransmitters involved in its activity include acetylcholine, nor-adrenaline, dopamine and histamine. Slow wave sleep is associated with GABA from neurons in the forebrain. REM sleep is initiated by the pontine neurons where acetylcholine is the main neurotransmitter. Orexins from hypothalamus also play a role in the control of REM sleep(55).

Developmental aspects of sleep:

A mature sleep architecture as described above is preceded by several developmental changes. These changes follow the maturation of central nervous system as well as other physiological and environmental changes that occur during childhood and adolescence.(26)

A term newborn starts sleeping from REM stage and sleeps about 16 – 18 hours a day. Fifty percent of the total sleep duration in a term neonate is REM. REM sleep plays a significant role in the maturation of CNS; hence during neonatal period and infancy when maximal brain development occurs, REM constitutes a major component of sleep.(21)As a child grows older, sleep starts with NREM, which forms 75% of total sleep. There is a concurrent reduction in total REM in older children. Daytime sleep duration reduces with a major reduction occurring by 5 years of age. During sleep each

NREM-REM cycle duration increases from infancy to childhood, so that the number of nocturnal awakenings at end of cycles is also reduced(26).

Adolescent sleep transition and patterns:

A number of changes occur in sleep patterns during adolescence that continue into adulthood.

In 1990,Carskadon and colleagues made some important observations regarding adolescent sleep.(59)

- Total night time sleep duration decreases over the period of adolescence.
- Bed times become gradually later as adolescents grow up and so do waking times
- Total sleep durations vary over the days of the week. There is a large difference between sleep durations during weekdays and weekends. The difference increasesfurther from middle to late adolescence, when the difference can be as much as 2 hours for 18 year olds.

They also studied various factors that affect adolescent sleep patterns.

- Pubertal development: Even if total sleep duration remains the same, older adolescents at a Tanner stage of 3, 4 or5 had more daytime sleepiness when compared with younger adolescents at Tanner stages 1 and 2. This suggests that puberty per se increases daytime sleepiness among adolescents.
- Parental involvement: Parents were more involved organising bed time for younger adolescents and had a greater influence on the wake up time for older adolescents.
- School schedules: Morning school timings were observed to have a large impact on adolescent sleep patterns during weekdays. Early start of school during weekdays results in inadequate sleep. American Academy of Paediatrics recommends school timings not earlier than 8:30 am, in order to facilitate the recommended 8-9 hours of sleep for adolescents.(28)
- Circadian Rhythms**:**With increasing age, bedtime is also delayed. It is between 09:00 to 09:30 pm in 10 year old adolescents as compared to midnight in 17 year old adolescents.(59)In additionthis might reflect the freedom given to adolescents to select their bed time. Morningness/ eveningness scales suggest that more adolescents prefer later bedtimes for better functioning. This may indicate a change in the circadian rhythm in adolescents resulting in later bedtimes and wake times(59).

Physiological functions of Sleep

There are multiple theories proposed to explain the physiological function of sleep.

1. Theory of inactivity, proposes that living creatures conserve energy as the metabolism is low during sleep. This helps the animal to survive socially when there is lack of availability of food. This theory is supported by observation that body temperature and caloric need reduces during sleep.(55)

2. Restorative theory, notes that repair and regeneration of body cells occur during sleep. There is removal of toxic metabolites accumulated in brain during the day and enhancement of neural functions.(55)

3. Role in memory and cognitive function: During sleep there is an increase in the formation of synapses and plasticity of the brain which indicates that sleep has a role to playin learning and memory. Newborns have nearly 50% of total sleep as REM sleep which is important for brain development. NREM sleep restores the learning circuits overnight.(55)

Current recommendations for optimal sleep duration:

The optimal duration of sleep can be determined by the hours of sleep after which the individual feels alert and refreshed and continues to be active throughout the day without effort, even when doing boring activities. This duration varies among individuals and age groups.(36) The National Sleep foundation guidelines 2015, for recommended sleep durations for various age groups, were further revised by a panel of experts from various related fields including those from American Academy of Pediatrics. Theguidelines were presented in three categories for each age group viz. (i) recommended (ii) may be appropriate for some individuals (iii) not recommended to account for the individual variations.(60)

TABLE 3: Recommended sleep amounts for children and adolescents

Age group	Recommended range (hours)	May be appropriate(hours)	
		Minimum	Maximum
Newborn (0-3 months)	14 -17	11-13	18-19
Infant (4-11 months)	12-15	10-11	16-18
Toddler (1-2 years)	11-14	9-10	15-16
Preschool (3-5 years)	10-13	8-9	14
School age (6-13 years)	9-11	7-8	12
Teenager (14-17 years)	8-10	7	11
Young Adult (18-25 year	7-9	6	10-11

(Ref: How Much Sleep Do We Really Need? https://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need - National sleep foundation website (60))

Sleep Insufficiency:

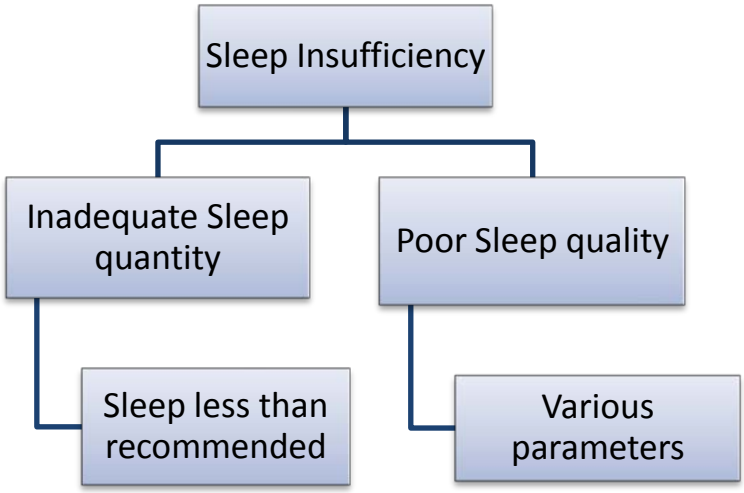
Sleep insufficiency exists when sleep is insufficient to support adequate alertness, performance, and health, either because of poor quantity denoted by reduced total sleep time orby poor quality noted by fragmentation of sleep by brief arousals.(36)

Sleep deprivation can be acute or chronic.Lack of sleep over one or two days is termed as acute sleep deprivation. Chronic sleep insufficiency, also called sleep restriction or **sleep debt**is regularly sleeping less than that required for optimal functioning.(21,36)

Sleep insufficiency results from voluntary sleep restriction or insufficient opportunity to sleep. It is described in scientific literature using various terms like inadequate sleep, short sleep duration, sleep loss and sleep restriction. These can be termed as ‘sleep problems’ which are different from specific clinical sleep disorders. The primary difference between sleep insufficiency and insomnia lies in the fact that, sleep deprived individuals if given an opportunity will fall asleep and compensate for the sleep loss, where as individuals suffering form insomnia cannot fall asleep even if they are sleep deprived.

Sleep insufficiency has both quantitative and qualitative aspects. For a complete assessment of sleep insufficiency, both qualitative and quantitative factors should be taken in to account (Figure 3).(61)

FIGURE 3: Aspects of sleep insufficiency



Inadequate sleep:If the totalsleep duration is less than that required for optimal alertness, it results in sleep insufficiency. This kind of sleep deprivation can be acute if a person stays awake the whole night. Chronic deprivation occurs even with partial loss of sleep over several nights. However the effects of quantitative sleep restriction may not be evident clinically unless total duration of sleep is less than 6 hours.(36) This can be assessed using various parameters like bed time, sleep onset time, total sleep time, wake up time, difference between total sleep time over weekday and weekend.

Sleep quality: Even if one sleeps for an adequate duration of sleep, one may still suffer from the effects of sleep deprivation if the sleepquality is not good. Sleep quality can be assessed using sleep related behavioral parameters and tools. These include sleep onset latency, frequency of nocturnal awakenings, wake after sleep

onset time, sleep efficiencywhich is total sleep time/total time in bed or how they feel after waking up. (62,63) Adolescent Sleep Wake scale (ASWS), one of the tools used in this studydefines sleep quality based on 5 behavioral dimensions viz.going to bed, falling asleep, maintaining sleep , reinitiating sleep, and returning to wakefulness.(52)

Consequences of sleep deprivation in adolescents:

Effects of acute sleep deprivation:

Acute sleep deprivation can affect neural growth and development of the brain. When the adolescent mice were experimentally deprived of sleep, it affected the balance between growth and depletion of brain synapses. This emphasized the impact of acute sleep restriction on the developing adolescent brain.(19)

Cognitive impairments: Sleep deprivation evenin a single night among adolescentsaffects adversely the cognitive processing, reaction time and attentiveness. Sleep deprived adolescents have demonstrated a lag in efficient thinking and learning.(3,36)Acute sleep deprivation causes impairment in logical reasoning, complex subtraction tasks, flexible thinking and focusing on multiple goals simultaneously. Using functional MRI, reduced function in thefrontopareital attention network and insula and the medial frontal cortex have been demonstrated in sleep deprived individuals.(36) Conversely, gradual extension of sleep has been

resulted inimprovement in the cognitive performance especially visuospatial processing in adolescents.(64)

Sleepiness and microsleeps: When a person is sleep deprived and physically inactive,the homeostatic process S takes over voluntary control which causes periods of sleep interspersed between wakefulness for few seconds. There may be no awareness of such brief periods of sleep. These periods are called micro-sleeps. Such periods can be fatal while driving a motor vehicle.(36)Daytime sleepiness can be measured as daytime or classroom naps, oversleeping, morning sleepiness or desire to sleep more.(32)

Mood disorders and suicidal ideation: Studies have revealed an increase in suicidal ideation as well as suicide attempts among adolescents who were chronically sleep deprived.(39) A cross sectional study of 8530 students in Korea from 7- 11 grades reported that oversleeping during the weekend lead to increased suicidality removing the confounding factors ofdepression, daytime sleepiness and snoring.(12) Several studies have shown relationship between depression and sleep insufficiency

Sleep deprivation can cause detrimental effects on mood and affect of the individuals.Sleep deprived adolescents experiencedless of positive emotions like happiness, energy, cheerfulness, activeness and pride. They also reported higher levels of anxiety. This is attributed to decreased activity in the prefrontal cortex

(PFC) in sleep deprived states. PFC has an inhibitory control on theamygdala the centre for emotions like anxiety.(33) Adolescent girls whose sleep was restricted demonstrated an increasedvulnerability to the effects of sleep restriction on mood.(34) A reduction of 2.5 hours of sleep over a few nights made adolescent subjects more angry, confused, fatigued, irritable and with poor emotional regulation.(18) An experimental study in mice demonstrated that chronic sleep restriction lead to reduction in hippocampal volume which may explain the relation between sleep insufficiency and mood disorders.(6)

Effects of Chronic sleep insufficiency:

Academic performance and memory: Insufficient sleep, poor sleep quality and sleepiness are common problems in children and adolescents being related to learning, memory and school performance. (65)Three different meta-analyses showed that sleep quality, sleep duration and sleepiness were associated with school performance of adolescents although the strength of association was not very strong. (r= -0.133 for sleepiness, 0.096 for sleep quality, and 0.069 for sleep duration) (66)Eighty percent of adolescents in a survey done in the US, who slept optimal hours received better grades compared to those who obtained insufficient sleep.(67)Shorter sleep duration during weeknights and weekends increased the risk of problems at school.(17)Some studies showed that children with excessive

sleepiness had poor performance in English and mathematics with increase in reaction times duringverbal and arithmetic working memory tasks.(68)(8)

Obesity, cardiovascular morbidity and metabolic problems:

Twenty cross-sectional studies and 7 prospective studies in children and adolescents on causality demonstrated a positive association between obesity and sleep deprivation. Obesity has been associated with less than 6 hours of sleep.(16)Studies suggest that adolescents who sleep less have higher BMI. There is a dose dependent inverse relationship between duration of sleep and weight. (13)

Several mechanisms have been proposed to explain the association between sleep restriction and obesity. Restricted sleep causes alterationsin insulin, ghrelin, leptin and cortisol resulting in insulin resistance, increased hunger and decreased satiety. (39)Studies have demonstrated a reduction in glucose tolerance by more than 40% when subjects were deprived of sleep. They showed an increase in insulin resistance as well as non- insulin dependent utilization of glucose (14,16)

Adolescents who were chronically sleep deprived preferred foods with a high glycemic index; this has been explained by alterations in satiety levels and the hormones leptin and ghrelin.(7)(14)

Immune mechanisms also have been proposed to explained causality between sleep deprivation and obesity. Sleep modulates the immune system. Conversely

actions of the immune system and inflammatory cytokines affect sleep. Insufficient sleep, activates various inflammatory cascades as shown in Figure 4 ,that ultimately contribute to the causation of obesity and obstructive sleep apnea (Figure 4)(11)

Several studies among populations have demonstrated association of sleep deprivation with hypertension, coronary heart disease and stroke**.**(36)A cross sectional study among healthy demonstrated thatpoor sleep quality was associated with pre-hypertension which was independent of obesity, sleep apnea and other co-morbidities.**A**dolescents with a sleep efficiency of≤85%, had at 3.5-fold increased chances of being pre-hypertensive or hypertensive.(69)A study done among Indian adolescents living in Gujarat did not show an association between short sleep duration and blood pressures amongst adolescents however, sleep duration < 7 hours was associated with higher adiposity and cardiovascular reactivity (measured by increase in heart rate and blood pressure after exercise)in the same group.(1)

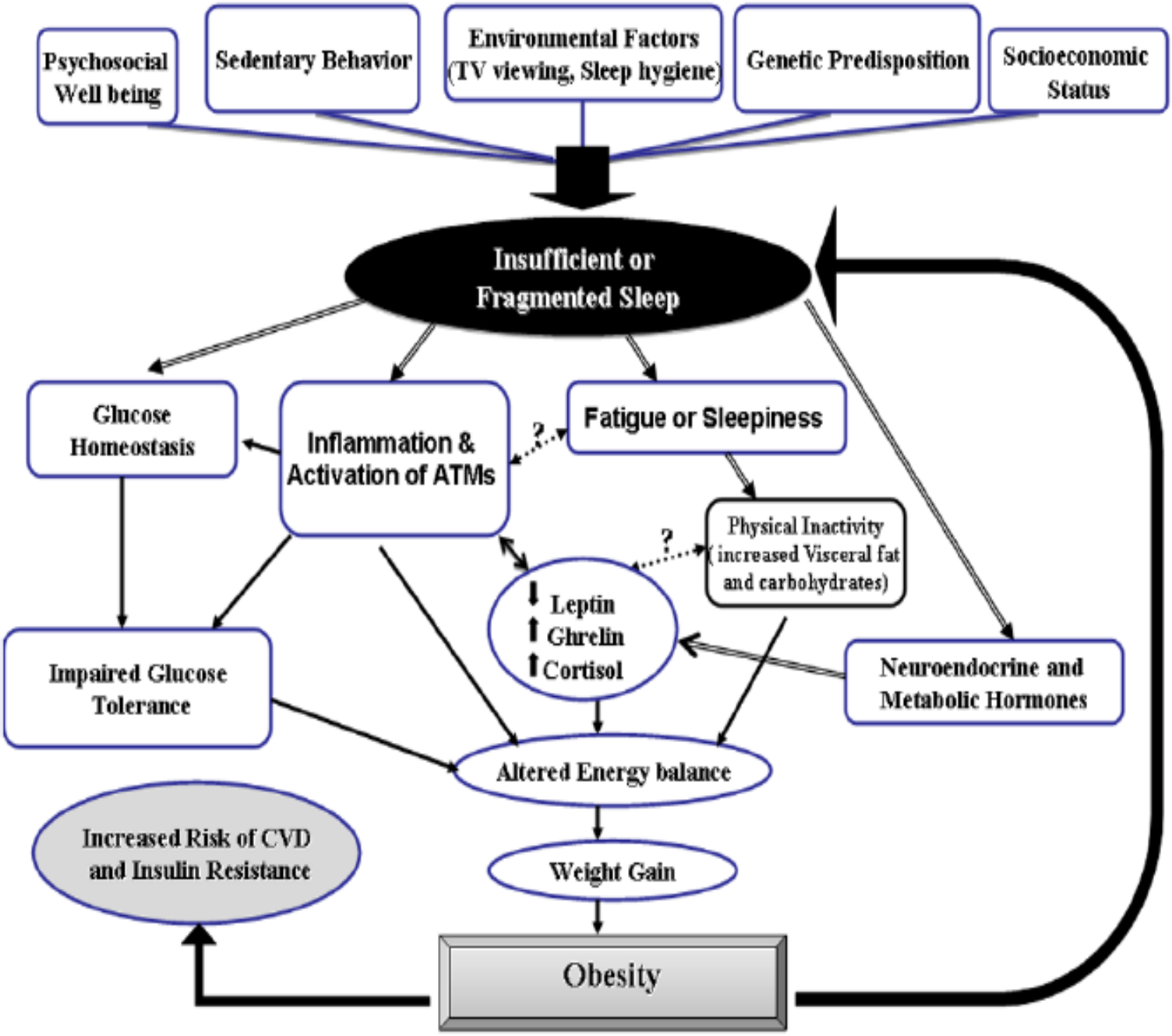


FIGURE 4: Interaction of insufficient or fragmented sleep and obesity in activating inflammatory pathways leading to increased risk of CVD (Ref: Kim et al. Inflammatory pathways in children with insufficient or disordered sleep (11)).

Drowsy driving and motor accidents:

Adolescents often report sleepiness while driving. One fifth of high school students who had a driving license reported poor-quality of sleep, 40% reported sleepiness while driving(39)Pizza et al compared adolescents who hadnever had road traffic accidents, with those who had ≥ 1 road traffic accidents.Those who had had ≥ 1 reported having driven more at night while sleepy, had poor quality sleep and havingalso used caffeine, tobacco and other stimulants more commonly.(70)

Causes of sleep insufficiency in adolescents:

Sleep deprivation in adolescents can be becauseof intrinsic biological factors or extrinsic factors related to their physical and psychosocial environment in which they lived.

Extrinsic factors:

- **Academic demands and involvement in extracurricular activities:** Adolescents increasingly face pressure to perform well in academics as well as extracurricular activities with ever increasing competition among peers.Increased academic pressure leads to reduced sleep quality as well as sleep duration. (71) More homework affects sleep duration and sleep hygiene(72). Extracurricular activities result in teenagers going late to bed; however since the school start time is fixed it causes sleep restriction.(67)Dewald et al further reiterated in their study showing that adolescents had more fragmented sleep during exam times.(73)

International,Labour Organization (ILO) reported, an average 25% of children being engaged in some form of labour in developing countries. Of the children and adolescents engaged inlabour, 61 % live in Asia, Africa 32% and Latin America 7%. Daily labour results in insufficient sleep due to the dual burden of work and school.(42)

- **School start times:** School start time is one of the modifiable factors affecting adolescent sleep. Carskadon et al demonstrated that a delay in school start time by 65 minutes reduced sleepiness levels in 10th grade students(28). Later school times for middle and high school students had several benefits including later bed times, longer sleep duration, better performance in academics, better attention in class room and other activities, lesser absenteeism and a decreased risk of motor vehicle accidents involving youngsters. Wahlstrom et al demonstrated that even if school timings were made later than before, children did not postpone their usual bed time and thus obtained longer sleep than before.(13,28,67)(74) American Academy of Pediatrics in 2014 recommended later school times, not before 8:30 am for middle and high school students.(28)(75)
- **Influence of electronic media and social interaction:** Use of electronic media such as television, video games, computers and cell phones have a detrimental effect on sleep in several ways. Having a television in bedroom has been associated with later bedtimes, reduced sleep duration, increased daytime

sleepiness and longer sleep onset latency.(39,76)Availability of electronic media during bedtimes keeps the teenager awake longer, thus reducing the total sleep time. Exposure to light from electronic media suppresses melatonin secretion and disrupts the circadian rhythm. There is increased level of emotional and mental arousal due to use of electronic media which also affects the quality of sleep in adolescents.(39)Teenagers who have smart phones tend to spend more time online, calling and sending messages as compared to those who had conventional mobile phones.(76) A cross sectional study of 11- 13 year olds in England revealed that early awakening was associated with the use of all forms technology before bedtime. The maximum effect was with watching television. Television viewers also reported to have higher incidence of sleep walking. Music listeners were more prone to having night mares.(77)

- **Environmental factors:** A sleep conducive environment for adolescents would include following a consistent sleep schedule, sleeping in a cool dark environment. Contrary to that many adolescents catch up sleep on weekends due to sleep deprivation during weekdays.
- **Caffeine drinking:** There is an increase in use of caffeine amongst adolescents. Moderate to high level of caffeine consumption adversely affected sleep duration, sleep onset latency and increased sleepinessamong adolescents (39,67) It also affected the quality of sleep by disrupting sleep architecture and decreasing the amount of slow wave sleep.(39)Use of

caffeine leads to vicious cycle as increased caffeine consumption leads to increase sleepiness which in turn causes the adolescent to consume more caffeine(78).

- **Other factors:** There is some evidence that increased consumption of alcohol, over the counter drugs as well as prescription drugs may cause increase sleepiness in teenagers.(39)

Intrinsic factors:

- **Developmental changes in adolescent sleep:** During puberty, there is a delay in melatonin secretion of secretion leading to a shift in the circadian rhythm;and also there is a slower build up of sleep pressure (propensity to fall asleep) in adolescents leading to late onset of sleep.(27,67) There is a drastic reduction in the amount of slow wave sleep in adolescents further causing reduction in restorative sleep in adolescents.(36,67)
- **Sleep disorders:** Some sleep disorders are seen commonly in adolescents. Delayed sleep phase syndrome (DSPS) is characterized by persistent delay in sleep onset of more than 2 hours than the desired bedtime leading to disruptions in daily activities of the adolescent. Adolescents are at a greater risk to develop this disorder as they tend to stay awake till late.(67)

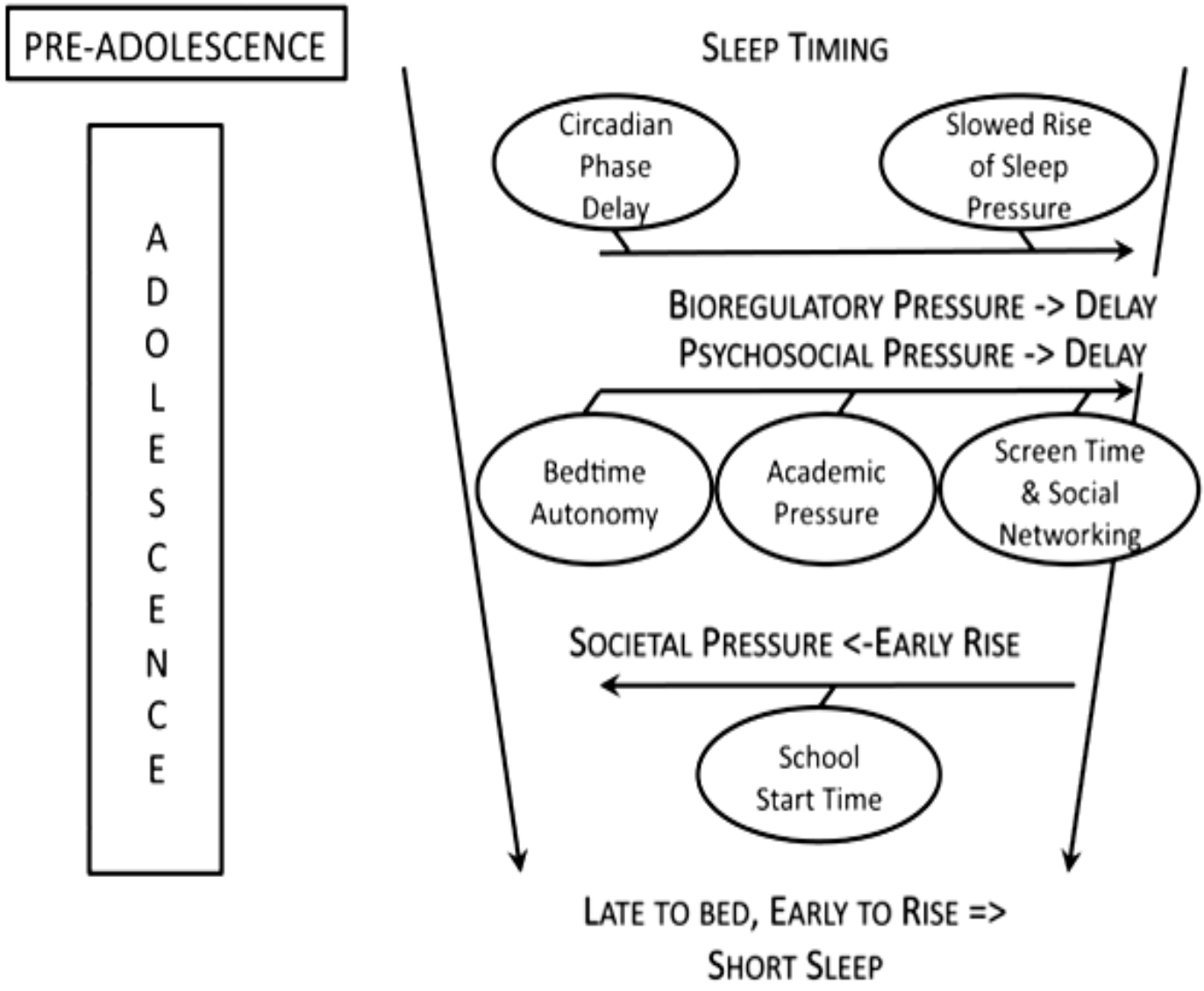


FIGURE 5: Interaction of extrinsic and intrinsic factors causes insufficient sleep in adolescent (Ref: Mary Carskadon. Sleep in Adolescent: The perfect storm)(27)

Sleep hygiene:

Sleep hygiene is defined as a set of behavioral and environmental recommendations intended to promote healthy sleep(78). Current evidence shows that sleep hygiene

practices are not sufficient when used as a sole measure for clinical sleep disorders however they may be a useful tool for the general population who do not have a specific sleep disorder(78).

Although, quality of sleep in adolescents may not be fully determined by sleep hygiene practices, they do have an impact on sleep quality(79). Several studies have shown relationship between sleep hygiene and several sleep quality parameters as well as duration and improving these practices improves performance and reduces sleepiness levels in subjects (4,13,15,46,47,52,76–81).

There are several advantages of recommending sleep hygiene practices to population in general(78). Sleep hygiene education can be given even by health workers, not needing doctors every time, hence a large population can be catered. It is relatively inexpensive method to improve sleep quality which can be delivered easily by various media. The acceptance of sleep hygiene practices is better among subjects than structured clinical programs for sleep improvement(78).

However, poor sleep hygiene in some individuals may be a manifestation of clinical sleep disorder(78). It is important to refer such individuals for clinical treatment by an expert in sleep disorder.

Current practice is to recommend sleep hygiene as a set of activities with an intention to improve sleep quality. However, evidence suggests sleep hygiene is a combination of

several factors. Some of these factors may have more effect on sleep quality and duration than others(30,43,78,79,82). Hence it is important to look at them individually and their impact on sleep quality.

LeBourgeois et al have defined Sleep hygiene as a composite of 9 different aspects called as domains which are assessed by a few questions in the tool designed by them called Adolescent Sleep Hygiene Scale (ASHS)(52)viz physiological, cognitive, emotional, sleep environment, day time sleep, substance use close to bed time, bed time routine, sleep stability, bed/bed room sharing.

Assessment of sleep in children and adolescents(21,57,83,84)**:**

Assessment of sleep quality, quantity and sleep disorders can be done by objective as well as subjective methods.These methods have their advantages and disadvantages. These can be selected these methods as single or in combination depending on what one aims of the research.

Objectives measures:

Objective measures include polysomnography, actigraphy, multiple sleep latency test (MSLT) and infrared camera. Polysomnography is the gold standard for objective sleep measurement. It records the physiological changes in the body during sleep including EEG, heart rate, eye movements and muscle activation. It can identify sleep stages, respiration and limb movements during sleep. The disadvantage of polysomnography is

that it measures sleep in a controlled laboratory setting.Actigraphy measures physical activity and rest by a sensor. It gives an account of sleep wake periods, total sleep duration, number of arousals and sleep onset latency. Multiple sleep latency test (MSLT) is an objective measurement of daytime sleepiness. The objective methods of assessment do not take into consideration severalbehavioral factors that affect sleep.

Subjective measures:

Subjective sleep measures include sleep diary and parent and child report sleep questionnaires. These questionnaires inquire about the sleep related habits and activities, sleep patterns retrospectively over a specified time period. Subjective sleep questionnaires can be use along with objective tools to give a comprehensive assessment of sleep quality and quantity. There are several questionnaires designed by various authors to assess pediatric sleep s taking into account the developmental changes in sleep behavior in a pediatric population. Sleep questionnaires measure sleep habits or patterns, sleep hygiene, attitudes and cognition associated with sleep, subjective daytime sleepiness. These questionnaires can be validated against the objective tools. Subjective measures are cost effective and easy to use. Their reliability is limited by response bias and compliance of subjects. Parents may not be aware of children's sleep behavior which limits the use of parent report questionnaires.

RATIONALE FOR THE STUDY:

A few studies carried out in India reveal that significant number of adolescents do not sleep adequately.(37)To best of our knowledge, there is a paucity of data regarding sleep related behavior, factors affecting sleep and sleep quality among Indian adolescents.The consequences of insufficient sleep in Indian adolescents have not been studied widely yet.(29)To our knowledge, no attempt has been made to study the qualitative aspect of sleep in Indian adolescents. This study is an attempt to obtain cross-sectional information on adolescent sleep using school going adolescents as subjects. The study aims to provide the baseline characteristics of Indian adolescents' sleep quality,sleep hygiene and sleep problems. Information obtained from this study can be used in future studies to evaluate the association of sleep quality and medical problems like obesity, mental disorders, cardiovascular health etc. An attempt has been made to collect data using tools which have been standardised and validated among adolescents elsewhere. This data can then be compared to data from other parts of the world. This study will attempt to identify if sleep is a problem in our adolescents, if yes then what are the likely factors causing these problems, if these are similar to those found in other countries, whether we have some specificissues peculiar to our country. It will also help us to consider if guidelines recommended in the west regarding sleep hygiene can be applied to our adolescents. This study aims to understand what good sleep means to adolescents in India.

METHODOLOGY

Design:

It is a cross sectional questionnaire based observational study

Setting:

A community based survey was done in the schools of urban and semi urban regions of Vellore city.Permission from the District Chief Education Officer was obtained before the study was started. We received permission for fivegovernment schools in Vellore city. The survey was conducted in 3 schools. One of the schools authorities refused to participate in the survey.The sample included of both government and private schools.

Population:

Inclusion criteria:

1) Adolescents studying in grade 9 and 11 were selected for the study.

Exclusion criteria:

1) Children who did not obtain informed consent from their parents.

2) Children who were in grades10 and 12.

Primary outcomes of the study:

- Sleep hygiene score
- Sleep quality score
- Sleepiness score
- Correlation between sleep hygiene and sleep quality and sleepiness

Methodology:

The principal investigator visited each of the schools who were willing to participate in this survey at least 3 times. During the first visit, school authorities including the headmaster and few teachers were explained toabout the need for such a study, the procedure, the time required and benefit to the general adolescent population from the study. Subsequently, according to theconvenience of the schools,two more visits were made to each school.All the $9^{th}$and 11^{th} gradestudents were selected for the study.All the schools had both English and Tamil as their medium of instruction. During the second visit, the principal investigator explained details about the study to the students and their class teacher, in the vernacular language. After that, each of the students was provided with the information sheet and a parental consentform in both Tamil and English. The written parental consent form included few questions about the family such as education and income. Parents were requested to provide these details themselves if they agreed to allow their wards to take part in the study. During the third visit, those students whose parents had given consent were given the main questionnaire.The method of filling the questionnaire was explained and they were

allowed 30-45 minutes to complete it. Their doubts were clarified before and during the session. The principal investigator was present through-out the session. Students were reminded during the period not to discuss the questions or the answers amongst themselves, as much as possible. At the end of the session, the parental consent as well as the completed questionnaire were collected and stapled together. They forms had contact for the principal investigator and co-investigators, so that they could follow up with the investigators about the results of the survey if they wanted.

Data measurement:

Sleep parameters that were measured include:

- **Bed time Weekday**
- **Wake up time Weekday**
- **Bed time Weekend**
- **Wake up time Weekday**
- **Night Total sleep time (nTST) weekday**
- **Night Total sleep time weekend**
- **Sleep debt – Difference of nTST (weekend) and nTST (weekday)**

<u>Tools for measurement of data:</u>

Sleep hygiene in adolescents:

Sleep hygiene amongst teenagers was primarily assessed using Adolescent Sleep Hygiene Scale (ASHS).(52)The ASHS is a 28-item self-report pencil-and-paper measure that assesses sleep hygienepractices in 12- to 18-year-old adolescents

designed by M. K. LeBourgeois et al. The total ASHS score is a mean of 9 different conceptual domains (mean of multiple items) determining overall sleep hygiene in adolescents. These domains arephysiological (5 items), cognitive (6 items), emotional (3 items), sleep environment (4items), daytime sleep (1 item), substances use close to bedtime. (2 items), bedtime routine (1 item), sleep stability(4 items), and bed/bedroom sharing (2 items). Students report how often a particular sleep-relatedbehavior has occurred during the past one months using 6-point scale -“always,”“frequently-if not always,” “quite often,” “sometimes,” “once in a while,” and “never”. Each of these responses is scored from 1- 6. Mean domain scores can be calculated and the total sleep – hygiene score is the mean of scores of 9 domains. Higher scores indicate better sleep hygiene practices.An evidence based review of subjective pediatric sleep measures shows ASHS to be approaching well established in measuring sleep hygiene behavior according to American Psychological Association(APA) Division 54 Evidence-Based Assessment (EBA)Task Force criteria.(83) The ASHS is the only self reported measure currently available for use with the age group older than 12 years to measure sleep hygiene. (83) The psychometric reliability in terms of Cronbach's α ranged from .46 to .74 for the sleep-hygiene domains and was .80 for the full scale (ASHS total) tested for Italian and American population(52).

The questions included in each of the ASHS domains have been included in the Annexure.

ASHS domains:

- **Physiological**: This domain includes use of caffeine containing drinks close to bedtime, sleeping with a stomach ache or hunger, being involved activities like running, playing outside and having more amount of water before going to bed that may give rise toilet needs during night.
- **Cognitive**: This domain assesses the use of various electronic media like television, mobile phones, etc. before sleep or while being on the bed that keeps one mentally active just before sleep.
- **Emotional:** This domain assesses whether subjects experience strong emotions close to bed time.
- **Sleep environment:** This domain indicates the availability of a physical environment that is conducive for good quality sleep. This includes a noise free, dark and temperature conditioned bedroom
- **Daytime sleep:** This domain indicated whether the subjects sleep more than 1 hour during the day that may affect the nocturnal sleep.
- **Substances:** This domain assesses the use of tobacco and alcohol during the evening time.
- **Bedtime routine:** This domain indicates following a fixed routine every day before bedtime which may include taking bath, brushing teeth, reading story books etc. before going to bed. This is aimed to facilitate sleep.

- **Sleep stability:** This domain indicates the consistency with which a fixed sleep schedule is followed by the subjects over the weekdays and weekends.
- **Bed/bed room sharing:** Sharing of bed or bed room may affect the sleep quality which is assessed by this domain.

Measurement of sleep quality:

The quality of sleep of adolescents was measured using Adolescent Sleep-Wake Scale (ASWS) designed by M. K. LeBourgeois et al. who had also designed the ASHS tool. Similar to ASHS, ASWS is also a self reported questionnaire used to assess sleep quality in the age group 12-18 years of age. It consists of5 behavioral dimensions called ASWS subscales that include going to bed (5 items), falling asleep (6 items), maintaining sleep (6 items), reinitiating sleep (6 items), and returning to wakefulness (5 items). The mean of each subscale is calculated and the total ASWS score is the mean of the above mentioned 5 behavioral subscales that represents the overall sleep quality of the respondents. Students mark how often a particular sleep behavior has occurred in the last one month on a 6 point scale -“always,” “frequently-if not always,” “quite often,” “sometimes,” “once in a while,” and “never”. Higher scores indicate better sleep quality. The psychometric reliability was good Cronbach's α being0.86. It has a concurrent validity with ASHS tool. However, when an additional validation it

was carried out, it was rated as “approaching well established” by EBA (Evidence-Based Assessment Task Force) rating.(83)

Some additional description of sleep quality was done using criteria provided with ASWS including number of nocturnal awakenings, time taken to reinitiate sleep after nocturnal awakening, and time taken to become fully awake after waking up in the morning.

This tool has been used in many parts of the world translated to vernacular languages and validated for those population and has been published in a few peer reviewed articles.(43,52,85)

Sleepiness levels in adolescents:

Epworth Sleepiness Scale (ESS) revised for children is used as a tool to measure sleepiness in adolescents.(86) The ESS is also a self administered questionnaire that measures the participant’s propensity to fall asleep while doing a particular activity. It indicates theirgeneral level of day time sleepiness. It rates sleepiness on a 4 point scale (0-3) where 0 indicates ‘never doze off’ and 3 indicates‘high chances of dozing off’. ESS consists of 8 items. It was designed by Murray Johns in 1991. Validity of ESS has been tested against Multiple Sleep Latency Test (MSLT) as a gold standard. Author describes that ESS scores increase with sleep deprivation but it is not useful measure of sleep debt. Normal ranges for ESS score has been defined based on various populations.(87)Generally a score

range of 0-10 is considered normal. Any score more > 10 indicates sleepiness. ESS is fairly reliable with internal consistency of 0.75. (83)The revised ESS for children has not been validated for use in children and adolescents. Some studies have reported that ESS is not useful for adolescents, (51) Preliminary use of modified ESS has shown good correlation with sleep disorders and other gold standard measures of sleepiness. However, more data on validation of this tool is needed.(83) ESS can be used for children and adolescents 2-18 years of age and isa relatively simple tool, hence we decided to use ESS as a tool for sleepiness assessment.(83)

Adaptation and validation of the tools for use in local population:

The above mentioned tools were translated into Tamil and then back translated by people proficient in both English and Tamil. Reliability and validity of the translated version is yet to be done. The authors plan to do the validation as a separate research project.

Ethical considerations:

The proposal forthe study was presented before the Institutional Review Board and the Ethics committee before the study was started. After the required modifications suggested by the committee, study was approved for conduction. Parental information sheet and informed consent in the language the participants could understand was provided to students to be read and signed by the parents. A student's assent form was also included obtaining their permission to be a part of the study. The study doesn't

pose any risk to the participants as no surgical or medical intervention was undertaken during the study. However, as we intend to obtain personal information from the students, confidentiality was maintained. The study results were shared only amongst the investigators and the statistician. The proforma and the consent forms will be kept in Child Health Unit 3 department in locker for 5 years. Access to information will be restricted to researcher, guide and Head of the Department.

Sample size:

The international study using ASHS and ASWS shows a correlation of 0.40 for sleep hygiene and sleep patterns. (52) To detect a correlation of 0.40, we need a sample size of 47 with 5% error and 80% power. This sample size is taken to calculate the correlation only. We are interested to find the descriptive in details so we planned to take a non probability sample of 300 to study the sleep behaviour of adolescents.

Bias:

Bias is likely to occur when participants are filling the questionnaires as they tend to discuss among themselves, or may give the ideal answers, and not what they actually practice. The principal investigators, other authors, department staff were present during the session to invigilate the students preventing them to discuss amongst themselves.

Compliance and response bias is a possibility

Statistical methods:

Statistical software SPSS 16.0 will be used for data analysis. Epi data version 3.1 was used for data management.

Descriptive parameters will be presented using mean along with standard deviation. Z-scores will be calculated to see the sleep patterns, sleep quality, sleep hygiene and sleepiness.Unpaired t-test was used to compare the sleep pattern values between different age groups and gender groups for continuous variables. Chi –square test was used to compare discrete variable.Pearson correlation coefficient was used to find the relation of sleep quality and sleep hygiene, relation of sleep quality and sleep hygiene to sleepiness.

Management of missing data:

Missing observations were excluded all together from the calculations for each variable by Epi-data 3.1 data management software.

Funding for the project:

Financial support for the project was provided by Christian Medical College Fluid Research Grant.

RESULTS

*There were missing observations in each of the variables that were excluded during analysis, thus the number of participants, the "n" value under each domain varies.

I. DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS:

TABLE 4: Age distribution of study participants

Age (years)	No. of participants (%)
12	4 (1.6)
13	44 (17.1)
14	77 (30)
15	76 (29.6)
16	47 (18.3)
17	4 (1.6)
Total	257 (100)

Mean Age (SD)	14.5 (1.08)

The study population consisted of adolescents aged 12 to 17 years. Mean age was 14.5 years (SD -1.08). 59.6 % were in the age group 14-15 years.

FIGURE 6: Age distribution

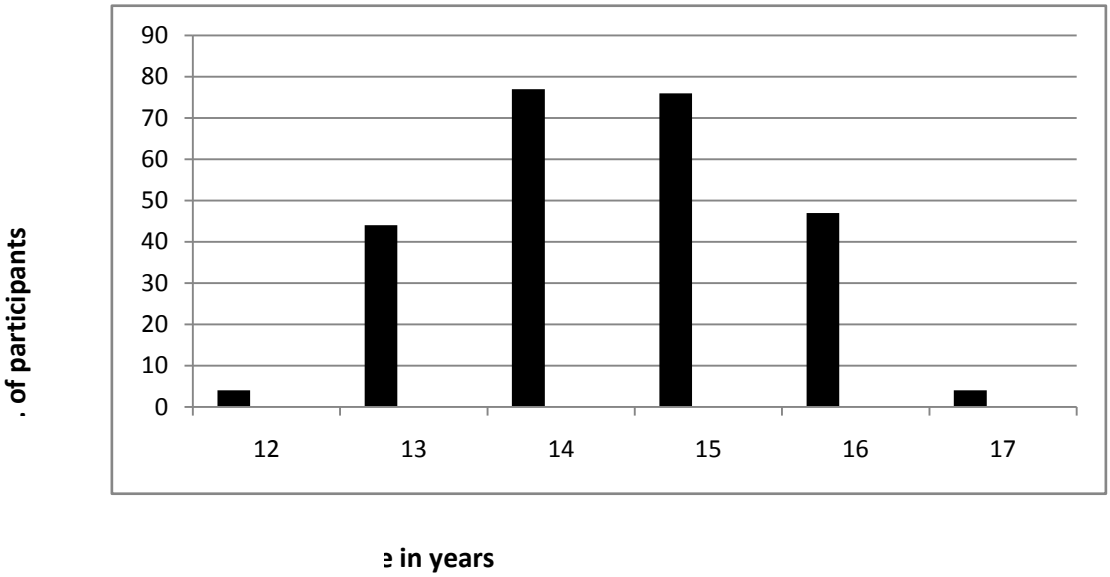


TABLE 5: Distribution of early and mid-adolescents

Group	No of participants (%)
Early adolescent	48 (18.7)
Middle adolescent	209 (81.3)
Total	257 (100)

Early adolescents consisted of 12- 13 year olds. Mid-adolescents included 14-17 year olds. 81.3% were mid-adolescents.

TABLE 6: Gender distribution

Gender	No of participants (%)
Males	86 (33.5)
Females	171 (66.5)
Total	257 (100)

66.5 % of study participants were girls.

FIGURE 7: Gender distribution

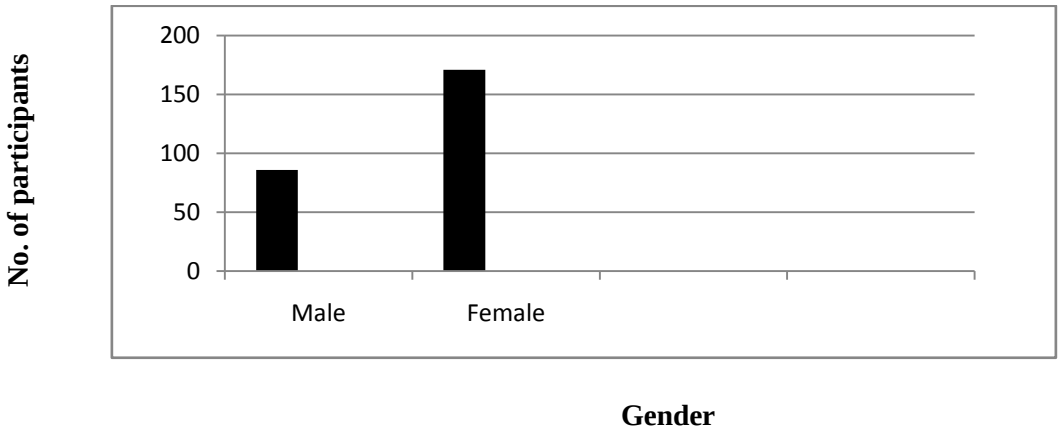


TABLE 7: Grade studying

Grade	No. of participants (%)
9th	146 (56.8)
11th	111 (43.2)
Total	257 (100)

56.8 % were 9^{th} grade students.

TABLE 8: Religion distribution

Religion	No. of participants (%)
Hindu	163 (64.4)
Muslim	74 (29.3)
Christian	15 (5.9)
Others	1 (0.40)
Total	253 (100%)

64% were Hindus.

TABLE 9: Parental occupation*

Parental occupation	No. of participants (%)
Daily wage laborer	52 (22.8)
Salaried worker	38 (16.7)
Professional	4 (1.75)
Business	4 (1.75)
Others	130 (57)
Total	228 (100)

* The highest among both parents

22.8% of the parents were daily wage laborers, 16% salaried workers. 57% were included in ‘others’.

TABLE 10: Parental education

Parental education	No. of participants (%)
Primary school	82 (33.5)
Secondary school	143 (58.4)
Graduate	13 (5.3)
Post graduate	6 (2.5)
Others	1 (0.4)
Total	228 (100)

* Highest among mother and father

58% of the parents had completed secondary school. 33% did primary school.

TABLE 11: Proportion having chronic illness or long term medication

Chronic illness/long term medication	No. of participants (%)
Yes	7 (2.8)
No	245 (97.2)
Total	252 (100%)

2.8% reported having a chronic illness or having to take long term medication

II. SLEEP PATTERNS:

TABLE 12: Weekday bedtime and waketime

Sleep parameter during Weekday	Mean (am/pm) (SD in minutes)	Minimum time am/pm	Maximum time am/pm
Bed time (hh:mm) (n=192)	9:39 pm (44)	8 pm	11:30 pm
Wake time (hh:mm) (n=187)	6:20 am (55.8)	4 am	10 am

Duringweekdays, the participants went to sleep at 9:39 pm ± 44 minutes. The earliest bedtime was 8:00 pm and the latest 11:30 pm.

On weekdays, they woke up at 6:20 am ± 56 min. The earliest wake time reported on weekdays was 4:00 am and the latest was 10:00 am.

TABLE 13: Weekend bedtime and sleeptime

Sleep parameter	Mean time am/pm (SD in minutes)	Minimum time am/pm	Maximum time am/pm
Bed time(hh:mm pm)(n=183)	9:53pm(49.2)	8pm	12 am
Wake time(hh:mm am)(n=185)	7.03am (87.6)	4am	11am

On weekends, the mean bedtime reported was 9:53 pm± 49minutes. Wake up time was 7:03 am± 88 min.

TABLE 14: Total sleep duration per day during weekday and weekend

Sleep parameter	Mean (hr, min) (SD in minutes)	Minimum (hours)	Maximum (hours)
Weekday nTST(hr, min)(n=185)	8hr, 40min (63.6)	6	13
Weekend nTST(hr, min)(n=181)	9hr, 10min (81)	6	12
Weekend nTST - Weekday nTST (hr, min)(n =177)	29 min(67.2)	(-2)*	4

nTST – night total sleep time.

Total duration of sleep was 8 hours and 40 min during a weekday.

Total duration of sleep was9 hours and 10 min during a weekend

The mean duration of sleep was 30 minutes more during the weekends than the weekdays.The minimum (-2) hours means that some of the participants had 2 hours less of sleep during the weekend when compared with a weekday.

SLEEP PATTERNS:AGE AND GENDER DISTRIBUTION

TABLE 15: Weekday bedtime vs Adolescent stage

Group	Mean (hh:mmpm)(SD in minutes)	p - value
Early Adolescents (n=27)	9 :33 (49.8)	0.50
Middle Adolescents (n=160)	9 :39(43.2)	
Total (187)		

Weekday bedtime did not vary between early and middle adolescents.

TABLE 16: Weekend bedtime vs Adolescent stage

Group	Mean (hh:mmpm)(SD in minutes)	p - value
Early Adolescents (n=27)	9:53(51)	0.88
Middle Adolescents (n= 151)	9:51(48.6)	
Total	178	

Weekend bedtime did not vary between early and middle adolescents.

TABLE 17: Weekday bedtime vs Gender

Group	Mean (hh: mm pm)(SD in minutes)	p- value
Male (n=62)	9:18(45.6)	0.00*
Female (n=130)	9:49(40.2)	
Total (192)		

Weekday bedtime differed between male and female by 30 minutes. p value was 0.

TABLE 18: Weekend bedtime vs Gender

Group	Mean (pm)(SD in minutes)	p- value
Male (n=59)	9:35(49.8)	0.00*
Female (n=124)	10.01(46.8)	
Total (183)		

Weekend bedtime difference between male and female was 25 minutes.

p value was 0.

TABLE 19: Weekday wake time vs. Adolescent stage

Group	Mean (hh:mmam) (SD in minutes)	p - value
Early Adolescents (n=27)	6:31 (50.4)	0.25
Middle Adolescents (n=155)	6:17 (57)	
Total(182)		

There was no statistical difference between the adolescent stages for weekday waketime

TABLE 20: Weekday wake time vs. Adolescent stage

Group	Mean (hh:mmam) (SD in minutes)	p - value
Early Adolescents (n=27)	7:17 (85.2)	0.32
Middle Adolescents (n=153)	6:59 (86.4)	
Total (180)		

Weekday wake time for early was 7:17 and for mid adolescents 6:59. p value 0.32

TABLE 21: Weekday wake time vs Gender

Group	Mean (hh:mm am)(SD in minutes)	p - value
Male (n=61)	6:28 (52.8)	0.20
Female (n=126)	6:16 (57)	
Total (187)		

Weekday wake time for boys was 6:28, for girls 6:16.

TABLE 22: Weekend wake time vs Gender

Group	Mean (hh:mmam)(SD in minutes)	p - value
Male (n=59)	6:58 (75)	0.61
Female (n=126)	7:05 (93)	
Total(185)		

The weekend wake time for boys was 6:58, for girls 7:05. p value – 0.61

TABLE 23: Total sleep time during weekday vs adolescent stage

Group	Mean (hr, min) (SD in minutes)	p - value
Early Adolescents (n=27)	8hr, 58min (64.8)	0.13
Middle Adolescents (n=153)	8hr, 38min (64.2)	
Total (180)		

There is a no statistical difference between TST for early and middle adolescents

TABLE 24: Total sleep time during weekend vs adolescent stage

Group	Mean (hr, min) (SD in minutes)	p - value
Early Adolescents (n=27)	9hr, 24min (90)	0.34
Middle Adolescents (n=149)	9hr, 7min (79.2)	
Total (176)		

Total sleep time was 9hr, 24min for early adolescents and 9hr, 7min for mid adolescents. p value 0.34.

TABLE 25:Total sleep time during weekdays vs Gender

Group	Mean (hr, min) (SD in minutes)	p - value
Male (n=61)	9hr, 10min (57.6)	0.00*
Female (n=124)	8hr, 26min (61.8)	
Total (n=185)		

Totla sleep time for boys was 9hr,10min and for girls 8hr, 26min. * p value- 0.00

The difference between the genders in total sleep time during weekday was statistically significant.

TABLE 26: Total sleep time during weekend vs gender

Group	Mean (hh:mm hours)) (SD in minutes)	p - value
Male (n=58)	9:23 (71.4)	0.13
Female (n=123)	9:04 (84.6)	
Total	181	

There is no statistical difference between TST of males and females

III. ASSESSMENT OF SLEEP QUALITY

TABLE 27: Insufficient sleep vs weekday or weekend

	No of participants with nTST< 8 hours (%)
Weekday (n=202)	32 (15.8 %)
Weekend (n=199)	21 (10.5%)

15.8 % of adolescents reported insufficient sleep during weekdays and 10.5 % during weekends.

TABLE 28: Adolescent Sleep Wake Scale total and subscale score

ASWS Scale (n=238)	Score Mean (SD)
Going to bed	3.94(1.22)
Falling asleep	4.47(1.38)
Maintaining sleep	4.22(1.43)
Reinitiating sleep	4.57(1.31)
Returning to wakefulness	4.05(1.36)
ASWS total	**4.25(1.16)**

*Scale of 1-6

All subscale scores and the total ASWS mean score ranged between 3.9-4.57.

TABLE 29: ASWS total score vs adolescent stage

Group	Mean ASWS score(SD)	p - value
Early Adolescents(n=41)	4.3 (0.5)	0.8
Middle Adolescents (n=192)	4.2 (0.7)	

ASWS total score was 4.3 for early and 4.2 for mid-adolescents

TABLE 30: ASWS total score vs gender

Group	Mean (SD)	p - value
Male (n=83)	4.07 (1.5)	0.09
Female (n=155)	4.35 (0.8)	

ASWS total score was 4.07 for males and 4.35 for females

TABLE 31: Other sleep quality parameters (ASWS)

Sleep parameter	No of participants (%)	
Sleep onset latency (n=207)	≥30 min	< 30 min
	49 (23.7)	158 (76.3)
Nocturnal awakening (n=221)	≥ 3times	< 3times
	35 (15.8)	186 (84.2)
Time taken to reinitiate sleep (n=212)	≥ 30 min	< 30 min
	29 (13.7)	183 (86.3)
Time taken to feel awake after waking up (n=224)	≥15 min	<15 min
	35 (15.6)	189 (84.4)

23.7% took more than 30 minutes to fall asleep after going to bed.

84.2% woke up less than 3 times at night.

After waking up at night, 86.3% participants went back to sleep within 30 min.

84.4 % felt fully awake by 15 minutes when waking up in the morning.

IV. SLEEP HYGIENE ASSESSMENT

TABLE 32: Adolescent Sleep Hygiene Scale (ASHS) total and domain scores

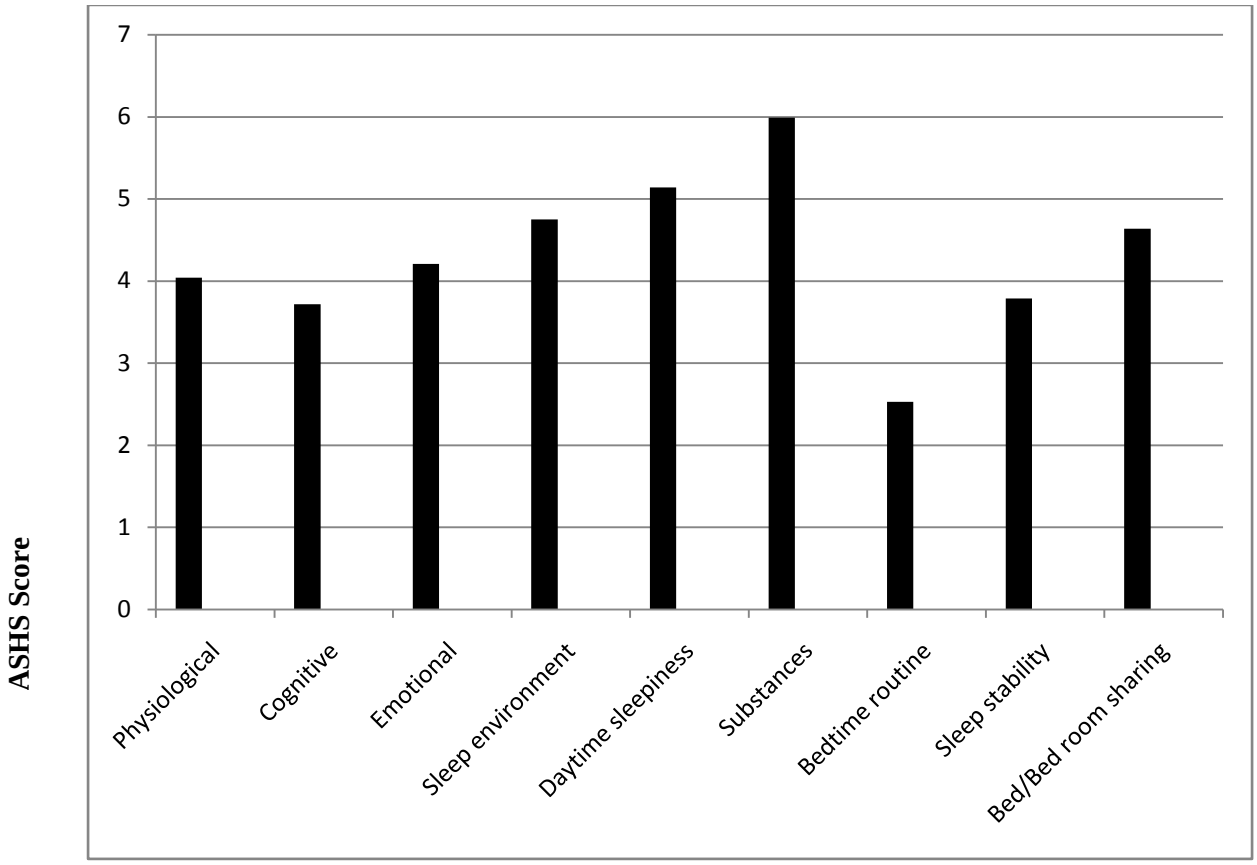
ASHS Domain (n=238)	Score Mean (SD)
Physiological	4.04(1.07)
Cognitive	3.72(1.15)
Emotional	4.21(1.28)
Sleep environment	4.75(1.15)
Daytime sleep	5.14(1.26)
Substances	5.99(0.10)
Bedtime routine	2.53(1.85)
Sleep stability	3.79(1.64)
Bed/bedroom sharing	4.64(1.32)
ASHS total (n=235)	**4.29(0.79)**

*On a scale of 1-6

Mean of the total ASHS score was 4.29 for the study population.

Cognitive domain had a mean score of 3.72, sleep stability 3.793, bedtime routine domain (forward coded) 2.53, daytime sleep 5.14, substance use 5.14

FIGURE 8: Mean of total ASHS score e of participants.



*Bedtime routine: This is the only domain which, if the participant has a lower score , it is indicative of better sleep hygiene. (Reverse coded)

TABLE 33: Sleep Hygiene (ASHS total score) vs Adolescent stage

Group	Mean (SD)	p - value
Early Adolescents (n=41))	4.7 (0.5)	0.08
Middle Adolescents (n=192)	4.5 (0.5)	

Mean of total ASHS score was 4.5 forearly, 4.7 for mid adolescents

TABLE 34: Sleep Hygiene (ASHS total score) vs Gender

Group	Mean (SD)	p– value
Male (n=83)	4.3 (0.5)	0.81
Female (n=155)	4.3 (0.6)	

Mean of total ASHS score was around 4.3 for both males and females.

V. RELATIONSHIP BETWEEN SLEEP QUALITY AND SLEEP HYGIENE

Table 35: Correlation between total and subscales of ASHS and ASWS

ASWS subscales	ASHS Domains									ASHS Total
	Physio logical	Cogn-itive	Emo-tional	Sleep envir-onment	Day time sleep	Substan use	Bed time routine	Sleep Stability	Bed/ bed room sharing	
Going to bed	**0.41**	**0.55**	**0.34**	**0.44**	**0.31**	-0.00*	0.03*	**0.33**	0.10*	
Falling asleep	**0.39**	**0.40**	**0.36**	**0.50**	**0.37**	0.08*	0.06*	**0.36**	**0.16**	
Maintaining sleep	**0.31**	**0.38**	**0.37**	**0.43**	**0.34**	0.07*	0.10*	**0.33**	0.05*	
Reinitiating sleep	**0.40**	**0.44**	**0.39**	**0.43**	**0.39**	0.01*	0.05*	**0.37**	0.06*	
Waking up	**0.40**	**0.50**	**0.43**	**0.40**	**0.32**	0.03*	0.02*	**0.45**	0.11*	
ASWS Total	**0.44**	**0.52**	**0.43**	**0.50**	**0.40**	0.04*	0.06*	**0.43**	0.12*	**0.63**

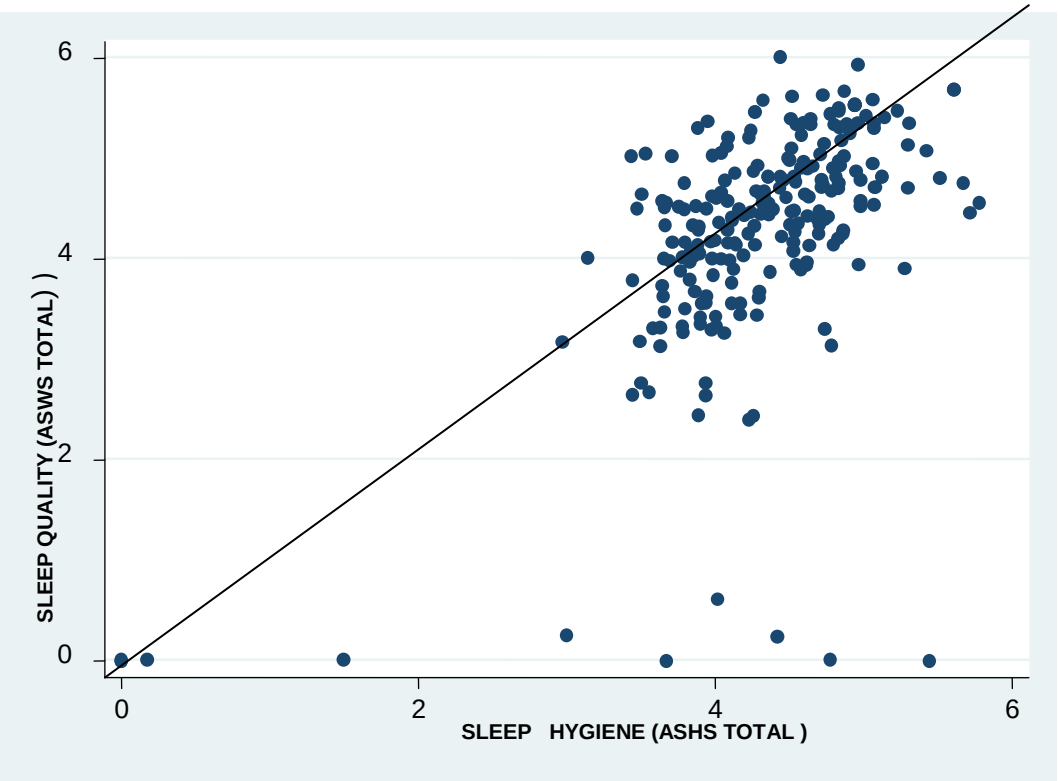
(All correlation coefficients (r) were statistically significant ($p<0.05$) except those with *)

Overall correlation coefficient between sleep quality and sleep hygiene was 0.63.

Cognitive domain of ASHS has a correlation coefficient of 0.52 with total ASWS. Sleep environment of ASHS had a correlation of 0.50 with total ASWS.

Bed time routine, substance use and bed/bed room sharing domains of ASHS had correlation coefficients of ≤ 0.1 with total ASWS All the sleep hygiene domains had good correlation with sleep quality subscales (r≥ 0.3)

FIGURE 9: Scatter plot diagram showing relationship between total ASHS and ASWS scores



*r = 0.63

The scatter plot demonstrates moderate to strong linear relationship between sleep hygiene (ASHS total score) and sleep quality (ASWS total score).

VI. SLEEPINESS

TABLE 35: Sleepiness score in participants

	Mean (SD)	Minimum	Maximum
Total sample (n=257)	5.45 (4.51)	00	21

The mean score with Epworth sleepiness score was 5.45. (Minimum is 0 and maximum 21).

TABLE 36: Proportion of students with sleepiness level

Sleepiness level (scores)	No of participants (%)
No sleepiness (0-10)	227 (88.3)
Mild sleepiness (11-14)	14 (5.5)
Moderate sleepiness (15-18	8 (3.1)
Severe sleepiness (>18)	8 (3.1)
Total	257 (100)

Sleepiness was reported in 12% of the study population.

88% reported no daytime sleepiness at all, 6.2 % reported moderate to severe sleepiness.

FIGURE 10: Level of sleepiness in the study population

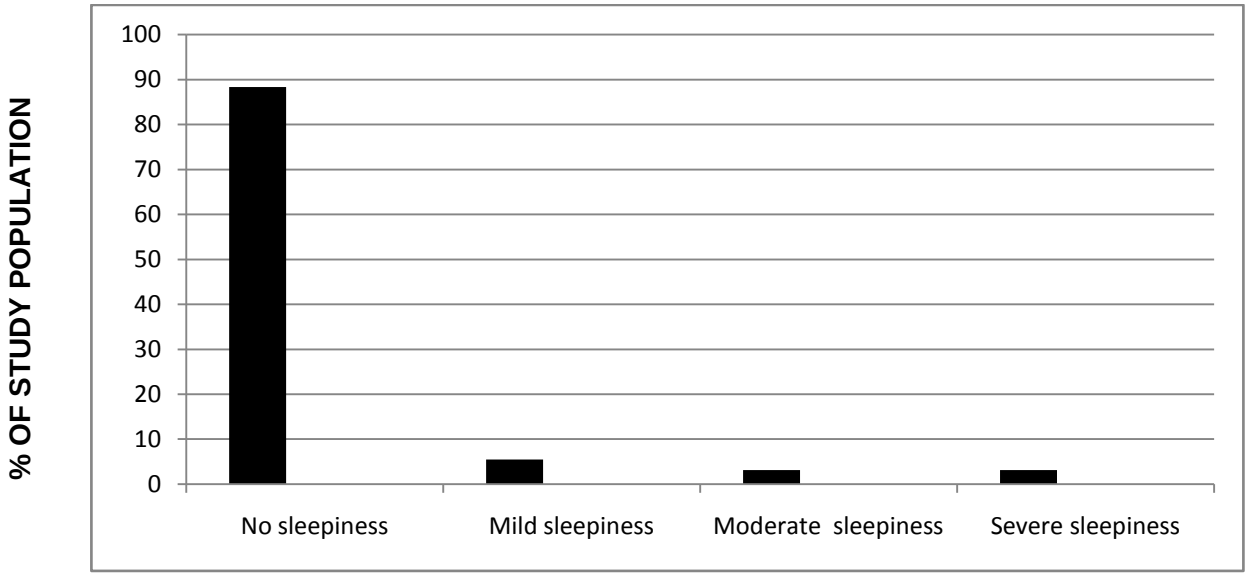


TABLE 37: Sleepiness distribution vs Adolescent stage

Group	No of participants (%)		
	No sleepiness (score $\leq$ 10)	Sleepiness (score >10)	p value 0.16 (one-tailed p value =0.06)
Early adolescents (n=39)	37 (94.8)	2 (5.1)	
Mid adolescents (n=186)	160 (86)	26 (13.9)	

5% of early adolescents reported sleepiness, while 14% of middle adolescents reported sleepiness. The difference was not statistically significant however.

TABLE 38: Sleepiness distribution vs Gender

Group	No of participants (%)		
	No sleepiness (score $\leq$ 10)	Sleepiness (score >10)	p value 0.08
Boys(n=78)	64 (82)	14 (17.9)	
Girls (n=152)	137 (90.1)	15 (9.9)	

Sleepiness among boys was 18% and among girls was 10%. (p value 0.08)

TABLE 39: Sleepiness score vs Adolescent stage

Group	Mean (SD) Time	p - value
Early Adolescents (n=39)	4.21 (3.49)	0.05
Middle Adolescents (n=186)	5.87 (4.71)	

Sleepiness score was 4.2 and 5.9 for boys and girls respectively.

TABLE 40: Sleepiness score vs Gender

Group	Mean (SD) Time	p - value
Male (n=78)	6.14 (5.21)	0.63
Female (n=152)	5.34 (4.18)	

Sleepiness score was 6.1 and 5.3 for boys and girls respectively

TABLE 41: Correlation coefficients for Sleepiness score and ASHS and ASWS total scores

	Sleepiness
ASWS total score	**-0.30**
ASHS total score	**-0.23**
ASHS Domains	
Physiological	-0.20*
Cognitive	-0.24
Emotional	-0.21
Sleep environment	-0.10*
Daytime sleep	-0.24
Substances	-0.02*
Bedtime routine	0.13*
Sleep stability	-0.28
Bed/bedroom sharing	-0.03*

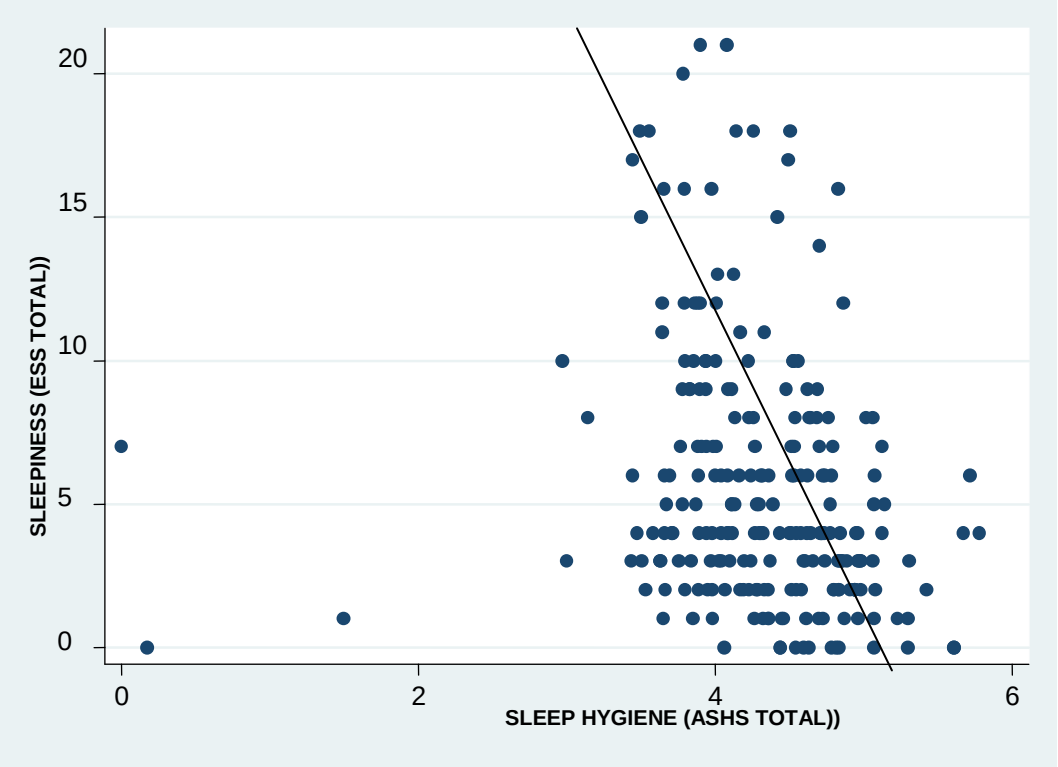
(p value was<0.05for all except those with *)

Sleepiness and sleep quality (r= -0.30) and sleep hygiene (r= -0.23) have weak inverse relationship.

Physiological, sleep environment, substance use, bed time routine and bed room sharing do not correlate with sleepiness.

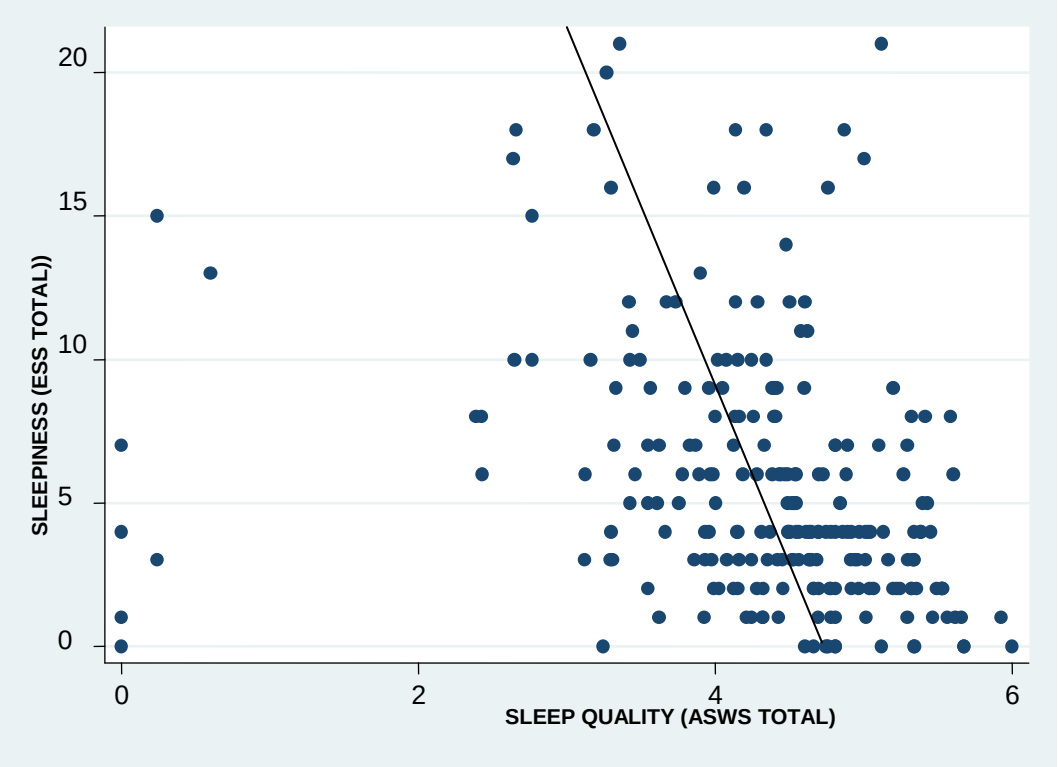
Cognitive, emotional, day time sleep and sleep stability show weak correlation to sleepiness.

FIGURE 11: Scatter plot showing relationship between sleep hygiene (ASHS total) and sleepiness (ESS total)



* r = (- 0. 23)

FIGURE 12: Scatter plot showing relationship between sleep quality and sleepiness



*r = (- 0.30)

DISCUSSION

Adolescent sleep has been described as a ‘perfect storm’. Sleep scientist Mary Carskadonexplains thatthere is a clear mismatch between the biological and social aspects of sleep among adolescents. The number of hours of sleep required for teenagers is lesser than that for younger children. However, the actual duration of sleep among this group is far below the recommended hours. Therefore sleep needs persist throughout adolescent period. The reasons are several. The adolescent biological clock is set in such a way, that they sleep later in the night and wake up later in the morning. Meanwhilethere is increasing academic and social demands that compromise sleep. Consequences of sleep deprivation can be grave and wide spread affecting academic performance, mental health, physical health as well as safety on the road.(27)

In the present study we attempted to describe the sleep habits and sleep related behavior of teenagers in our community.

I. Demographic Characteristics

The total sample included 257 students from three different schools in Vellore city. Mean age in our population was 14.5 years. Sample included a higher proportion of girls, as one of the 3 schools was a girls only school. Fifty six percent of the participants were from the 9^{th} grade, the rest from 11^{th}

grade.Majority of the participants were Hindus, which is reflective of the national population. To describe the socioeconomic status of the study population, we included the highest occupation and education among both mother and father. A majority of the parents had completed secondary education. Assessment of occupation was unreliable as the majority (57%) marked the response“others”, which was unspecified. The study population includedadolescents mostly from a lower socioeconomic status. Prevalence of chronic illness or long term medication that might affect sleep quality was 2.8%.

II. Sleep patterns

On week days teenagers in our study went to bed on an average at 9:39 pm ±44 min. The average wake up time was 6:20 am ± 56 min. During weekends they went to bed at 9:53 ± 49 pm. Hence on weekends, they went to bed only 14 minutes later than during a weekday.

During weekends on an average, adolescents reported waking up at 7:03 am ± 88 min. This was about 43 later than weekday wake time.

During weekdays, the average total sleep duration was 8 hours and 40 min with SD of 64 minutes. During weekends total sleep duration was 30 minutes more than the weekdays.

The optimal sleep duration may vary between individuals and between different days for the same individual. Current available evidence is inadequate to define what should be adequate or optimal sleep duration for adolescents.(88) Recommendations are largely based on expert opinions without much of consensus statements about how these recommendations were formulated.(88) According to the recommendations by the US National Sleep Foundation 2015, teenagers 10 -13 years old should sleep 9-11 hours a day, while 14-17 year olds need 8-10 hours of sleep a day, with an acceptable lower limit of 7 hours(60). Most adolescents in the study population reported adequate sleep duration.

School start time in most countries is between 7:30 and 8:30 am(28,32). Students might have to wake up between 6:30 and 7:30 am in order to attend classes. Sleep duration has been conventionally recommended as 9 hours, hence they must go to bed before 10:30 pm. A majority of the adolescents in our study slept around at 9:39 pm. The SD being 44 minutes, the sleep time may vary frrm around 8 pm to 11:10 pm. (2 SD). This means that if children whose bedtime falls within one SD (10:20 pm) will get enough sleep as per recommendation, but children with bedtime outside one SD are at risk of insufficient sleep.

It has been is demonstrated in comparative studies that, self reported sleep durations are usually, over- estimated as compared to objective methods like actigraphy(89). In some studies, this overestimation was as high as one hour(89),

hence the actual bedtimes may have been later and the sleep duration even shorter than what was reported.

A study of sleep patterns was conducted by Gupta et al in urban schools in north India, with a similar age profile(mean age was 15.1 years). They reported an average total sleep duration of 7.8 hours. Most of the adolescents (41.5 %) in their study went to be by 11pm, sleep onset latency (time taken to fall asleep after getting into bed) was reported to be 23 minutes; they required 10 minutes to leave bed after waking up. Total sleep duration in our study did not include sleep onset latency, time spent in nocturnal awakenings and time to leave bed after waking up. Studies have demonstrated that sleep onset time is a better parameter to measure as compared to bed time. On an average sleep onset time has been found to be 16 minutes later than bed times for 15-16 year old adolescents.(32) If this was taken into account, the estimated sleep duration in our study would further reduce. One fourth of adolescents in our study population needed more than 30 minutes to fall asleep after getting to bed. Most of them (86.3%) spent less than 30 minutes in nocturnal awakenings and most (84.4%) felt fully awake 15 minutes after waking up in the morning.

A meta-analysis of several studies on sleep patterns of adolescents from USA, Germany, Canada, Switzerland, Norway, Italy, Iceland, Belgium, France, Taiwan, China, Hong Kong, Japan, Korea and Australia was carried out by

Gradisar et al. This meta-analysis revealed that weekday bed time for adolescents ranged from 8:46 pm to 12:54 am. Most of them belonged to <15 year age group. About 50% of them had the recommended optimal sleep of 9 hours duration. One third of them being older (15-16 years) had borderline bedtimes. Korean adolescents had the latest bedtime making them prone for the effects of sleep deprivation(81) Reasons cited for insufficient sleep among Korean students' were internet, early school start time, and also excessive after-school classes in school or tutoring in institution to keep pace with a highly competitive educational environment.(45)This is typical of the Indian scenario also, where school students are under severe pressure to perform well in academics. Weekend bed times were even later (mean difference =122.3 min) as reported in 13 studies.(81)

Total sleep time ranged from 6.5 to 9.5 hours, lowest in adolescents from Hong Kong. Asian adolescents from China, Korea, Taiwan and Hon Kong, had significantly less total sleep time as compared to their European counter parts, but similar to North American adolescents.(81) In most of the studies, adolescents reported sufficient sleep over the weekends.

The difference between weekday and weekend sleep duration indicates the amount of sleep debt during weekdays which they compensate by sleeping longer during the weekends. An average difference of 1.5 hours in the total sleep time between weekdays and weekends was observed in adolescents in North America, Europe and

Asia.(81)Adolescents in our study population reported only a 30 minute difference between weekday and weekend.

The wake up time on weekdays for adolescents across several countries ranges between 5:50am to 8:10 am. The earliest wake-time was reported from China as these children participated in exercise at 6:15 am before school.(81) The weekend wake time was on an average 2 hours 31 minutes later than weekday wake up time.(81)

Early versus middle adolescents:

Early and middle adolescents were compared for various sleep parameters in our study. There was no significant difference between the groups, in weekend and weekday bedtime and wake-time or total sleep duration over weekday and weekend. The difference between weekend and weekday total sleep duration was 26 and 29 minutes for early and middle age adolescents. There was a difference noted between the 2 groups with regard to weekend wake-time. During the weekends, early and middle adolescents woke up 46 minutes and 42 minutes later respectively as compared to weekdays. The delayed wake time on weekends may be due to various factors. The study among school going adolescents in north India revealed that the total sleep time reduced significantly from 9^{th} to the 11^{th} grade.(37) Increasing academic pressure with higher grades

seems to be a good explanation for this transition, but needs to be further investigated.

Studies in India as well as in other parts of world clearly demonstrate that as age advances, bedtime become later and wake time becomes earlier, and total sleep time becomes shorter.(37,45,81)

Our study did not show such age wise difference between different age groups possibly because all the above studies had a larger population under study.

Sleep versus gender

Boys fared well when compared to girls with regard to certain sleep parameters, in our study. Girls reported significantly later bed times when compared to boys. Girls slept 31 minutes later on weekdays and 26 minutes later on weekends. ($p=0.00$). The wake-time was the same for both boys and girls; however the weekend and weekday wake-time difference for girls was as high as 50 minutes as compared to 30 minutes for boys. During the school days, girls slept about 44 minutes less at night as compared to boys ($p=0.00$). The weekend and weekday difference of total sleep duration was only 13 minutes for boys where as it was about 40 minutes for girls. Our study indicated that girls slept less when compared to boys. However sleep quality and daytime sleepiness were similar for both. This could be explained by more household chores for girls than for

boys as they grow older. Gupta et al in north India did not report such gender differences for sleep parameters .(37)Chinese adolescent girls had insufficient sleep duration during weekdays when compared to boys. This difference was statistically significant being 47% boys had insufficient sleep and 55% of the girls had insufficient sleep. Similar difference was observed in among Spanish male and female adolescents aged 13–18.5(43)

III. Sleep quality

Our adolescents seemed to have good quality sleep. On a scale of 1-6, mean total score was 4.25 and the mean scores for each ofthe subscales were more than 4 indicating a reasonably good quality of sleep.Although, there are no cut off values defined for differentiating good quality sleep from bad. Early and middle adolescents and boys and females reported similar scores on the ASWS scale.

Other studies have taken into consideration various sleep parameters to assess sleep quality among adolescents such as, sleep onset latency, frequency of nocturnal awakenings, time spent during nocturnal awakening, wake time after sleep offset. These parameters are represented in the subscales of ASWS.

Waking up while asleep

In our study, 65% of the participants reported nocturnal awakening, 16% had nocturnal awakening ≥ 3 times. The majority (74%) who woke up went back to sleep in < 15 minutes, about 14% reported taking> 30 min to go sleep.

Gupta et al reported that 37% of adolescents reported nocturnal awakening, with a mean of 1.6/night, spending about 17minutes awake per night. The percentage of adolescents reporting nocturnal awakening was higher, but the average number of nocturnal awakenings and time spent awake was similar. Various reasons like thirst, toilet needs, pain or cramps, bad dreams and environmental factors were reported(37). Nocturnal awakening may be physiological that vary with age, normally occurring at the end of each sleep cycle of 90-120 minutes in which the person goes back to sleep without difficulty.(90)Various reasons such as environmental factors including noise, light, uncomfortable bed can cause nocturnal awakening. It may also be a manifestation of sleep related breathing disorders like periodic leg movement depression, insomnia or stress.(37,90)

Gupta et al reported a sleep latency of 23-25 minutes in different grades and time taken to leave bed after being awake (Wake time after sleep offset) was about 9-10 minutes (37).In our study, about 64% of the adolescents reported a sleep onset within 15 minutes of getting into bed. For 15-18 year old

adolescents, average sleep onset time reported by several authors wasabout 17 minutes(81) Most of our participants reported felt fully awake by 15 minutes of being awake similar to participants in study in northern India by Gupta et al.

A study done in Australia that included 385 adolescents aged 13-18 years reported that adolescents had difficulty in initiating sleep and had sleep which was not refreshing. Longer sleep onset latency and short sleep duration adversely affect their daytime functioning. Pittsburg sleep quality index(PSQI) was used to assess sleep quality in 757 high school students in Taiwan. PSQI uses a cut-off score of 5 to differentiate good quality sleep from poor. All the participants reported a score of >5 with worse scores in higher grades, indicating poor quality sleep. A common reason reported by this population was use of internet, social network sites and online games(50).

The Adolescent sleep wake scale (ASWS) was used to study sleep quality among Italian and American adolescents by LeBourgeois et al. They reported mean score about 4.5 for both the populations. They observed a significant statistical difference in the ASHS scores of Italian and American adolescents after controlling for various confounders. This was explained by cultural differences between the 2 groups that might determine sleep quality. Parental involvement among early adolescents in Italy was considered a significant factor

for better sleep quality.Several sleep hygiene aspects have been correlated to sleep quality in their study. (52)

IV. Sleep hygiene and its relationship with sleep quality

We investigated the sleep hygiene using a multi-dimensional scale Adolescent sleep hygiene scale (ASHS). Overall, the students reported good sleep hygiene practices. When correlated with various factors of sleep quality and overall sleep quality, there was moderate to strong relationship (r=0.63). This emphasizes the importance of following good sleep hygiene practices in adolescents.

In our study, adolescents had lower scores on the cognitive domain (mean = 3.7) and it had a better correlation to sleep quality (r=0.52) than other domains. This finding could suggest that adolescents in the study population were watching television or using other electronic media closer to bedtime. Getting involved in activities like watching television, talking on telephone or playing video games which could cause an excessive stimulation of the senses and general alertness of the brain, during one hour before going to bed or using electronic media while on bed can adversely affect sleep quality(13,76,77). A recent survey reported that more than half (56%) of 13-18 year adolescents were texting messages almost every night during the hour before bedtime and 28% had the cell phone nearby with the ringer turned on while sleeping.(91)

In our study we found that children reported lower level of sleep schedule stability (mean score =3.79) which means that children were not consistent in their sleep schedules. When parents set bed times for children, they had earlier and stable bed times and reported to have a better sleep quality(91). This may be one of the reasons why younger adolescents have better sleep quality as parents are more commonly involved in setting bedtimes in younger adolescents(59). Sleep stability was associated with sleep quality, (r=0.43), underscoring the importance of following a regular sleep schedule and higher parental involvement in setting the sleep schedule for adolescents. In a study done by Manber et al 39 college students with irregular sleep students were recruited for a four week intervention of regular sleep. This exercise resulted in markedly reduced daytime sleepiness in the subjects.(78).

Substance use and sleep

A high score for substance use (mean -5.99) indicates that the participants used less of substances like alcohol and tobacco in the evening. This may be related to overall use of alcohol and tobacco in the region amongst adolescents. Substance use was not significantly related to sleep quality, however, the sample size is small and therefore may not be a significant negative correlation.

A factor analysis of ASHS tool showed lack of variability in the questions regarding substance use, so they were removed from the revised ASHS tool(91).

However, both acute and chronic use of nicotine is known to affect sleep quality adversely(78). Alcohol use in non habituated individuals close to bedtime can affect sleep in night.(78) Given this fact, it is likely, that the questions failed to signify the relationship between sleep quality and substance use even if exists.

Daytime naps

.A higher score (mean – 5.14 on a scale of 1-6) on the daytime sleep domain suggests that the participants did not nap more than 1 hour during the day. Daytime napping is a socially accepted practice in Asian culture.(37,92) A review of literature regarding daytime napping revealed that naps of <30 minutes were beneficial. Excessive daytime napping is not beneficial. It is not associated with good quality nighttime sleep.(78).It can be indicative of excessive daytime sleepiness.(37,45)

Bedtime routines

Bedtime routine differs from one society to another. In the anglo-european culture a bedtime routine would include a set of activities like bathing, putting on special clothes, singing, storytelling etc. , This routine is generally followed to facilitate a child's sleep by a gradual reduction of environmental stimuli, leading to a comfortable and safe feeling before a child is left alone in the bedroom. In other cultures like in Italy, such a bedtime routine is not encouraged; this is to enable a child to acquire the capacity to sleep under any circumstance as observed by Owen.(92). Bedtime

routinefactor did not have a good correlation with any of the sleep domains in our study. Re evaluation of psychometric properties like validity and reliability of ASHS later revealed that bed time routine had a low convergent validity. Convergent validity of ASHS was checked with school performance and behavioural problems. Following a bedtime routine should lead to less behavioral problems and better school performance as it is presumed to improve sleep. But practically, it did not correlate well with the school performance and behavioural problems..It did not correlate with most of the other factors of sleep quality. It was therefore removed in the revised ASHS(79). Thiscould explain the lack of relation between bedtime routine and sleep quality in our study.Bedtime routine was not significantly associated with sleep quality parameters in studies conducted among American and Italian adolescent population.(52)

Sleep environment

Sleep environment also varies from one geographical region to another; and within one region, between families belonging to different socioeconomic strata. The availability of a congenial environment for a comfortable and undisturbed sleep is clearly subject to the type of society our adolescents are living in. (92)LeBourgeois MKet al in their comparison between Italian and American adolescents reported that not sleeping in a hot, noisy environment and not sharing a bed or bed room were associated with better sleep quality in American adolescents but did not affect sleep in Italian

adolescents(52). Foradolescents in our study, sleep environment moderatelycorrelated with sleep quality. The study participants reported to get a comfortable environment which is neither too hot or cold, nor excessively lighted and noisy as indicated by a mean of 4.75 on a scale of 1-6.

Drinking a caffeinated beverage close to bedtime can affect sleep quality; but the correlation is observed only with consumption of moderate to high amounts of caffeine(78). Adolescents in our study did not have such practices as suggested by a higher score in physiological domain. (mean score=4.04) Physiological domain assessed consumption of caffeinated beverages close to bedtime, going to be with hunger or stomachache, and drinking more water close to bedtime that gives rise to toilet needs during night leading to disturbed sleep.

Among American and Italian adolescents using ASHS, it was observed that cognitive and emotional factors had a strong correlation with sleep quality. A similar correlation is present in our study(52). A study conducted in Canada revealed that not following a bedtime routine, staying up late, drinking caffeinated beverages after 6 pm, all had a significant correlation with poor sleep quality and daytime sleepiness.(4)

Parameters of sleep quality in our study are similar to that reported in other parts of the world. Factors affecting sleep and sleep hygiene practices may differ among different cultures. These cultural difference need to be taken into account when comparing

pediatric sleep problems across different regions as well as making recommendations for improving sleep quality

V. Sleepiness

In our study, more than one tenth(11.7 %) of all participants reported daytime sleepiness. On comparing the different age groups,about 5% in the early adolescent group reported sleepiness but a larger 14% in the mid adolescent group reported daytime sleepiness.(one tailed p=0.06). Twice the proportion of adolescent boys (18%) reported daytime sleepiness when compared to adolescent girls(9.9%) (p=0.08). Gupta et al in their study among adolescents in an urban region in north India reported daytime sleepiness among 37% of 9^{th} grade students and 54% amongst 12th grade students (p=0.001)(37). .

Rhie S et al in Korea used the Pediatric daytime sleepiness score (PDSS) among school going children. They report that scores gradually increased from 5^{th} grade students to the 12th grade students. Naptime in school increased from 12 minutes among students in 5th6th grades, to about an hour among students in 10 -12 grades. This indicates a significant duration daytime sleepiness among older adolescents. They also reported an inverse relationship between night sleep duration and daytime sleepiness scores(45).It is a logical conclusion that adolescents who slept inadequately during the night had more daytime sleepiness. Chen T-Y et al in their study among high school students in Taiwan observed that

30% of their study population had daytime sleepiness(50). In a study done in Canada using Epworth sleepiness scale in Canada, 42 % of high school students had daytime sleepiness. The authors also observed a significant relationship between participants who had sleepiness also had poorer grades in academic performance, being late in reaching school and decreased participation in sports and other extracurricular activities(4).

A world-wide meta analysis of daytime sleepiness levels among adolescents revealed that 52% of Asian adolescents reported day time sleepiness, with one-third(33.3%) of boys and 39% of girls reporting sleepiness during the day. Whereas in Europe only about 6% had daytime sleepiness.(81) Using the same Epworth scale, 16% of the adolescents in Korea and 42% of those in Hong Kong had daytime sleepiness.(81)

Correlation between sleep hygiene, sleep quality and sleepiness

Sleepiness can be a manifestation of chronic sleep deprivation (36,81). We attempted to see the relationship between various sleep hygiene practices using ASHS and sleep quality using Epworth sleepiness scale. There was a weak to moderate correlation between sleep hygiene score and daytime sleepiness scores (r= -0.23). And there was a weak correlation between sleep hygiene and sleep quality (r= -0.30). This indicates that in our population, sleep hygiene had a role in determining the level of daytime sleepiness. Better the reported sleep hygiene

and sleep quality, lesser the sleepiness among the adolescents. A larger sample size might reveal a different association.

In our study population, physiologically enhancing activities like having caffeinated drinks close to sleep, a comfortable sleep environment, using tobacco and alcohol, following a bed time routine and bed room sharing did not affect sleepiness level. This observation can have several reasons. It is a possibility, that the power of study being small, the effect of these factors on sleepiness could not be detected even if it actually exists. Moreover, insufficient sleep and poor sleep hygiene is not the only reason for daytime sleepiness in adolescents. There may independent or co-existing factors that result in daytime sleepiness like mental illnesses such as depression, sleep disorders like obstructive sleep apnea, insomnia, narcolepsy, or intake of medications or stimulants(93). These factors were not assessed in our study population. Doing activities that keep you awake before bedtime, daytime sleep and following irregular sleep schedule had some inverse correlation with sleepiness level in our population. (r= .0.2)

For high school students in Canada, several sleep hygiene practices played an important role in reducing level of daytime sleepiness. Following a bedtime routine, staying up late and drinking caffeinated beverages after 6 pm were

significantly associated with daytime sleepiness. Quantity of sleep during weeknights was protective against sleepiness (OR=0.59, p=0.0001)..(4)

In summary, adolescents in our community report good sleep quality and sleep hygiene practices. They had a lower level of daytime sleepiness, contrary to findings from other parts of the country and world. These findings can be explained by their socioeconomic status. A majority of our study population belonged to a lower socioeconomic status where families generally slept earlier and woke up earlier than the general populace. Access to electronic gadgets and TV might have been less.

Strengths of the study

Our study is one of the first attempts to assess sleep parameters in the southern region of this vast country. Also the study population were mostly adolescents from the lower socioeconomic strata of society which is also for the first time in the country to best of our knowledge. We assessed various aspects of sleep hygiene practice. It helped us to identify specific habits of our adolescents which would help us understand and so educate them about trying to achieve better sleep quality. A comprehensive assessment of sleep quality was done in a multidimensional way. An attempt was made to see if sleep hygiene factors were an important determinant of sleep quality and level of daytime sleepiness in our adolescents. In our study, we used standard tools like Adolescent Sleep Wake

Scale, Adolescent Sleep Hygiene Scale and Epworth Sleepiness Scale and translated into the vernacular language. This helped in comparing our findings with studies conducted in other countries.

LIMITATIONS:

1. The tools used were self reported questionnaire. Hence the understanding of individual questions was dependent on the participants' level of cognition.

2. The close proximity with each other may have enabled them to discuss answers.

3. Adolescents because of their developmental stage were likely to have exaggerated their response towards what would have been the ideal answer.

4. The big number of questions -63 might have been tedious for the students to complete.

5.The current sample is a non probability sample hence the results cannot be generalized to the entire population.

6. There are no cut off levels used as to define severity of poor sleep quality using these questionnaires.

7. These questionnaires are yet to be validated in our population.

8. There were no older adolescents in this sample.

9. Adolescents from higher socioeconomic status did not feature in this sample

10. The translation into vernacular language was done by experts proficient in both English and Tamil; however there may be subtle cultural difference which may have been overlooked

FUTURE DIRECTIONS FOR RESEARCH IN THIS FIELD:

There are several areas where further research can be done. Studies in future can be undertaken to cover a representative sample of the general population. More of such observational data is required in demographically and geographically different parts to give a complete picture of sleep patterns and quality of Indian adolescents. More objective methods can be used to assess sleep in our population. Also there is a need to validate the subjective tools in our study against objective gold standards for our population. A concise version of Adolescent sleep wake scale with only 10 questions designed by Essner et al can be validated for better compliance in further observational studies.(94) Various consequences of sleep deprivation in our population like effect on academic performance, obesity and cardiovascular health, mental health needs to be assessed. Parental involvement in sleep assessment will give a more comprehensive assessment of sleep.

The results of our study add to our knowledge of sleep patterns and sleep related behaviour of adolescents in our country.

CONCLUSIONS:

1. Sleep patterns of school going adolescents in Vellore had several similarities when compared to practices followed by adolescents in the rest of the world.

2. Self reported sleep hygiene practices of school going adolescents was good.

3. Self reported sleep quality of school going adolescents was reasonably good.

4. 11.7 % of school going adolescents reported daytime sleepiness..

5. Sleep quality and sleep hygiene practices affect sleepiness to some extent in our adolescent population.

6. Sleep hygiene practices play an important role in determining sleep quality in our adolescent population. Improving sleep hygiene practices is an important first step towards better sleep quality in them.

7. Electronic media close to bedtime and not following a stable sleep schedule affects sleep quality among adolescents.

8. Bed/ bed room sharing and not following a bedtime routine did not affect sleep quality in our adolescents, both of which are specific to our culture.

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BIBLIOGRAPHY:

1. Shaikh WA, Patel M, Singh S. Association of Sleep Duration with Arterial Blood Pressure Profile of Gujarati Indian Adolescents. Indian J Community Med Off Publ Indian Assoc Prev Soc Med. 2010 Jan;35(1):125–9.

2. Knutson KL, Van Cauter E. Associations between sleep loss and increased risk of obesity and diabetes. Ann N Y Acad Sci. 2008;1129:287–304.

3. Beebe DW, Rose D, Amin R. Attention, learning, and arousal of experimentally sleep-restricted adolescents in a simulated classroom. J Adolesc Health Off Publ Soc Adolesc Med. 2010 Nov;47(5):523–5.

4. BMC Public Health | Full text | "Sleepiness" is serious in adolescence: Two surveys of 3235 Canadian students [Internet]. [cited 2015 Sep 11]. Available from: http://www.biomedcentral.com/1471-2458/6/116

5. Milewski MD, Skaggs DL, Bishop GA, Pace JL, Ibrahim DA, Wren TAL, et al. Chronic lack of sleep is associated with increased sports injuries in adolescent athletes. J Pediatr Orthop. 2014 Mar;34(2):129–33.

6. Novati A, Hulshof HJ, Koolhaas JM, Lucassen PJ, Meerlo P. Chronic sleep restriction causes a decrease in hippocampal volume in adolescent rats, which is not explained by changes in glucocorticoid levels or neurogenesis. Neuroscience. 2011 Sep 8;190:145–55.

7. Beebe DW, Simon S, Summer S, Hemmer S, Strotman D, Dolan LM. Dietary Intake Following Experimentally Restricted Sleep in Adolescents. Sleep. 2013 Jun 1;36(6):827–34.

8. Effect of chronic sleep restriction on sleepiness and working memory in adolescents and young adults. - PubMed - NCBI [Internet]. [cited 2015 Sep 18]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21950514

9. Fallone G, Acebo C, Arnedt JT, Seifer R, Carskadon MA. Effects of acute sleep restriction on behavior, sustained attention, and response inhibition in children. Percept Mot Skills. 2001 Aug 1;93(1):213–29.

10. Excessive Sleepiness in Adolescents and Young Adults: Causes, Consequences, and Treatment Strategies [Internet]. [cited 2015 Sep 18]. Available from: http://pediatrics.aappublications.org/content/115/6/1774.long

11. Kim J, Hakim F, Kheirandish-Gozal L, Gozal D. Inflammatory Pathways in Children with Insufficient or Disordered Sleep. Respir Physiol Neurobiol. 2011 Sep 30;178(3):465–74.

12. Lee YJ, Cho S-J, Cho IH, Kim SJ. Insufficient Sleep and Suicidality in Adolescents. Sleep. 2012 Apr 1;35(4):455–60.

13. Owens J, Adolescent Sleep Working Group, Committee on Adolescence. Insufficient sleep in adolescents and young adults: an update on causes and consequences. Pediatrics. 2014 Sep;134(3):e921–32.

14. Metabolic and Glycemic Sequelae of Sleep Disturbances in Children and Adults - Springer [Internet]. [cited 2015 Sep 18]. Available from: http://link.springer.com/article/10.1007%2Fs11892-014-0562-5

15. Bartel KA, Gradisar M, Williamson P. Protective and risk factors for adolescent sleep: a meta-analytic review. Sleep Med Rev. 2015 Jun;21:72–85.

16. Leproult R, Van Cauter E. Role of Sleep and Sleep Loss in Hormonal Release and Metabolism. Endocr Dev. 2010;17:11–21.

17. Roberts RE, Roberts CR, Duong HT. SLEEPLESS IN ADOLESCENCE: PROSPECTIVE DATA ON SLEEP DEPRIVATION, HEALTH AND FUNCTIONING. J Adolesc. 2009 Oct;32(5):1045–57.

18. Sleep restriction worsens mood and emotion regulation in adolescents [Internet]. [cited 2015 Sep 18]. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4047523/

19. Staff CP. Teens' sleep deprivation could affect brain development [Internet]. Contemporary Pediatrics eConsult. 2011 [cited 2015 Sep 18]. Available from: http://contemporarypediatrics.modernmedicine.com/contemporary-pediatrics/news/clinical/pediatrics/teens%E2%80%99-sleep-deprivation-could-affect-brain-develop

20. Typical sleep time in children by age group [Internet]. [cited 2015 Sep 13]. Available from: http://www.uptodate.com/contents/image?imageKey=PEDS%2F82604&topic

Key=SLEEP%2F6354&rank=1%7E55&source=see_link&search=physiology+of+sleep+in+children&utdPopup=true

21. Kleigman, Stanton. Nelson Textbook of Pediatrics. 19th ed. Saunders Elsevier;

22. Schupp M, Hanning CD. Physiology of sleep. BJA CEPD Rev. 2003 Jun 1;3(3):69–74.

23. Sleep: A Historical Perspective | Healthy Sleep [Internet]. [cited 2015 Sep 12]. Available from: http://healthysleep.med.harvard.edu/interactive/timeline

24. Magazine T de CBN. Thatcher: Can people get by on four hours' sleep? [Internet]. BBC News. [cited 2015 Oct 7]. Available from: http://www.bbc.com/news/magazine-22084671

25. Sleep, Performance, and Public Safety | Healthy Sleep [Internet]. [cited 2015 Oct 7]. Available from: http://healthysleep.med.harvard.edu/healthy/matters/consequences/sleep-performance-and-public-safety

26. Sleep physiology in children [Internet]. [cited 2015 Sep 13]. Available from: http://www.uptodate.com/contents/sleep-physiology-in-children?source=search_result&search=physiology+of+sleep+in+children&selectedTitle=1%7E55

27. Carskadon MA. Sleep in Adolescents: The Perfect Storm. Pediatr Clin North Am. 2011 Jun;58(3):637–47.

28. Group ASW, Committee on Adolescence AC on SH. School Start Times for Adolescents. Pediatrics. 2014 Aug 25;peds.2014–1697.

29. Adolescent sleep deprivation - editorial [Internet]. [cited 2015 Aug 30]. Available from: http://www.indianpediatrics.net/mar2008/181.pdf

30. BMC Public Health | Full text | "Sleepiness" is serious in adolescence: Two surveys of 3235 Canadian students [Internet]. [cited 2015 Sep 11]. Available from: http://www.biomedcentral.com/1471-2458/6/116

31. Olds T, Maher C, Blunden S, Matricciani L. Normative Data on the Sleep Habits of Australian Children and Adolescents. Sleep. 2010 Oct 1;33(10):1381–8.

32. Gradisar M, Gardner G, Dohnt H. Recent worldwide sleep patterns and problems during adolescence: a review and meta-analysis of age, region, and sleep. Sleep Med. 2011 Feb;12(2):110–8.

33. Talbot LS, McGlinchey EL, Kaplan KA, Dahl RE, Harvey AG. Sleep Deprivation in Adolescents and Adults: Changes in Affect. Emot Wash DC. 2010 Dec;10(6):831–41.

34. Short MA, Louca M. Sleep deprivation leads to mood deficits in healthy adolescents. Sleep Med. 2015 Aug;16(8):987–93.

35. Javaheri S, Storfer-Isser A, Rosen CL, Redline S. Sleep Quality and Elevated Blood Pressure in Adolescents. Circulation. 2008 Sep 2;118(10):1034–40.

36. Sleep insufficiency: Definition, consequences, and management [Internet]. [cited 2015 Sep 13]. Available from: http://www.uptodate.com/contents/sleep-insufficiency-definition-consequences-and-management?source=related_link

37. Gupta R, Bhatia MS, Chhabra V, Sharma S, Dahiya D, Semalti K, et al. Sleep patterns of urban school-going adolescents. Indian Pediatr. 2008 Mar;45(3):183–9.

38. Loessl B, Valerius G, Kopasz M, Hornyak M, Riemann D, Voderholzer U. Are adolescents chronically sleep-deprived? An investigation of sleep habits of adolescents in the Southwest of Germany. Child Care Health Dev. 2008 Sep;34(5):549–56.

39. Owens J. Insufficient Sleep in Adolescents and Young Adults: An Update on Causes and Consequences. Pediatrics. 2014 Aug 25;peds.2014–1696.

40. Eaton DK, McKnight-Eily LR, Lowry R, Perry GS, Presley-Cantrell L, Croft JB. Prevalence of insufficient, borderline, and optimal hours of sleep among high school students - United States, 2007. J Adolesc Health Off Publ Soc Adolesc Med. 2010 Apr;46(4):399–401.

41. Roberts RE, Roberts CR, Xing Y. Restricted sleep among adolescents: prevalence, incidence, persistence, and associated factors. Behav Sleep Med. 2011;9(1):18–30.

42. Teixeira LR, Fischer FM, Lowden A. Sleep deprivation of working adolescents--a hidden work hazard. Scand J Work Environ Health. 2006 Aug;32(4):328–30.

43. Chen T, Wu Z, Shen Z, Zhang J, Shen X, Li S. Sleep duration in Chinese adolescents: biological, environmental, and behavioral predictors. Sleep Med. 2014 Nov;15(11):1345–53.

44. Maduabuchi JC, Obu HA, Chukwu BF, Aronu AE, Manyike PC, Chinawa AT. Sleep pattern and practice among adolescents school children in Nigerian secondary schools. Pan Afr Med J [Internet]. 2014 Nov 21 [cited 2015 Sep 25];19. Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4394006/

45. Rhie S, Lee S, Chae KY. Sleep patterns and school performance of Korean adolescents assessed using a Korean version of the pediatric daytime sleepiness scale. Korean J Pediatr. 2011 Jan;54(1):29–35.

46. John B. Sleep-patterns, sleep hygiene behaviors and parental monitoring among Bahrain-based Indian adolescents. J Fam Med Prim Care. 2015;4(2):232–7.

47. Short MA, Gradisar M, Lack LC, Wright HR, Dohnt H. The sleep patterns and well-being of Australian adolescents. J Adolesc. 2013 Feb;36(1):103–10.

48. LeBourgeois 2005.pdf [Internet]. [cited 2015 Aug 30]. Available from: http://sleep.colorado.edu/sites/default/files/LeBourgeois%202005.pdf

49. CDC - How Much Sleep Do I Need? - Sleep and Sleep Disorders [Internet]. [cited 2015 Aug 30]. Available from: http://www.cdc.gov/sleep/about_sleep/how_much_sleep.htm

50. Chen T-Y, Chou Y-C, Tzeng N-S, Chang H-A, Kuo S-C, Pan P-Y, et al. Effects of a selective educational system on fatigue, sleep problems, daytime sleepiness, and depression among senior high school adolescents in Taiwan. Neuropsychiatr Dis Treat. 2015 Mar 19;11:741–50.

51. Gradisar M, Gardner G, Dohnt H. Recent worldwide sleep patterns and problems during adolescence: a review and meta-analysis of age, region, and sleep. Sleep Med. 2011 Feb;12(2):110–8.

52. LeBourgeois MK, Giannotti F, Cortesi F, Wolfson AR, Harsh J. The Relationship Between Reported Sleep Quality and Sleep Hygiene in Italian and American Adolescents. Pediatrics. 2005 Jan 1;115(Supplement 1):257–65.

53. Short M, Gradisar M, Lack L, Wright H, Dewald J, Wolfson A, et al. A CROSS-CULTURAL COMPARISON OF SLEEP DURATION BETWEEN U.S. AND AUSTRALIAN ADOLESCENTS: THE EFFECT OF SCHOOL START TIME, PARENT-SET BEDTIMES, AND EXTRA-CURRICULAR LOAD. Health Educ Behav Off Publ Soc Public Health Educ. 2013 Jun;40(3):323–30.

54. Sleep Health | Healthy People 2020 [Internet]. [cited 2015 Sep 16]. Available from: http://www.healthypeople.gov/2020/topics-objectives/topic/sleep-health/objectives

55. Stages and architecture of normal sleep [Internet]. [cited 2015 Sep 13]. Available from: http://www.uptodate.com/contents/stages-and-architecture-of-normal-sleep?source=see_link

56. Koo DL, Kim J. The Physiology of Normal Sleep. Hanyang Med Rev. 2013;33(4):190.

57. Sleep disorders in children and adolescents: A practical guide. In Rey JM (ed), IACAPAP e-Textbook of Child and Adolescent Mental Health. [Internet]. [cited 2015 Sep 12]. Available from: http://iacapap.org/wp-content/uploads/I-4-SLEEP-2014.pdf

58. Stages of Human Sleep - Sleep eBook [Internet]. [cited 2015 Oct 7]. Available from: http://sleepdisorders.sleepfoundation.org/chapter-1-normal-sleep/stages-of-human-sleep/

59. Patterns of Sleep and Sleepiness in Adolescents [Internet]. [cited 2015 Aug 30]. Available from: http://www.sleepforscience.org/stuff/contentmgr/files/94a9f6f63ae18bc30f3d2d0b005e42fa/pdf/carskadon_pediatrician1990.pdf

60. How Much Sleep Do We Really Need? [Internet]. [cited 2015 Sep 16]. Available from: https://sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need

61. Sleep Quality versus Sleep Quantity: Realtionships between Sleep and Measures of Health, Well being nad sleepiness in college students [Internet]. [cited 2015 Sep 16]. Available from: http://www.researchgate.net/profile/June_Pilcher/publication/13992227_Sleep_quality_versus_sleep_quantity_relationships_between_sleep_and_measures_of_health_well-being_and_sleepiness_in_college_students/links/554eb39608ae12808b365264.pdf

62. Smith MT, Wegener ST. Measures of sleep: The Insomnia Severity Index, Medical Outcomes Study (MOS) Sleep Scale, Pittsburgh Sleep Diary (PSD), and Pittsburgh Sleep Quality Index (PSQI). Arthritis Care Res. 2003 Oct 15;49(S5):S184–96.

63. Sinclair RR. Research Methods in Occupational Health Psychology: Measurement, Design, and Data Analysis. Routledge; 2012. 466 p.

64. Dewald-Kaufmann JF, Oort FJ, Meijer AM. The effects of sleep extension on sleep and cognitive performance in adolescents with chronic sleep reduction: An experimental study. Sleep Med. 2013 Jun;14(6):510–7.

65. Sleep loss, learning capacity and academic performance [Internet]. [cited 2015 Sep 18]. Available from: http://www.kvccdocs.com/KVCC/2015-Spring/PSY101/Lessons/L-04/sleep-loss.pdf

66. Dewald JF, Meijer AM, Oort FJ, Kerkhof GA, Bögels SM. The influence of sleep quality, sleep duration and sleepiness on school performance in children and adolescents: A meta-analytic review. Sleep Med Rev. 2010 Jun 1;14(3):179–89.

67. The sleepy adolescent: causes and consequences of sleepiness in teens [Internet]. [cited 2015 Sep 25]. Available from: http://www.sciencedirect.com/science/article/pii/S1526054208000031

68. Ng EP, Ng DK, Chan CH. Sleep duration, wake/sleep symptoms, and academic performance in Hong Kong Secondary School Children. Sleep Breath Schlaf Atm. 2009 Nov;13(4):357–67.

69. Javaheri S, Storfer-Isser A, Rosen CL, Redline S. Sleep Quality and Elevated Blood Pressure in Adolescents. Circulation. 2008 Sep 2;118(10):1034–40.

70. Pizza F, Contardi S, Antognini AB, Zagoraiou M, Borrotti M, Mostacci B, et al. Sleep Quality and Motor Vehicle Crashes in Adolescents. J Clin Sleep Med JCSM Off Publ Am Acad Sleep Med. 2010 Feb 15;6(1):41–5.

71. van Schalkwijk FJ, Blessinga AN, Willemen AM, Van Der Werf YD, Schuengel C. Social support moderates the effects of stress on sleep in adolescents. J Sleep Res. 2015 Aug;24(4):407–13.

72. Sun W-Q, Spruyt K, Chen W-J, Jiang Y-R, Schonfeld D, Adams R, et al. The relation among sleep duration, homework burden, and sleep hygiene in chinese school-aged children. Behav Sleep Med. 2014 Sep 3;12(5):398–411.

73. Dewald JF, Meijer AM, Oort FJ, Kerkhof GA, Bögels SM. Adolescents' Sleep in Low-Stress and High-Stress (Exam) Times: A Prospective Quasi-Experiment. Behav Sleep Med. 2014 Nov 2;12(6):493–506.

74. Onyper SV, Thacher PV, Gilbert JW, Gradess SG. Class start times, sleep, and academic performance in college: a path analysis. Chronobiol Int. 2012 Apr;29(3):318–35.

75. Let Them Sleep: AAP Recommends Delaying Start Times of Middle and High Schools to Combat Teen Sleep Deprivation [Internet]. [cited 2015 Sep 16]. Available from: https://www.aap.org/en-us/about-the-aap/aap-press-room/pages/let-them-sleep-aap-recommends-delaying-start-times-of-middle-and-high-schools-to-combat-teen-sleep-deprivation.aspx

76. Lemola S, Perkinson-Gloor N, Brand S, Dewald-Kaufmann JF, Grob A. Adolescents' electronic media use at night, sleep disturbance, and depressive symptoms in the smartphone age. J Youth Adolesc. 2015 Feb;44(2):405–18.

77. Arora T, Broglia E, Thomas GN, Taheri S. Associations between specific technologies and adolescent sleep quantity, sleep quality, and parasomnias. Sleep Med. 2014 Feb;15(2):240–7.

78. Irish LA, Kline CE, Gunn HE, Buysse DJ, Hall MH. The role of sleep hygiene in promoting public health: A review of empirical evidence. Sleep Med Rev. 2015 Aug;22:23–36.

79. Storfer-Isser A, LeBourgeois M, Harsh J, Tompsett C, Redline S. Psychometric Properties of the Adolescent Sleep Hygiene Scale (ASHS). J Sleep Res [Internet]. 2013 Dec [cited 2015 Oct 2];22(6). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3752307/

80. Gellis LA, Park A, Stotsky MT, Taylor DJ. Associations between sleep hygiene and insomnia severity in college students: cross-sectional and prospective analyses. Behav Ther. 2014 Nov;45(6):806–16.

81. Gradisar M, Gardner G, Dohnt H. Recent worldwide sleep patterns and problems during adolescence: a review and meta-analysis of age, region, and sleep. Sleep Med. 2011 Feb;12(2):110–8.

82. LeBOURGEOIS MK, GIANNOTTI F, CORTESI F, WOLFSON A, HARSH J. Sleep Hygiene and Sleep Quality in Italian and American Adolescents. Ann N Y Acad Sci. 2004 Jun;1021:352–4.

83. Lewandowski AS, Toliver-Sokol M, Palermo TM. Evidence-Based Review of Subjective Pediatric Sleep Measures. J Pediatr Psychol. 2011 Aug;36(7):780–93.

84. Sadeh A. Iii. Sleep Assessment Methods. Monogr Soc Res Child Dev. 2015 Mar 1;80(1):33–48.

85. de Bruin EJ, van Kampen RKA, van Kooten T, Meijer AM. Psychometric properties and clinical relevance of the Adolescent Sleep Hygiene Scale in Dutch adolescents. Sleep Med. 2014 Jul 1;15(7):789–97.

86. American Thoracic Society - Epworth Sleepiness Scale , revised for children [Internet]. [cited 2015 Sep 12]. Available from: http://www.thoracic.org/members/assemblies/assemblies/srn/web-education-site/questionaires/essrfc.php

87. The Epworth Sleepiness Scale What the Epworth Sleepiness Scale is and how to use it – Dr Murray Johns [Internet]. [cited 2015 Sep 11]. Available from: http://epworthsleepinessscale.com/about-epworth-sleepiness/

88. Matricciani L, Blunden S, Rigney G, Williams MT, Olds TS. Children's Sleep Needs: Is There Sufficient Evidence to Recommend Optimal Sleep for Children? Sleep. 2013 Apr 1;36(4):527–34.

89. Arora T, Broglia E, Pushpakumar D, Lodhi T, Taheri S. An Investigation into the Strength of the Association and Agreement Levels between Subjective and Objective Sleep Duration in Adolescents. PLoS ONE. 2013 Aug 9;8(8):e72406.

90. Nunes ML, Bruni O. Insomnia in childhood and adolescence: clinical aspects, diagnosis, and therapeutic approach. J Pediatr (Rio J) [Internet]. [cited 2015 Oct 3]; Available from: http://www.sciencedirect.com/science/article/pii/S0021755715001308

91. Storfer-Isser A, LeBourgeois M, Harsh J, Tompsett C, Redline S. Psychometric Properties of the Adolescent Sleep Hygiene Scale (ASHS). J Sleep Res [Internet]. 2013 Dec [cited 2015 Sep 28];22(6). Available from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3752307/

92. Owens JA. Sleep in children: Cross-cultural perspectives. Sleep Biol Rhythms. 2004 Oct;2(3):165–73.

93. Millman RP. Excessive Sleepiness in Adolescents and Young Adults: Causes, Consequences, and Treatment Strategies. Pediatrics. 2005 Jun 1;115(6):1774–86.

94. Essner B, Noel M, Myrvik M, Palermo T. Examination of the Factor Structure of the Adolescent Sleep–Wake Scale (ASWS). Behav Sleep Med. 2015 Jul 4;13(4):296–307.

ANNEXURES:

1. Institutional Review Board Approval letter

2. District Education Officer permission letter

3.Consent form English

4. Consent form Tamil

5. Questionnaire English

6. Questionnaire Tamil

7. Adolescent Sleep Hygiene Scale (ASHS) Domains - questions

8. Adolescent Sleep Wake Scake (ASWS) Subscales – questions

9. Excel data sheet

OFFICE OF RESEARCH
INSTITUTIONAL REVIEW BOARD (IRB)
CHRISTIAN MEDICAL COLLEGE, VELLORE, INDIA.

Dr. B.J. Prashantham, M.A., M.A., Dr. Min (Clinical)
Director, Christian Counseling Center,
Chairperson, Ethics Committee.

Dr. Alfred Job Daniel, D Ortho, MS Ortho, DNB Ortho
Chairperson, Research Committee & Principal

Dr. Nihal Thomas,
MD., MNAMS., DNB (Endo), FRACP (Endo), FRCP (Edin), FRCP (Glasg)
Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

November 17, 2014

Dr. Sataroopa Mishra
PG Registrar
Department of Child Health
Christian Medical College, Vellore 632 004

Sub: **Fluid Research Grant Project:**
Sleep among Indian Teens (SIT): A Cross sectional Study of the Sleep Patterns and Sleep Hygiene, Sleepiness levels, Of Indian Adolescents.
Dr. Sataroopa Mishra, PG Registrar, Dr. Mona Basker, Dr. Sneha Varkki, Child Health Unit 3, CMC, Vellore.

Ref: IRB Min No: 9133 dated 12.11.2014

Dear Dr. Sataroopa Mishra,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project titled "Sleep among Indian Teens (SIT): A Cross sectional Study of the Sleep Patterns and Sleep Hygiene, Sleepiness levels, Of Indian Adolescents. " on November 12th 2014. I am quoting below the minutes of the meeting.

The Committee raised the following queries:

a) Selection Bias will be there since you are choosing largely government schools- please document this.
b) Sleep pattern vary in a week; weekend and before class examinations, do you account for these?
c) There are 69 questions. Would it be possible to finish this in 45 minute?
d) Have the Tamil translation of the questionnaire been validated?
e) Bias with regard to students discussing the questionnaire – How would you take care of this bias.
f) Many children may not know the parents income--- this will have to be taken into account.
g) A consent form for the parents will be required.
h) A parent information sheet is required with the phone numbers of the investigators.
i) The student information sheet should be part of the consent form.
j) Do a stratified
k) Elaborate on the travel expenditure- please keep all invoices.
l) No data entry charges are allowed (biostatiscians fees). Remove that.
m) Leave out "caste" from the questionnaire.

Ethics Committee Blue, Office of Research, 1st Floor, Carman Block, Christian Medical College, Vellore, Tamil Nadu 632 002.
Tel : 0416 - 2284294, 2284202 Fax : 0416 - 2262788, 2284481 E-mail : research@cmcvellore.ac.in

Dr. B.J. Prashantham, M.A., M.A., Dr. Min (Clinical)
Director, Christian Counseling Center,
Chairperson, Ethics Committee.

Dr. Alfred Job Daniel, D Ortho, MS Ortho, DNB Ortho
Chairperson, Research Committee & Principal

Dr. Nihal Thomas,
MD., MNAMS., DNB (Endo), FRACP (Endo), FRCP (Edin), FRCP (Glasg)
Deputy Chairperson
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

j) Include the time taken to travel in the questionnaire.

Dr. Sataroopa Mishra P and Dr. Mona Basker,were present during the presentation of the proposal and satisfactorily responded to the queries raised by the Members. After discussion, it was resolved to **ACCEPT the proposal AFTER receiving the suggested modifications and answers to the queries.**

Note:
1. Kindly **HIGHLIGHT** the modifications in the revised proposal.
2. Keep a **covering letter and point out the answer to the queries**.
3. Reply to the queries should be submitted within **3 months** duration from the time of the thesis/ protocol presentation, if not the thesis/protocol have to be resubmitted to the IRB.
4. The **checklist** has to be sent along with the responses.

Email the details to research@cmcvellore.ac.in and send a hard copy through internal dispatch to Dr. Nihal Thomas, Addl. Vice-Principal (Research), Principal's Office, CMC.

Yours sincerely,

Dr. Nihal Thomas
Secretary (Ethics Committee)
Institutional Review Board

Dr. NIHAL THOMAS
MD.,MNAMS.,DNB(Endo),FRACP(Endo),FRCP(Edin),FRCP(Glasg)
SECRETARY - (ETHICS COMMITTEE)
Institutional Review Board,
Christian Medical College, Vellore - 632 002.

Cc: Dr. Mona Basker, Child Health, CMC, Vellore.

Ethics Committee Blue, Office of Research, 1st Floor, Carman Block, Christian Medical College, Vellore, Tamil Nadu 632 002.
Tel : 0416 - 2284294, 2284202 Fax : 0416 - 2262788, 2284481 E-mail : research@cmcvellore.ac.in

Proceedings of the Chief Educational Officer, Vellore District
Rc.No.659/B3/2014 dated 18.11.2014

Sub : Education - Vellore District – "Sleep among Indian Teens (SIT) : A Cross Sectional Study of the Sleep Patterns and Sleep Hygiene, Sleepiness levels of Indian Adolescents" – Dr. Sataroopa Mishra, M.D. students in Department of Child Health from CMC, Vellore – permitted to have the study in schools – reg.

Ref : Letter from Dr.Sataroopa Mishra (P.G.Student) and others dated 18.11.2014

Dr.Sataroopa Mishra, M.D.Student, in Department of Child Health from CMC, Vellore, has requested us to conduct an observational study in "Sleep among Indian Teens (SIT): A Cross Sectional Study of the Sleep Patterns and Sleep Hygiene, Sleepiness levels of Indian Adolescents", among students of standard 9th and 11th in schools as part of her dissertation.

This is to inform you to have her study in below mentioned schools and the Headmasters are informed to permit her to conduct the study without disturbing the usual procedures of school.

for Chief Educational Officer,
Vellore.

To
The Headmaster
1. Govt. Hr. Sec. School, Poottuthakku
2. Govt. Muslim Hr. Sec. School, Vellore
3. Govt. Hr. Sec. School, Thorapadi, Vellore
4. E.V.R.N. Govt. Girls Hr. Sec. School, Vellore
5. Govt. (Mpl). Girls Hr. Sec. School, Thottapalayam, Vellore

Copy to
Dr.Sataroopa Mishra (P.G.Student)
Department of Child Health
Christian Medical College, Vellore.

Sleep Among Indian Teens (SIT) - Study Of Sleep Patterns, Sleep Hygiene and Sleepiness levels Of Indian Adolescents.

Department of Paediatrics, Christian Medical College, Vellore

I. PARENTAL INFORMATION SHEET

Dear Parents,

We the doctors working in the Department of Paediatrics, Christian Medical College, Vellore are interested in Adolescent health, which means health of children in the age group of 10 -19 years. We would like to look at the sleep habits and sleep quality of adolescents. For this we plan to include all the students studying in 9^{th} and 11^{th} grades in this survey.

You as parents would agree with us that good quality sleep is essential for good for physical and mental health. Proper sleep will enhance your child's efficiency to perform well in studies, sports and other extracurricular activities. Research has revealed that poor sleep leads to obesity and heart problems. During teenage years, several changes happen both within the body and the outside environment. Adolescents need to take on new social responsibilities. Due to these factors, their sleep habits are affected. As doctors treating young people for various medical problems, it is important for us know if our teenagers are healthy with regard to their sleep.

Your child will be given a set of questions with regard to their sleep. We will introduce the topic to the children before they actually start answering the questions. They will be given an option of not participating if they do not want to do so. One of us will be present throughout the period it takes for them to complete the questionnaire. So they will be able clarify their doubts regarding the questionnaire. Completing the questionnaire will take 45 minutes. As a part of the study, we will also measure their height and weight

Answering these questions will cause no risk to your ward. The students will not put their names on the survey, so their privacy is protected. After completion of this survey, a report of findings will be made which will not contain any students' name or school's name. The results of this survey will help us physicians to

identify sleep problems of our teenagers and improve the teenagers sleep health and lifestyle. As mentioned earlier, taking part in this study is voluntary.

We have obtained permission from the school authorities; we now request your permission to include your ward in this study.

Kindly sign the attached form and send it back with the student to be handed over to the school authorities within 2 days.

Thank you,

Dr. Sataroopa Mishra
Post Graduate Registrar
Dept of Paediatrics
CMC, Vellore 0416-2213344

Dr. Mona Basker
Professor
Dept. of Paediatrics
CMC, Vellore 9489592002

Dr Sneha Varkki
Professor
Dept. of Pediatrics
CMC, Vellore

II. PARENTAL INFORMED CONSENT

Student's name: _____

Grade and Section: _____

I confirm that I have read and understood the information sheet for the above study

( ) YES, my child may take part in this survey.
( ) NO, my child may no take part in this survey.

Parent's signature: _____

Date: _____

III. We request you to provide the below mentioned information as a part of the study: (Please encircle the appropriate option)

1)Father's level of education
i. Primary school
ii. Secondary school
iii. Graduate
iv. Post-graduate

2) Mother's level of education
i. Primary school
ii. Secondary school
iii. Graduate
iv. Post-graduate

3) Father's occupation
i.Daily wage labourer
ii. Salaried worker
iii.Professional
iv.Businessman
v.Others – specify

4) Mother's occupation
i. Daily wage labourer
ii. Salaried worker
iii. Professional
iv. Businessman
v. Others – specify.

5) Income of both parents per month (approximate income in rupees):
_____

6) No. of rooms in your house other than kitchen: _____

7) How much time does it take to travel to school from home in morning? :

_____

குழந்தை நலப்பிரிவு, கிருத்துவ மருத்துவ கல்லூரி, வேலூர்.

இந்திய வாலிபரின் தூக்க வழக்கம் (SIT)

I பெற்றோர் தகவல் படிவம்

அன்பார்ந்த பெற்றோரே,

வேலூர் சி.எம்.சி. மருத்துவமனை குழந்தைநல பிரிவிலுள்ள மருத்துவராகிய நாங்கள், 10-19 வயதுள்ள வாலிப பருவத்தினரின் ஆரோக்கியத்தில் ஆர்வம் கொண்டுள்ளோம். வாலிப பருவத்தினரின் தூக்க வழக்கம், தூக்க தரம் குறித்து ஆராய்ச்சி செய்ய விரும்புகிறோம். இந்த ஆய்வுக்கு 9, 11 வகுப்பு மாணவர்கள் அனைவரையும் சேர்க்க போகிறோம்.

பெற்றோர் ஆகிய நீங்கள் உயர்தர தூக்கம், உடல் ஆரோக்கியத்திற்கும் மனநலத்திற்கும் மிகவும் அவசியம் என்பதை ஒப்புக்கொள்வீர்கள். நல்ல தூக்கம் உங்கள் குழந்தையின் படிப்பு, விளையாட்டு, மற்றும் படிப்பு சாரா செயல்களில் நன்றாக செய்யமுடியும். தூக்கமின்மை உடல் பருமன் மற்றும் இருதய நோய்க்கு காரணமாக இருக்கும் என்று ஆராய்ச்சி மூலம் நாம் அறிகிறோம். இளம்பருவத்தில், உடலின் உள்ளேயும் புற சூழ்நிலையிலும் பல மாற்றங்கள் உண்டாகும். வாலிப சமூக சம்பந்தமான பொறுப்புகளை ஏற்க வேண்டியிருக்கும். ஆகையால் அவர்தம் தூக்கம் பாதிக்கப்படுகிறது. வாலிபருடைய பல்வேறு மருத்துவ பிரச்னைகளுக்கு சிகிச்சை அளிக்கும் மருத்துவராகிய எங்களுக்கு அவரது தூக்க சம்பந்தப்பட்ட உடல் நலம் குறித்து அறிந்திருப்பது மிகவும் அவசியம்.

உங்கள் மகன்/மகளின் தூக்கத்தை குறித்து ஒரு கேள்விப்படிவம் அவர்களுக்கு தரப்படும். அவர்கள் பதிலளிக்கும் முன்பு இவ்வாராய்ச்சியை குறித்து அவர்களிடம் பேசுவோம். இதில் பங்கேற்க அவர்களுக்கு ஆர்வம் இல்லையென்றால் பரவாயில்லை. பங்கேற்பவர் வினாத்தாளை பதிலளித்து முடிக்கும் வரை எங்களில் ஒருவர் வகுப்பறையில் இருப்போம். சந்தேகங்களை நிவர்த்தி செய்வோம். படிவத்தை பூர்த்தி செய்ய 45 நிமிடங்கள் ஆகும். அவர்களது உயரம் எடை அளக்கப்படும்.

இக்கருத்தாய்வில் பங்கு கொள்வதால் உங்கள் பிள்ளைக்கு எந்த பாதிப்பும் ஏற்படாது. மாணவர்கள் தங்கள் பெயரை எழுதவேண்டியதில்லை. எனவே உங்கள் பிள்ளையின் தனித்துவம் பாதுகாக்கப்படும். ஆய்வின் முடிவில் மாணவர்களுடைய பெயரோ அல்லது பள்ளியின் பெயரோ குறிப்பிடபடமாட்டாது. இந்த ஆராய்ச்சியின்

முடிவு, மருத்துவராகிய எங்களுக்கு வாலிபரின் தூக்கம் சம்பந்தப்பட்ட உடல் நலத்தை அறியமுடியும். முன்பே கூறியது போல இந்த ஆராய்ச்சியில் பங்கேற்பது தன்னிச்சையானது.

நாங்கள் இந்த ஆராய்ச்சியை மேற்கொள்ள பள்ளி அதிகாரிகளிடம் அனுமதி பெற்றுள்ளோம். உங்களுடைய பிள்ளை இதில் பங்கு கொள்ள உங்களுடைய அனுமதியை இப்போது நாங்கள் வேண்டுகிறோம்.

உங்களுக்கு ஆட்சேபணை இல்லையென்றால் தயவு செய்து கீழ்கண்டுள்ள படிவத்தில் கையெழுத்திட்டு 2 நாளில் பள்ளி அதிகாரியிடம் சமர்ப்பிக்குமாறு கேட்டுக்கொள்கிறோம்.

மிக்க நன்றி,

டாக்டர். சத்தருப்பா மிட்ரா
முதுகலை மாணவர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.

டாக்டர். மோனா பாஸ்கர்
பேராசிரியர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.
கைபேசி - 9489592002

டாக்டர். ஸ்நேஹா வர்க்கி
பேராசிரியர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.

II **<u>பெற்றோர் அனுமதி படிவம்</u>**

மாணவர் பெயர் - வகுப்பு

நான் இந்த படிவத்தை படித்து புரிந்து கொண்டேன்.

( ) ஆம், என் பிள்ளை இந்த ஆய்வில் கலந்து கொள்ள சம்மதிக்கிறேன்

( ) இல்லை, என் பிள்ளை இந்த ஆய்வில் கலந்து கொள்ளவதில் சம்மதமில்லை

பெற்றோர் கையொப்பம் - தேதி -

III. ஆய்வின் ஒரு பகுதியாக கீழே தரப்பட்டுள்ள தகவலை பூர்த்தி செய்து தருமாறு கேட்டுக்கொள்கிறோம். (சரியானவற்றை √ குறியிடவும்)

. 1. தந்தையின் கல்வி தகுதி என்ன?

அ) தொடக்க கல்வி
ஆ) இடைநிலை கல்வி
இ) பட்டதாரி
ஈ) முதுகலை பட்டதாரி

2. தாயின் கல்வித் தகுதி என்ன?

அ) தொடக்க கல்வி
ஆ) இடைநிலை கல்வி
இ) பட்டதாரி
ஈ) முதுகலை பட்டதாரி

3. தந்தை என்ன வேலை செய்கிறார்?

அ) தினக்கூலி
ஆ) மாத ஊதியம்
இ) வாழ்க்கை தொழிலர் (professional – eg.Doctor, Engineer, Lawyer,Nurse etc.) ;;;
ஈ) வணிகர் (businessman**)**
உ) மற்றவை - Kurippidu

4. தாய் என்ன வேலை செய்கிறார்?

அ) தினக்கூலி
ஆ) மாத ஊதியம்
இ) வாழ்க்கை தொழிலர் (professional – eg.Doctor, Engineer, Lawyer, Nurse etc.)
ஈ) வணிகர் (businessman**)**
உ) இல்லத்தரசி
ஊ) மற்றவை

5. பெற்றோரின் மாத குடும்ப வருமானம். (ரூ _____)

6. உன் வீட்டில் சமையல் அறையைத் தவிர எத்தனை அறைகள் உள்ளன?

7. காலையில் உன் வீட்டிலிருந்து பள்ளிக்கு செல்ல எவ்வளவு நேரம் தேவைப்படுகிறது?

Department of Paediatrics, Christian Medical College, Vellore

Sleep Among Indian Teens (SIT)

INFORMATION FOR STUDENTS

Dear student,

Thank you for taking part in this important survey we are conducting among teenagers.

We are doctors working in Department of Child Health, Christian Medical College Vellore. We presume you all must have had some problems, small or large regarding your sleep timings and sleep habits. There may be times when you don't want to go to bed at night or may be sleep for some more time in morning but you are forced to get up. Reasons can be many like school timings, coaching classes, family rules and so on. One or the other time, your parents would have scolded you for not getting up on time. You would have experienced yourselves that the day you have proper sleep, you feel energetic, fresh and perform better in studies as well as other activities. So you all know how important a good quality sleep is.

We as doctors are conducting a survey to know about your sleep habits. This will help us understand better your sleep problems and help you to develop healthy sleep habits. Young people in several other countries have answered similar questions that you are going to answer today. The answers you give will be kept private i.e., only 3-4 people who are conducting the survey will have access to the papers that you hold in your hands. Try to answer each of these questions based on what you actually do.

Completing the survey is voluntary. If you are not comfortable answering a question, feel free to leave it blank. But, if you are able to, please try and answer all questions. As you are going to encircle each option, there will be no way of identifying you with your handwriting.

If you would like our assistance in any way please contact us at Paediatrics Unit 3, Christian Medical College, Vellore.

Dr. Sataroopa Mishra
Post Graduate Registrar
Dept of Paediatrics
CMC, Vellore 0416-2213344

Dr. Mona Basker
Professor
Dept. of Paediatrics
CMC, Vellore 9489592002

Dr Sneha Varkki
Professor
Dept. of Pediatrics
CMC, Vellore

STUDENT ASSENT FORM

My mother and/or father or caregiver knows about this study and they want me to be in this study if I want to. Participation in this study is voluntary. If I do not want to be part of study no one will be upset with me. I know that my study doctor has informed my parents about the study and they have understood the implications of taking part in this study and explained it to me.

I have read and understood the information sheet for the above study and I agree to take part in the above study.

Student's name: _____

Grade: _____

Student's signature: _____

Date: _____

DIRECTIONS

Use a black or blue pen. At anytime during these 45 minutes, you can change an answer by crossing out and marking another answer.

Example:

1. What is your age – completed number of years?
   A. 12 years old or younger
   B. 13 years old
   C. 14 years old
   D. 15 years old
   E. 16 years old
   F. 17 years old
   G. 18 years old or older

Encircle the number which you think is the correct answer.

YOU CAN NOW START !

I PERSONAL INFORMATION

1) Name:_____

2) What is **your age**, (in completed years)? :_____

3) What is your **gender**?
   i. Female ii. Male

4) In what **grade and section** are you? _____

5) Name of the **school** you are studying in? _____

6) Do you have any long term illness(like diabetes, asthma) or take long term medications (more than a month) YES / NO

II FAMILY DETAILS

7) What is your religion?
i. Hinduism
ii. Islam
iii.Christianity
iv.Jainism
v.Buddhism
vi.Others – specify

III*Questions 1- 61 Directions: Using the choices below, circle how often the following things have happened <u>during the past one month</u>

Never – Has not happened – 0% (N)

Once in Awhile – happened 20% of the time (O)

Sometimes –happened 40% of the time (S)

Quite often – happened 60% of time (Q)

Frequently, if not always – happened 80% of the time (F)

Always happened 100% of the time (A)

		0%	20%	40%	60%	80%	100%
During the day…							
1.	…I take a nap that lasts **more than** 1 hour	N	O	S	Q	F	A
After 6 in the evening…							
2.	…I have drinks with caffeine (for example: cola, tea, coffee)	N	O	S	Q	F	A
3.	…I smoke or chew tobacco	N	O	S	Q	F	A
4.	…I drink beer (or some other drinks with alcohol)	N	O	S	Q	F	A
During the 1 hour before bedtime…							
5	…things happen that make me feel **strong emotions** (sadness, anger, excitement)	N	O	S	Q	F	A
6	…I am **very active** (for example: playing outside, running, wrestling)	N	O	S	Q	F	A
7	…I do things that make me feel **very awake** (for example: playing video games, watching TV, talking on telephone)	N	O	S	Q	F	A
8	…I drink more than 4 glasses of water (or some other liquid)	N	O	S	Q	F	A
I go to bed…		0%	20%	40%	60%	80%	100%
9	…and do things in my bed that keep me awake (for example: watching TV, reading)	N	O	S	Q	F	A
10.	…and think about things I need to do.	N	O	S	Q	F	A
11.	…feeling upset.	N	O	S	Q	F	A
12.	…replay the day's event over and over in my mind.	N	O	S	Q	F	A
13.	…and worry about things happening at home or at school	N	O	S	Q	F	A
14.	…with a stomach ache	N	O	S	Q	F	A

Never – Has not happened (0%) (N)

Once in Awhile – happened 20% of the time (O)

Sometimes –happened 40% of the time (S)

Quite often – happened 60% of time (Q)

Frequently, if not always – happened 80% of the time (F)

Always happened 100% of the time (A)

15.	…feeling hungry	N	O	S	Q	F	A
I fall asleep…							
16.	…while listening to loud music.	N	O	S	Q	F	A
17.	…while watching TV.	N	O	S	Q	F	A
18.	…in a **brightly** lit room (for example : the overhead light is on)	N	O	S	Q	F	A
19.	…in a room that feels too hot or cold.	N	O	S	Q	F	A
20.	…use a bedtime routine (for example: bathing, brushing teeth, reading)	N	O	S	Q	F	A
21.	…use my bed for things **other than sleep** (for example: Talking on the telephone, watching TV, playing video games, d homework)	N	O	S	Q	F	A
22.	…check my clock several times during the night.	N	O	S	Q	F	A
23.	I sleep alone	N	O	S	Q	F	A
24.	I sleep all or part of the night with someone else	N	O	S	Q	F	A
During the school week (Monday to Friday), I…							
25.	…stay up **more than 1** hour past my **usual** bedtime (FILL IN THE BLANK BELOW) My usual **school night** bedtime is -------: ---------- am: pm	N	O	S	Q	F	A
26.	…"sleep in" **more than 1** hour past my **usual** wake time (FILL IN THE BLANK BELOW) My usual **school day** wake time is -------:--------- am :pm	N	O	S	Q	F	A

Never – Has not happened (0%) (N)

Once in Awhile – happened 20% of the time (O)

Sometimes –happened 40% of the time (S)

Quite often – happened 60% of time (Q)

Frequently, if not always – happened 80% of the time (F)

Always happened 100% of the time (A)

	On weekend (Saturday and Sunday), I...						
27.	…stay up **more than 1 hour** past my **usual** bedtime. (FILL IN THE BLANK BELOW) My usual **weekend** bedtime is ------:------- am: pm	N	O	S	Q	F	A
28.	…"sleep in" **more than1 hour** past my usual wake time. (FILL IN THE BLANK BELOW) My usual **weekend** wake time is ------:-------am: pm	N	O	S	Q	F	A
Questions **29- 34** are ***Only*** about ***Going to Bedtime*** at bedtime		0%	20%	40%	60%	80%	100%
When its time to go to bed…							
29.	…I want to stay up and do other things (for example: watch TV, play video games or talk on the phone)	N	O	S	Q	F	A
In general…							
30.	…I have trouble making myself go to bed at bedtime.	N	O	S	Q	F	A
31.	…I am ready to go to bed at bed time.	N	O	S	Q	F	A
32.	…I enjoy bedtime.	N	O	S	Q	F	A
33.	…I try to "put off" or delay going to bed.	N	O	S	Q	F	A
34.	How long do you **usually** "put off" or delay going to bed? a) Less than 30 minutes b) 30 to 60 minutes c) more than 60 minutes						

Never – Has not happened – 0% (N)

Once in Awhile – happened 20% of the time (O)

Sometimes –happened 40% of the time (S)

Quite often – happened 60% of time (Q)

Frequently, if not always – happened 80% of the time (F)

Always happened 100% of the time (A)

Question **35-41** are ***only*** about you ***Falling Asleep*** after "lights –out"							
When its time to go to sleep (lights –out)…							
35.	…I have trouble settling down.	N	O	S	Q	F	A
36.	…I feel sleepy.	N	O	S	Q	F	A
37.	…I lie down, but then get up and come out of the bedroom.	N	O	S	Q	F	A
In general…							
38.	…I have trouble going to sleep	N	O	S	Q	F	A
39.	…I need help getting to sleep (for example: I need to listen to music, watch TV, take medication or have someone else in the bed with me.)	N	O	S	Q	F	A
40.	…I fall asleep quickly.	N	O	S	Q	F	A
41.	How long does it **usually** take you to fall asleep after lights-out? a) less than 15 minutes b) 15 – 30 minutes c) more than 30 minutes						
Questions **42 – 48** are ***only*** about how you ***Sleep*** during the night (someone else could have told you these things)							
During the night…							
42.	…I toss and turn in my bed.	N	O	S	Q	F	A
43.	…I am very restless.	N	O	S	Q	F	A
44.	…I moan, groan or talk in my sleep	N	O	S	Q	F	A
45.	…my legs kick or jerk.	N	O	S	Q	F	A
46.	… I wake up more than once.	N	O	S	Q	F	A
In general…							
47.	…I sleep soundly through the night.	N	O	S	Q	F	A

	Never – Has not happened – 0% (N) Once in Awhile – happened 20% of the time (O) Sometimes –happened 40% of the time (S) Quite often – happened 60% of time (Q) Frequently, if not always – happened 80% of the time (F) Always happened 100% of the time (A)						
48.	How often do you **usually** wake during the night? a) Never b)1-2 times c) more than 3 times						
Questions **49-55** are ***only*** about you ***Going back to sleep*** after waking during night							
After waking up during night…							
49.	…I have trouble going back to sleep.	N	O	S	Q	F	A
50.	…I have trouble getting comfortable.	N	O	S	Q	F	A
51.	…I wake up another family member.	N	O	S	Q	F	A
52.	…I need help to go back to sleep. (for example : I need to watch TV, read or sleep with another person)	N	O	S	Q	F	A
53.	…I feel scared.	N	O	S	Q	F	A
54.	… I roll over and go right back to sleep.	N	O	S	Q	F	A
55.	How long does it take **usually** take you to go back to sleep after waking up during the night? a) Less than 15 minutes b) 15 -30 minutes c) More than 30 minutes						
Questions 56 -61 are ***only*** about you ***Waking*** in the morning?							
In the morning ,I wake up…							
56.	…and feel ready to get up for the day	N	O	S	Q	F	A
57.	…feeling rested and alert.	N	O	S	Q	F	A
58.	… and just can't get going.	N	O	S	Q	F	A
In general…							
59.	…I **need help** waking up in the morning. (for example: from an alarm clock or another person)	N	O	S	Q	F	A
60.	…I have trouble getting out of the bed in the morning.	N	O	S	Q	F	A

61.	How long does it take you to feel **comfortably awake** in the morning? (circle one) a) Less than 5 minutes b) 5 to 15 minutes c) 15 -30 minutes d) More than 30 minutes

** 62. How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your usual way of life in recent times. Even if you have not done some of these things recently, think about how they would have affected you. Use the following scale to choose the most appropriate number for each situation.

0=would never doze or sleep

1=slight chance of dozing or sleeping

2=moderate chance of dozing or sleeping

3=high chance of dozing or sleeping.

Circle the most appropriate number for each situation:

(1) Sitting and reading 0 1 2 3

(2) Watching television 0 1 2 3

(3) Sitting inactive in a public place (for example, a movie theater or classroom)

0 1 2 3

(4) As a passenger in a car for an hour without a break

0 1 2 3

(5) Lying down to rest in the afternoon when circumstances permit

0 1 2 3

(6) Sitting and talking to someone 0 1 2 3

(7). Sitting quietly after lunch 0 1 2 3

(8). Doing homework or taking a test 0 1 2 3

***Questions1-28 Adolescent Sleep Hygiene Scale (ASHS), Questions 29-61 Adolescent Sleep Wake Scale (ASWS) - Pediatrics. 2005 January ; 115(1 0): 257–265. The Relationship Between Reported Sleep Quality and Sleep Hygiene in Italian and American Adolescents LeBourgeois M. K., Giannotti F., Cortesi F., Wolfson A., Harsh J.**

****Epworth Sleepiness Scale—Children http://www.thoracic.org/assemblies/srn/questionaires/essrfc.php**

Please write below any comments or suggestions you may have about this survey:

_____
_____
_____
_____
_____
_____
_____

Thank you very much for participating in this survey

Dr. Sataroopa Mishra
Dr.Mona Basker
Dr. Sneha Titus

குழந்தை நலப்பிரிவு, கிருத்துவ மருத்துவ கல்லூரி, வேலூர்

இந்திய வாலிபரின் தூக்க வழக்கம் (SIT)

மாணவர் தகவல் படிவம்

அன்பார்ந்த மாணவ/மாணவியரே.

வாலிபரிடையே நாங்கள் நடத்தும் இந்த முக்கிய ஆராய்ச்சியில் பங்கு பெற்றமைக்கு நன்றி.

நாங்கள் சி.எம்.சி மருத்தவமனை குழந்தை நலப்பிரிவில் பணி புரியும் மருத்துவர். தூக்க நேரத்தை குறித்தோ, தூக்க சம்பந்தமான பழக்க வழக்கங்களை குறித்தோ உங்களுக்கு சில பிரச்னைகள் இருக்கலாம் என்று நாங்கள் யோசிக்கிறோம். சில சமயம் உங்களுக்கு இரவில் தூங்க செல்வதற்கு பிடிக்காமல் இருக்கலாம். அல்லது காலையில் வெகு நேரம் தூங்குவதற்கு விருப்பப்பட்டாலும் வலுக்கட்டாயமாக எழும்ப வேண்டிய நிலை ஏற்பட்டிருக்கலாம். இதற்கு பள்ளி நேரம், கோச்சிங் வகுப்புகள், குடும்ப விதிமுறைகள் என பல காரணங்கள் இருக்கக்கூடும். பெற்றோர் உங்களை சமயத்தில் எழும்பாததால் திட்டியும் இருக்கலாம். நன்றாக தூங்கியதால், மறுநாள் சுறுசுறுப்போடும் புத்துணர்ச்சியோடும் படிப்பிலும் மற்ற காரியத்திலும் செயல்படமுடியும் என்பது தான் உண்மை. நன்றாக தூங்குவதின் முக்கியத்துவத்தை நாங்கள் அனைவரும் அறிந்திருப்பீர்கள்.

மருத்துவராகிய நாங்கள் உங்களுடைய தூக்கவழக்கங்களை பற்றி அறிந்து கொள்ள ஒரு ஆராய்ச்சி செய்ய இருக்கிறோம். தூக்க சம்பந்தப்பட்ட பிரச்சினைகளை புரிந்து கொள்ளவும் நல்ல தூக்க வழக்கத்தை வாலிபரிடத்தில் ஊக்குவிக்கவும் இந்த ஆராய்ச்சி எங்களுக்கு மிகவும் உதவியாக இருக்கும். உங்களைப் போலவே வெளிநாட்டு வாலிபர் பலரும் நீங்கள் விடையளிக்க போகும் இவ்வினாக்களுக்கு பதிலளித்து உள்ளனர்.

<u>உங்கள் பெயரை வினாத்தாளில் குறிப்பிடவேண்டாம்.</u> நீங்கள் அளிக்கப்போகும் பதில்களை இரகசியமாக வைத்திருப்போம்; இந்த ஆராய்ச்சியில் ஈடுபட்டுள்ள **3-4** நபர் மட்டுமே உங்களுடைய பதில்தாளை பார்க்க முடியும்.

உங்களுக்கு எங்கள் உதவி தேவைப்பட்டால் தொடர்புகொள்ள வேண்டிய முகவரி :

டாக்டர். சத்தருப்பா மிஸ்ரா
முதுகலை மாணவர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.

டாக்டர். மோனா பாஸ்கர்
பேராசிரியர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.
கைபேசி - **9489592002**

டாக்டர். ஸ்நேஹா வர்க்கி
பேராசிரியர்
குழந்தைநலப்பிரிவு-3,
கிருத்துவ மருத்துவமனை,
வேலூர்.
0416-2283343/2286162.

மாணவர் ஒப்புதல் படிவம்

இந்த ஆய்வைப் பற்றிய விவரங்கள் என்னுடைய தாய் மற்றும்/அல்லது தந்தை அல்லது பாதுகாவலர் ஆகியவர்களுக்கு தெரியும். நான் இதில் பங்கு கொள்ள விருப்பப்பட்டால் அவர்களுக்கு ஆட்சேபணை எதுவுமில்லை. இந்த ஆய்வில் பங்கேற்பது தன்னிச்சையானது. இதில் நான் பங்கேற்கவில்லை என்றால் எவரும் என் மீது வருத்தம் கொள்ள மாட்டார்கள். இந்த ஆராய்ச்சியை மேற்கொள்ளும் மருத்துவர் இந்த ஆய்வை பற்றிய விவரங்களை என்னுடைய பெற்றோர்களிடம் விளக்கியுள்ளனர். என் பெற்றோர்களும் இந்த ஆய்வில் பங்கு கொள்வதன் முக்கியத்துவத்தைப் பற்றி புரிந்து கொண்டு என்னிடமும் விளக்கியுள்ளனர்.

மேற்கூறிய ஆய்வு தகவல் தாளை நான் படித்து புரிந்து கொண்டேன். இதில் பங்கு கொள்ள நான் சம்மதிக்கிறேன்.

மாணவரின் பெயர்: _____

வகுப்பு: _____

மாணவரின் கையொப்பம்: _____

தேதி: _____

குழந்தை நலப்பிரிவு, கிருத்துவ மருத்துவ கல்லூரி, வேலூர்

இந்திய வாலிபரின் தூக்க வழக்கம் (SIT)

செயல்முறை:

விடையளிக்க நீலம் மற்றும் கருப்பு மை பேனாவை உபயோகிக்கவும். நீங்கள் விடைகளை திருத்த விரும்பினால் இந்த 40 நிமிட நேரத்திற்குள் செய்துகொள்ளலாம். ஏற்கனவே அளித்த விடையை அடித்துவிட்டு வேறு விடையின் மேல் குறியீடு செய்யலாம்.

எடுத்துக்காட்டு:

1. **உங்கள் வயதென்ன? (முழுமையான வருடங்கள்)**

   அ) 12 வயது
   ஆ) 13 வயது
   இ) 14 வயது
   ஈ) 15 வயது
   உ)16 வயது
   ஊ)17 வயது
   எ)18 வயது மற்றும் அதற்குமேல்

நீங்கள் சரியென்று நினைக்கும் விடையின் மேல் O இடுக:

I சுய விவரங்கள்(personal details):

1. **உன் பெயரென்ன?**

2. **உன் வயதென்ன?**

3. **உன் பாலினம் என்ன?**
   அ) பெண்
   ஆ) ஆண்

4. **நீ என்ன வகுப்பு மற்றும் பிரிவில் படிக்கிறாய்?**

5. **உன் பள்ளியின் பெயரென்ன?**

6. **உங்களுக்கு நீண்ட நாள் வியாதி ஏதாவது (சர்க்கரை வியாதி/ஆஸ்துமா) அல்லது வெகு நாட்களாக மருந்து எடுத்துக் கொண்டிருக்கிறீர்களா (ஒரு மாதத்திற்கு மேல்)?**

   ஆம் / இல்லை.

II குடும்ப விவரம்

7. **உன் மதம் என்ன?**

   அ) இந்து ஆ) முகமதியர் இ) கிறித்துவர் ஈ) புத்தமதம் உ) மற்றவை

III கீழ்கண்ட அட்டவணையிலுள்ள கேள்விகளுக்கு பதிலளிக்கும் முறை:

கீழ்கண்ட வி C யங்கள், <u>கடந்த ஒரு மாதத்தில்</u் எத்தனை முறை நிகழ்ந்தது என்பதை தெரிவிக்க வட்டம்/சரிக் குறியிடவும். **எப்போதுமில்லை: எப்போதும் நடந்ததில்லை (எஇ)** **எப்போதாவது: 20% நேரம் நடைபெற்றது (எ)** **சிலநேரம்: 40% நேரம் நடைபெற்றது (சி)** **அடிக்கடி: 60% நேரம் நடைபெற்றது (அ)** **பெரும்பாலும்: 80% நேரம் நடைபெற்றது (பெ)** **எல்லாக் காலங்களிலும்: 100% நேரம் நடைபெற்றது (எகா)**							
பகல் நேரத்தில் நான்.....							
1.	**... >1 மணி நேரம் குட்டித்தூக்கம் போடுவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
மாலை 6 மணிக்குப் பிறகு நான்							
2.	**... கேஃபீன் (caffeine) நிறைந்த பானங்கள் குடிப்பேன் (எ.கா.: காபி, டீ, கோக், பெப்ஸி).**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
3.	**...புகையிலை பிடிப்பேன்/மெல்லுவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
4.	**... பீர் குடிப்பேன் (அல்லது வேறு சில மது பானங்கள்).**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
தூங்குவதற்கு 1 மணி நேரத்திற்கு முன் நான்.....							
5.	**... தீவிர உணர்ச்சிவசப்பட வைக்கும் (சோகம், கோபம், பரபரப்பு) சில சம்பவங்கள் நடக்கும்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
6.	**...மிகவும் சுறுசுறுப்பாக இருப்பேன் (எ.கா: வெளியில் விளையாடுதல், ஓடுதல், குஸ்தி போடுதல்)**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
7.	**...மிகவும் விழிப்புணர்வு உண்டாக்கும் சில செயல்களை செய்வேன் (எ.கா: வீடியோ கேம்ஸ், தொலைகாட்சி, புத்தகம் வாசிப்பது, தொலைபேசியில் பேசுவது, வீட்டுப்பாடம் (homework) செய்வது).**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
8.	**...4 தம்ளர் தண்ணீர் குடிப்பேன் (அல்லது வேறு பானங்கள்).**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
நான் படுத்த பிறகு...							
9.	**... என்னை விழித்திருக்க வைக்கும் சில வி C யங்களை செய்கிறேன் (எ.கா: வீடியோ கேம்ஸ், தொலைகாட்சி, புத்தகம் வாசிப்பது, தொலைபேசியில் பேசுவது, வீட்டுப்பாடம் (homework) செய்வது).**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
10.	**...நான் செய்யவேண்டிய காரியங்களைப் பற்றி யோசிப்பேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
11.	**...மன சஞ்சலப்படுவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
12.	**...பகலில் நடந்த நிகழ்ச்சியை திரும்ப திரும்ப யோசிப்பேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
13.	**...வீட்டில்/பள்ளியில் நடக்கும் நிகழச்சிகளை நினைத்து கவலைப்படுவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
14.	**...வயிறு வலியோடு இருப்பேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
15.	**...பசியோடு இருப்பேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
நான் தூங்கும்போது.....							
16.	**...மிகவும் சத்தமான இசை கேட்டுகொண்டே தூங்குவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**
17.	**...டி.வி. பார்த்துக்கொண்டே தூங்குவேன்.**	**எஇ**	**எ**	**சி**	**அ**	**பெ**	**எகா**

கீழ்கண்ட வி C யங்கள், <u>தடந்த ஒரு மாதத்தில்</u> எத்தனை முறை நிகழ்ந்தது என்பதை தெரிவிக்க வட்டம்/சரிக் குறியிடவும்.

எப்போதுமில்லை: எப்போதும் நடந்ததில்லை (எஇ)

எப்போதாவது: 20% நேரம் நடைபெற்றது (எ)

சிலநேரம்: 40% நேரம் நடைபெற்றது (சி)

அடிக்கடி: 60% நேரம் நடைபெற்றது (அ)

பெரும்பாலும்: 80% நேரம் நடைபெற்றது (பெ)

எல்லாக் காலங்களிலும்: 100% நேரம் நடைபெற்றது (எகா)

18.	...அதிக வெளிச்சமுள்ள அறையில் தூங்குவேன் (எ.கா.: மின்விளக்கு எரியும்போது).	எஇ	எ	சி	அ	பெ	எகா
19.	...மிகவும் சூடாக/குளிராக இருக்கும் ஒரு அறையில் தூங்குவேன்.	எஇ	எ	சி	அ	பெ	எகா
20.	நான் தினமும் தூங்குவதற்கு முன் ஒரேவிதமான நடைமுறையை கடைபிடிப்பேன். (எ.கா.குளித்தல், பல்தேய்த்தல், புத்தகம் வாசித்தல்)	எஇ	எ	சி	அ	பெ	எகா
21.	என் படுக்கையில் தூங்குவதை தவிர வேறு சில காரியங்கள் செய்வேன் (எ.கா: வீடியோ கேம்ஸ், தொலைகாட்சி, புத்தகம் வாசிப்பது, தொலைபேசியில் பேசுவது, வீட்டுப்பாடம் (homework) செய்வது).	எஇ	எ	சி	அ	பெ	எகா
22.	இரவில் பல முறை நான் கடிகாரத்தை பார்ப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
23.	நான் தனியாக தூங்குவேன்	எஇ	எ	சி	அ	பெ	எகா
24.	நான் இரவு முழுவதும் / இரவின் சில மணிநேரங்கள் மட்டும் யாருடனாவது தூங்குவேன்	எஇ	எ	சி	அ	பெ	எகா
வார நாட்களில் (திங்கள் முதல் வெள்ளி/சனிக்கிழமை).....							
25.	...வழக்கமான தூக்க நேரத்திலிருந்து ஒரு மணி நேரத்திற்கு மேல் தாமதமாக தூங்க செல்வேன். கீழ்கண்ட இடத்தை நிரப்பவும் ...நான் வழக்கமாக தூங்கும் நேரம் : __:__ am/pm	எஇ	எ	சி	அ	பெ	எகா
26.	...வழக்கமாக காலையில் விழிக்கும் நேரத்தை விட ஒரு மணி நேரம் தாமதமாக விழிப்பேன். கீழ்கண்ட இடத்தை நிரப்பவும் ...நான் வழக்கமாக விழிக்கும் நேரம் : __:__ am/pm	எஇ	எ	சி	அ	பெ	எகா
வார/முடிவு நாட்களில் (சனிக்கிழமை-ஞாயிறு).....On weekends (Saturday-Sunday).....							
27.	...வழக்கமான தூக்க நேரத்திலிருந்து ஒரு மணி நேரத்திற்கு மேல் தாமதமாக தூங்க செல்வேன். கீழ்கண்ட இடத்தை நிரப்பவும் ...நான் வழக்கமாக தூங்கும் நேரம் : __:__ am/pm	எஇ	எ	சி	அ	பெ	எகா
28.	...வழக்கமாக காலையில் விழிக்கும் நேரத்தை விட ஒரு மணி நேரம் தாமதமாக விழிப்பேன். கீழ்கண்ட இடத்தை நிரப்பவும் ...நான் வழக்கமாக விழிக்கும் நேரம் : __:__ am/pm... ...	எஇ	எ	சி	அ	பெ	எகா

கீழ்கண்ட விடயங்கள், <u>கடந்த ஒரு மாதத்தில்</u> எத்தனை முறை நிகழ்ந்தது என்பதை தெரிவிக்க வட்டம்/சரிக் குறியிடவும்.

எப்போதுமில்லை: எப்போதும் நடந்ததில்லை (எஇ)

எப்போதாவது: 20% நேரம் நடைபெற்றது (எ)

சிலநேரம்: 40% நேரம் நடைபெற்றது (சி)

அடிக்கடி: 60% நேரம் நடைபெற்றது (அ)

பெரும்பாலும்: 80% நேரம் நடைபெற்றது (பெ)

எல்லாக் காலங்களிலும்: 100% நேரம் நடைபெற்றது (எகா)

கேள்விகள் 29-34 இரவில் நீங்கள் தூங்கப்போவதை பற்றியதாகும்							
தூங்க போகும் சமயத்தில்.....							
29.	...விழித்திருந்து மற்ற காரியங்களை செய்ய விரும்புவேன் (எ.கா: வீடியோ கேம்ஸ், தொலைகாட்சி, புத்தகம் வாசிப்பது, தொலைபேசியில் பேசுவது, வீட்டுப்பாடம் (homework) செய்வது).	எஇ	எ	சி	அ	பெ	எகா
பொதுவாக.....							
30.	...தூங்கவேண்டிய நேரத்தில் தூங்குவதற்கு எனக்கு மிகவும் கடினமாக உள்ளது.	எஇ	எ	சி	அ	பெ	எகா
31.	...சரியான நேரத்தில் தூங்குவதற்கு நான் தயாராக இருக்கிறேன்.	எஇ	எ	சி	அ	பெ	எகா
32.	...தூங்கும் நேரத்தை சந்தோசமாக கழிப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
33.	...நான் தூக்கத்தை தவிர்க்க அல்லது தள்ளி போட முயற்சிப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
34.	வழக்கமாக நீ எவ்வளவு நேரம் தூக்கத்தை தவிர்க்க அல்லது தள்ளி போடுவாய்? (அ) <30 நிமிடங்கள் (ஆ) 30-60 நிமிடங்கள் (இ) > 60 நிமிடங்கள்.						
35-41 கேள்விகள் விளக்கு அணைத்த பிறகு தூங்குவதற்கு எவ்வளவு நேரம் ஆகும் என்பதை பற்றி மட்டும்.							
தூங்க போகும் சமயத்தில் (விளக்கை அணைத்தபின்).....							
35.	...அமைதியாவதற்கு எனக்கு கடினமாக உள்ளது.	எஇ	எ	சி	அ	பெ	எகா
36.	...தூக்கம் சொக்குகிறது.	எஇ	எ	சி	அ	பெ	எகா
37.	...நான் படுத்த பிறகு, மறுபடியும் எழுந்து படுக்கையை விட்டு வெளியே போகிறேன்.	எஇ	எ	சி	அ	பெ	எகா
பொதுவாக							
38.	...நான் தூங்க போவதற்கு கடினப்படுவேன்.	எஇ	எ	சி	அ	பெ	எகா
39.	...நான் தூங்குவதற்கு உதவி தேவைப்படுகிறது (எ.கா.பாட்டு கேட்பது, டி.வி பார்ப்பது, தூக்க மருந்து, அல்லது மற்றவருடன் தூங்குவது).	எஇ	எ	சி	அ	பெ	எகா
40.	...நான் படுத்தவுடன் சீக்கிரம் தூங்கிவிடுவேன்.	எஇ	எ	சி	அ	பெ	எகா
41.	...விளக்கணைத்த பிறகு நீ தூங்குவதற்கு எவ்வளவு நேரமாகும்? (அ) <15 நிமிடங்கள் (ஆ)15-30 நிமிடங்கள் (இ) >30 நிமிடங்கள்.						
கேள்விகள் 42-48, நீ இரவில் எவ்வாறு தூங்குவாய் என்பதை பற்றியது (உன்னுடைய தூக்கத்தை குறித்து வேறு யாராவது உனக்கு சொல்லி இருக்கக்கூடும்).							
இரவில் நான் தூங்கும்போது.....							
42.	...புரண்டு புரண்டு படுப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
43.	...அசைந்து கொண்டே இருப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
44.	...முனகுவேன்/உளறுவேன்/புலம்புவேன்.	எஇ	எ	சி	அ	பெ	எகா

கீழ்கண்ட விடயங்கள், <u>கடந்த ஒரு மாதத்தில்</u> எத்தனை முறை நிகழ்ந்தது என்பதை தெரிவிக்க வட்டம்/சரிக் குறியிடவும்.

எப்போதுமில்லை: எப்போதும் நடந்ததில்லை (எஇ)

எப்போதாவது: 20% நேரம் நடைபெற்றது (எ)

சிலநேரம்: 40% நேரம் நடைபெற்றது (சி)

அடிக்கடி: 60% நேரம் நடைபெற்றது (அ)

பெரும்பாலும்: 80% நேரம் நடைபெற்றது (பெ)

எல்லாக் காலங்களிலும்: 100% நேரம் நடைபெற்றது (எகா)

இரவில் நான் தூங்கும்போது.....							
45.	...கால்களை உதைப்பேன்/உதறுவேன்.	எஇ	எ	சி	அ	பெ	எகா
46.	....பல முறை விழித்துக் கொள்வேன்.	எஇ	எ	சி	அ	பெ	எகா
பொதுவாக.....							
47.	...இரவில் நான் ஆழ்ந்து தூங்குவேன்.	எஇ	எ	சி	அ	பெ	எகா
48.	...இரவில் எத்தனை முறை விழித்து கொள்வாய்? (அ) ஒருபோதுமில்லை (ஆ) 1 - 2 முறை (இ) >3.						
49-55 கேள்விகள் இரவில் விழித்த பிறகு, திரும்ப தூங்குவதைப் பற்றியவை							
இரவில் தூக்கத்திலிருந்து விழித்த பிறகு.....							
49.	...மறுபடியும் தூங்குவதற்குக் கடப்படுவேன்.	எஇ	எ	சி	அ	பெ	எகா
50.	...சகஜ நிலைக்கு வர கடப்படுவேன்.	எஇ	எ	சி	அ	பெ	எகா
51.	...குடும்பத்தில் உள்ள வேறொருவரை எழுப்புவேன்.	எஇ	எ	சி	அ	பெ	எகா
52.	...திரும்ப தூங்குவதற்கு எனக்கு உதவி தேவைப்படுகிறது (எ.கா.பாட்டு கேட்பது, டி.வி பார்ப்பது, தூக்க மருந்து, மற்றவருடன் தூங்குவது).	எஇ	எ	சி	அ	பெ	எகா
53.	...பயப்படுவேன்.	எஇ	எ	சி	அ	பெ	எகா
54.	...உடனடியாக திரும்பவும் தூங்கிவிடுவேன்.	எஇ	எ	சி	அ	பெ	எகா
55.	இரவில் விழித்த பிறகு மறுபடியும் தூங்குவதற்கு எவ்வளவு நேரம் ஆகும்? (அ) <15 நிமிடங்கள் (ஆ)15-30 நிமிடங்கள் (இ) >30 நிமிடங்கள்.						
கேள்விகள் 56-61, நீ காலையில் எழுவதை பற்றியது.							
காலையில் நான் விழித்தவுடன்.....							
56.	....எழுந்து வேலை செய்ய தயார் என்று உணர்வேன்.	எஇ	எ	சி	அ	பெ	எகா
57.	....இளைப்பாறி மற்றும் விழிப்புடன் இருப்பேன்.	எஇ	எ	சி	அ	பெ	எகா
58.	....எந்த காரியத்தையும் ஆரம்பிக்கமுடியவில்லை.	எஇ	எ	சி	அ	பெ	எகா
பொதுவாக.....							
59.	....காலையில் எழும்புவதற்கு எனக்கு உதவி தேவை (எ.கா.: அலாரம்/வேறு ஒரு நபரின் உதவி).	எஇ	எ	சி	அ	பெ	எகா
60.	....காலையில் படுக்கையை விட்டு எழும்ப நான் கடப்படுவேன்.	எஇ	எ	சி	அ	பெ	எகா
61.	காலையில் நன்றாக விழிப்பதற்கு எவ்வளவு நேரம் உனக்கு தேவைப்படுமென நினைக்கிறாய்? (அ) <5 நிமிடங்கள் (ஆ) 5-15 நிமிடங்கள் (இ) 15-30 நிமிடங்கள் (ஈ) >30 நிமிடங்கள்.						

62-69 **கேள்விகளுக்கு விடையளிக்கும் விதிமுறை:**

கீழ்கண்ட சூழ்நிலையில் வெறும் அசதி (tired) **மாத்திரம் இல்லாமல் தூங்கிவிடுவது எவ்வளவு சகஜம்? இது சமீபகாலத்து வழக்கமாக உனக்கு இருக்கும், சமீபத்தில் இதுபோன்ற காரியங்கள் நடக்கவில்லை என்றாலும், அப்படி நடந்தால் உன்னை எப்படி அது பாதிக்கும் என்று யோசித்து விடையளி.**

கீழ்கண்ட அளவுகோலை உபயோகித்து ஒவ்வொரு சூழ்நிலைக்கு தகுந்த விடையை தேர்ந்தெடு.

0= **எப்பொழுதுமே கிறங்கி/தூங்கி இருக்கமாட்டேன்.**
1= **கிறங்கி/தூங்குவது உண்டு.**
2= **கிறங்கி/தூங்க கொஞ்சம் அதிகமான வாய்ப்புண்டு.**
3 =**கிறங்கி/தூங்குவதில் மிகவும் அதிகமான வாய்ப்புண்டு.**

0, 1, 2, 3இல் தகுந்த எண்ணை குறியிடவும்					
62.	**உட்கார்ந்து புத்தகம் வாசிக்கும்போது.**	**0**	**1**	**2**	**3**
63.	**டி.வி. பார்க்கும்போது.**	**0**	**1**	**2**	**3**
64.	**பொது இடத்தில் அமைதியாக உட்கார்ந்து கொண்டிருக்கும்போது (எ.கா. சினிமா தியேட்டர்/வகுப்பறையில்).**	**0**	**1**	**2**	**3**
65.	**ஒரு காரில் ஒருமணி நேரம் தொடர்ச்சியாக பயணம் செய்யும்போது.**	**0**	**1**	**2**	**3**
66.	**மதிய வேளையில் ஓய்வாக படுத்திருக்கும் போது.**	**0**	**1**	**2**	**3**
67.	**யாரிடமாவது உட்கார்ந்து பேசிக்கொண்டு இருக்கும்போது.**	**0**	**1**	**2**	**3**
68.	**மதிய உணவு உண்டு அமைதியாக உட்கார்ந்து இருக்கும்போது.**	**0**	**1**	**2**	**3**
69.	**வீட்டுப்பாடம்/தேர்வு எழுதிக் கொண்டிருக்கும் போது.**	**0**	**1**	**2**	**3**

கீழ்கண்ட இடத்தில் இந்த ஆராய்ச்சியை பற்றி உங்கள் கருத்தை எழுதவும்:

_____

_____

_____

_____

_____

இந்த ஆராய்ச்சியில் கலந்து கொண்டதற்கு மிக்க நன்றி.

டாக்டர். சத்தருப்பா மிஸ்ரா டாக்டர். மோனா பாஸ்கர் டாக்டர்.எஸ்தேஹரா வர்க்கி

ADOLESCENT SLEEP WAKE SCALE - SUBSCALES AND ITEMS

Going to bed

When it's time to go to bed, I want to stay up and do other things (for example: watch television, play video games, talk on the phone).

I have trouble making myself go to bed at bedtime.

I am ready to go to bed at bedtime.

I enjoy bedtime.

I try to “put off” or delay going to bed.

Falling asleep

When it's time to go to sleep (lights-out), I have trouble settling down.

When it's time to go to sleep (lights-out), I feel sleepy.

When it's time to go to sleep (lights-out), I lie down but then get up and come out of the bedroom.

I have trouble going to sleep.

I need help getting to sleep (for example: I need to listen to music, watch television, take medication, or have someone else in the bed with me).

I fall asleep quickly.

Maintaining sleep

During the night, I toss and turn in my bed.

During the night, I am very restless.

During the night, I moan, groan, or talk in my sleep.

During the night, my legs kick or jerk.

During the night, I wake up more than once.

I sleep soundly through the night.

Reinitiating sleep

After waking up during the night, I have trouble going back to sleep.

After waking up during the night, I have trouble getting comfortable.

After waking up during the night, I wake up another family member.

After waking up during the night, I need help to go back to sleep (for example: I need to watch television, read, or sleep with another person).

After waking up during the night, I feel scared.

After waking up during the night, I roll over and go right back to sleep.

Returning to wakefulness

In the morning, I wake up and feel ready to get up for the day.

In the morning, I wake up feeling rested and alert.

In the morning, I wake up and just can't get going.

I need help waking up in the morning (for example: from an alarm clock or another person).

I have trouble getting out of the bed in the morning.

ADOLESCENT SLEEP HYGIENE SCALE – DOMAINS AND ITEMS

Physiological

After 6:00 pm, I have drinks with caffeine (for example: cola, pop, root beer, iced tea, coffee).

During the 1 hour before bedtime, I am very active (for example: playing outside, running, wrestling).

During the 1 hour before bedtime, I drink >4 glasses of water (or some other liquid).

I go to bed with a stomachache.

I go to bed feeling hungry.

Cognitive

During the 1 hour before bedtime, I do things that make me feel very awake (for example: playing video games, watching television, talking on the telephone).

I go to bed and do things in my bed that keep me awake (for example: watching television, reading).

I go to bed and think about things I need to do.

I go to bed and replay the day's events over and over in my mind.

I use my bed for things other than sleep (for example: talking on the telephone, watching television, playing video games, doing homework).

I check my clock several times during the night.

Emotional

During the 1 hour before bedtime, things happen that make me feel strong emotions (sadness, anger, excitement).

I go to bed feeling upset.

I go to bed and worry about things happening at home or at school.

Sleep environment

I fall asleep while listening to loud music.

I fall asleep while watching television.

I fall asleep in a brightly lit room (for example, the overhead light is on).

I fall asleep in a room that feels too hot or too cold.

Daytime sleep

During the day I take a nap that lasts > 1 hour.

Substances

After 6:00 pm, I smoke or chew tobacco.

After 6:00 pm, I drink beer (or other drinks with alcohol).

Bedtime routine

I use a bedtime routine (for example, bathing, brushing teeth, reading).

Sleep stability

During the school week, I stay up >1 hour past my usual bedtime.

During the school week, I “sleep in” >1 hour past my usual wake time.

On weekends, I stay up >1 hour past my usual bedtime.

On weekends, I “sleep in” >1 hour past my usual wake time.

Bed/bedroom sharing

I sleep alone.

I sleep all or part of the night with someone else (for example, with your parent[s], sister, or brother).

slno	age	sex	gs	school	illness	fatedu	motedu	fatocc	motocc	income	rooms	tt	religion	n1nap	n2drinks	n3smoke	n4beer	n5emotion	n6active	n7awake	n8water	n9awake	n10think	n11upset	n12replay	n13worry	n14stomac	n15hungry	n16music
1	14	1	IX D	DON BOSC	2	2	2	1	5	3000	3	0.15	3	4	5	6	6	3	1	2	1	2	1	6	4	5	6		6
2	14	1	IX D	DON BOSC	2	2	2	1	5	4000	2	0.3	2	4	5	6	6	3	1	2	1	2	1	6	4	5	6	4	6
3	14	1	IX D	DON BOSC	2	2	2	1	1	6000	3	0.3	1	4	5	6	6	3	1	2	1	2	1	5	4	5	6	4	6
4	14	1	IX D	DON BOSC	2	2	2	1	2	5000	2	0.3	1	4	5	6	6	3	1	2	1	2	1	5	4	5	6	4	6
5	14	1	IX D	DON BOSC	2	1	1		2	1000	1	1	1	6	5	6	6	5	4		5	1	4	3		2	4	3	3
6	14	1	IX D	DON BOSC	2	3	1	1	5	5000	2	1	1	6	5	6	6	4	2	4	1	1	4	5	6	6	5	4	6
7	13	1	IX B	DON BOSC	2	1	1	1	5	2000	2	0.15	1	6	4	6	6	6	3	5	4	6	5	6		4	4	6	5
8	14	1	IX B	DON BOSCO HIGH SCH	1	1	1	1		1	0.2	2																	
9	13	1	IX B	DON BOSC	2								2	5	5	6	6	1	1	1	1	5	6	6	6	6	6	6	
10	13	1	IX B	DON BOSC	2			1	1	4500	1	1	1	6	6	6	6	3	2	4	2	6	6	6		6	6	6	6
11	14	1	IX B	DON BOSC	2	1	1	1	1	5000	2	0.3	1	6	6	6	6	6	2	5	5	6	3	6	5	6	6	6	6
12	14	1	IX B	DON BOSC	2	2	2	1	2	6000	1	0.2	2	6	6	6	6	3	2	4	2	6	6	6		6	6	6	6
13	14	1	IX B	DON BOSC	2	2	2	1		3000	1	0.15	1		6	6	6	5	5			5							
14	14	1	IX B	DON BOSC	2	2	2	2	2	15000	1	0.15	3	5	5	6	6	1	1	1	1	5	6	6	6	6	6	6	
15	14	1	IX D	DON BOSC	2	2	2	1	5	3500	1	0.25	2	6	5	6	6	5	4	1	4	1	5	6	4	5	6	5	6
16	13	1	IX D	DON BOSC	2	2	2	1	5	2000	1	0.15	1	6	4	6	6	4	4	4		4	4	4	4	4	6	4	6
17	14	1	IX D	DON BOSC	2	2	2	2	5	3000	1	0.4	1	6	5	6	6	4	2	4	1	4	4	5	6	6	6	4	6
18	14	1	IX D	DON BOSC	2	2	2	1	5	2000	1	0.25	1	6	5	6	6	4	2	1	1	1	4	5	5	6	5		6
19	13	1	IX D	DON BOSC	2	1	2	1	5	6000	2	0.15	2	6	5	6	6	5	4	1	4	1	5	6	4	5	6	5	6
20	14	1	IX D	DON BOSC	2	2	1	2	6	6000	2	0.2	1	6	4	6	6	4	2	2	3	2	2	5	2	4	2	3	6
21	14	1	IX D	DON BOSC	2	2	2	1	5	5000	3	0.1	1	6	1	6	6	4	4	1	1	6	6	1	6	1	6	4	1
22	14	1	IX D	DON BOSC	2	1	1	1	5	5000	1	0.15	1	5	5	6	6	4	4	1	1	1	5	5	5	5	4	3	4
23	13	1	IX B	DON BOSC	2	2	1	5	5	2000	2	0.15	1	6	5	6	6	4	5	4	1	1	6	6	1	6	4	4	6
24	13	1	IX B	DON BOSC	2	1	2	1	5	6000	2	0.15	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
25	13	1	IX B	DON BOSC	2								1	6															
26	14	1	IX D	DON BOSC	1	2	1	1	5	4000	1	0.3	1	6	6	6	6	6	3	3	3	3	3	6	3	3	3	3	6
27	14	1	IX D	DON BOSC	1	1	1	1	2	3000	2	0.3	2	6		6	6	6	3	3	3	3	3	6	3	3	3	3	6
28	14	1	IX C	DON BOSC	2	1	1	1	5	5000	1	0.15	1	5	4	6	6	2	2	2	5	3	3	4	4	6	5	4	6
29	14	1	IX D	DON BOSC	2	2	2	1		5000	1	0.3	1	5	5	6	6	5	3	5	6	5	6	6	5	5	5	5	4
30	14	1	IX C	DON BOSC	2	1	2	1	5	3000	1	0.3	1	6	5	6	6	5	3	5	5	6	5	5	6	5	5	6	6
31	13	1	IX C	DON BOSC	2	1	2	5	6	2500	3	0.3	1	5	5	6	6	6	5	4	4	2	6	6	6	6	5	5	5
32	14	1	IX C	DON BOSC	2	2	2	1	1	3000	1	0.3	1	5	5	6	6	6	5	5	5	5	5		6	6	5	5	6
33	14	1	IX C	DON BOSC	2	2	2	1	5	6000	3	0.3	1	5	5	6	6	5		5	5	4	5	6	6	5	5	2	6
34	14	1	IX C	DON BOSC	2	2	3	1	5	4000	1	0.1	1	6	4	6	6		1	1	2	1	6	6	5	6	6	6	6
35	15	1	IX C	DON BOSC	1	1	1	1	6	4000	2	0.3	2	6	3	6	6	3	6	3	3	3	6	6	6	3	6	6	6
36	15	1	IX C	DON BOSC	2	2	2	1	5	3000	2	0.25	1	6	6	6	6		1	1	2	6	1	2	2	6	5	6	5
37	14	1	IX C	DON BOSC	2	2	2	1	1	5000	2	0.3	3	6	5	6	6	5	5	5	3	5	5	5	4	4	5	4	6
38	14	1	IX C	DON BOSC	2	2	1	1	5	5000	3	0.25	1	5	4	6	6	5	6	3	6	5	4	6	2	1	4	6	
39	14	1	IX C	DON BOSCO HIGH SCH	2	2	1	2	4000	1	0.2	1	3	3	6	6	3	6	3	3	3	6	6	6	3	6	3	6
40	13	1	IX C	DON BOSC	2	3	2	1	2	8000	1	2	1	5	5	6		3	1	1	3	1	5	6	5	5	5	4	6
41	13	1	IX C	DON BOSC	2	2	1	1	1	3000	2	0.1	3	5	5	6	6	6	5	4	5	5	6	6	5	6	5	5	6
42	14	1	IX C	DON BOSC	2	3	2	4	5	3000	2	0.45	1	6	5	6	6	5	4	1	5	6	4	6	3	5	6	5	6
43	14	1	IX C	DON BOSC	2	1	1	2	2	5000	2	0.2	2	6	4	6	6	5	2	2	2	2			5	5	6	6	6
44	14	1	IX C	DON BOSC	2	1	1	1	1	1500	2	0.2	1	5		6	6	6	5	5	5	2	6	6	6	6	5	5	5
45	14	1	IX C	DON BOSC	2	3	3	2	1	6000	2	0.2	2	6	2	6	6	6	5	2	2	6	2	2	6	6	2	2	6
46	14	1	IX C	DON BOSC	2	1	1	1	5	36000	2	0.2	2	5	2	6	6	6	5	5	5	5	5	6	5	5	5	5	5
47	15	1	IX C	DON BOSC	2	1		2	6	5000	1	0.3	2	5	2	6	6	6	5	5	5	5	5	6	5	5	5	5	5
48	14	1	IX C	DON BOSC	2	1	3	2	5	36000	2	0.2	2	5	2	6	6	6	5	5	5	5	5	6	5	5	5	5	5
49	14	1	IX C	DON BOSC	2	2	1	1	5	3000	1	0.3	1	5	5	6	6	6	5	2		2	2	5	5	5	5		6
50	15	1	IX C	DON BOSC	2	1	1	1	5	2000	2	0.15	2	5	2	6	6	6	5	5	5	5	5	6	5	5	5	5	5
51	15	1	IX C	DON BOSC	2	1	1	1	5	3000	3	0.3	1	6	5	6	6	5	2	2	2	2	5	5	5	5	5	6	6
52	15	1	IX C	DON BOSC	2	1	1	1	1	1500	1	0.15	2	6	5	6	6	3	5	5	5	6	3	3	6	5	5	4	6
53	14	1	IX C	DON BOSC	2	2	2	1	1	3000	2	0.3	1	5	3	4	6	3	6	6	5	4	4	3	3	5	3		5
54	14	1	IX C	DON BOSC	2	1	1	2	2	52000			2	5	2	6	6	6	5	5	5	5	5	6	5	5	5	5	5
55	15	1	IX D	DON BOSC	2	2	1	2	2	8000	2	0.1	3	4	1	6	6	5	4	1	2	4	1	3	4	2	5	3	2
56	13	1	IX D	DON BOSC	1	2	2	1	5	5000	2	0.3	3	4	1	6	6	4	1	1	1	1	1	3	5	5	4	3	5
57	14	1	IX D	DON BOSC	1	1	1	1	5	8000	1	0.3		6	5	6	6	4	2	4	1	1	4	5	6	6	5	4	6
58	13	1	IX D	DON BOSC	2	2	1						1	6	5	6	6	5	5	5	5	5	4	4	4		5	5	5
59	14	1	IX D	DON BOSC	2	1	1	2	5	10000	1	0.3	1	5	5	6	6	6	5	5	3	5	6	5	5	4	6	5	6
60	13	1	IX D	DON BOSC	2	2	2	2	5	3000	1	0.1	2	6	5	6	6	5	5	5	5	5	4	6	4	5	5	6	6
61	14	1	IX B	DON BOSC	2	1	2	1	5	5000	1	0.15	1	5	1	6	6	5	1	3	1	3	2		5	3	5	5	6
62	14	1	IX B	DON BOSC	2	1	2	1	1	2100	2	0.55	1	5	1	6	6	5	3	3	1	1	2	4	2	2	5	5	6
63	14	1	IX B	DON BOSC	2	2	2	1	1	9500	1	0.45	1																
64	13	1	IX B	DON BOSC	2	3	2	1	5	5000	2	0.3	1	5	4	6	6	2	6	2	1	5	3		5	5	4	3	6
65	14	1	IX B	DON BOSC	2	2	1	1	5	4000	1	1	3	5	4	6	6	4	6	1	5	1	5	6	6	6	6	6	6
66	14	1	IX B	DON BOSC	2				1	45000	1	1	1	4	3	6	6	6	6	6	3	6	6	3	3	6	3	3	6

67	13	1	IX B	DON BOSC	2	1	1	2		4000	1	0.05	2	6	5	6	6	6	1	2	1	3	4	6	6	2	6	3	6
68	14	2	IX A1	EVRN GOV.	2	1	2	1	5	2000	2	0.3	1	6	6	6	6	1	6	1	6	1	3		5	5	5	5	6
69	14	2	IX A1	EVRN GOV.	2	2	3	1	1	2000	3	1	1	5	1	6	6	1	1	1	1	1	5	5	5	1	5	5	6
70	13	2	IX A1	EVRN GOV.	2	2	1	4		5000	2	0.1	1	5	1	6	6	5	1	1	1	1	5	5	5	1	5	5	6
71	13	2	IX A1	EVRN GOV.	2	3	2	2	5	8500	2	0.15	2	6	6	6	6	1	4	2	5	4	1	6	5	4	6	6	6
72	14	2	IX A1	EVRN GOV.	2	1	1	1		1500	3	0.05	2	5	1	6	6	5	1	1	1	1	5	5	5	1	5	5	6
73		2	IX A1	EVRN GOV.	GIRLS HR.	2	2	3	5	4000	3	0.15		5	1	6	6	5	2	3	4	2	3	2	1	3	6	3	3
74	15	2	IX A1	EVRN GOV.	2	2	2	5	5	5000	2	0.2	2	6	6	6	6	6		4	6	5	4	5	5	5	4	5	6
75	14	2	IX A1	EVRN GOV.	2	2	1	1	5	5000	1	0.2	2	5	6	6	6	6	5	3	5	4	1	1	1	1	2	1	6
76	12	2	IX A1	EVRN GOV.	2	2	2	1	5	10000	1	0.15	2	5	2	6	6	6	4	3	2	4	1	2	3	1	6	3	6
77	14	2	IX A1	EVRN GOV.	2	2	1	1		5000	3	0.45	1	4	5	6	6	6	4	3	1	6	5	6	6	6	5	5	6
78	13	2	IX A1	EVRN GOV.	2	2	2	1	5	3500	1	0.1	1	6	5	6	6	6	4	5	5	4	5	6	6	4	5	6	6
79	14	2	IX A1	EVRN GOV.	2	2	2	2	5	7000	2	0.05	1	6	6	6	6	6	2	2	2	1	1	6	2	2	4	4	6
80	14	2	IX A1	EVRN GOV.	2	2	2	2	5	4000	2	0.05	1	6	5	6	6	6	4	2	6	5	1	6	2	2	4	4	4
81		2	IX A1	EVRN GOV.	2	1	1	1	5	1000	3	0.15	1	6	5	6	5	5	2	2	3	2	2	3	2	2	3	3	6
82	14	2	IX A1	EVRN GOV.	2	1	1	2	5	9000	1	0.15	2	6	5	6	6	5	1	1	1	1	5	5	5	1	5	1	6
83	14	2	IX A1	EVRN GOV.	2	2	2	1	5	4000	4	0.3	1	6	6	6	6	6	6	4	6	6	4	6	4	5	6	5	6
84	13	2	IX A1	EVRN GOV.	2	2	1	2	5	5000	1	0.1	2	5	5	6	6	6	5	3	6	4	6	6	6	5	5	6	5
85	14	2	IX A1	EVRN GOV.	2	1	1	1	1	12000	2	0.3	1	6	6	6	6	6	3	6	6	5	4	6	6	6	6	4	4
86	14	2	IX A1	EVRN GOV.	2	2	2	1	5	4000	4	1	3	6	6	6	6	6	4	6	6	5	6	4	5	6	5	6	6
87	15	2	IX A1	EVRN GOV.	2	1	2		2	30000	3	0.3	1	4	1	6	6	6	1	2	6	1	3		3	1	6	2	6
88	14	2	IX A1	EVRN GOV.	2	2	2	1	1	2000	4	0.2	1	6	6	6	6	6	6	4	6	6	4	6	4	5	6	5	6
89		2	IX A1	EVRN GOV.	2	3	2	2	5	10000	2	0.1	1	6	2	6	6	3	2	3	2	2	2	6	2	2	6	3	6
90	14	2	IX A1	EVRN GOV.	2	2	1	5	5	5000	3	0.15	2	6	3	6	6	5	1	1	1	1	5	5	1	1	5	5	6
91	13	2	IX A1	EVRN GOV.	1		2	3	5	2000	1	0.15	2	6	6	6	6	5	1	1	1	1	5	5	1	1	5	1	6
92	14	2	IX A1	EVRN GOV.	2	2	2	1		4000	2	1	1	6		6	6	3	1	2	1	5	1	5	1	1	5	5	1
93	14	2	IX A2	EVRN GOV.	1	2	1	1	5	6000	1	0.2	2	6	3	6	6	5	3	1	3	5	1	1	1	4	6	6	6
94	14	2	IX A2	EVRN GOV.	2	2	1	1	5	6000	2	0.2	2	6	3	6	6	1	1	1	4	3	1	1	1	3	6	6	6
95	14	2	IX A2	EVRN GOV.	2	1	1	1		4000	1	0.15	2	6	5	6	6	6	6	6	6	6	5	5	6	6	5	5	5
96	13	2	IX A2	EVRN GOV.	2	1	2	1	5	3000	2	0.3	2	6	6	6	6	5	5	1	2	1	2	6	6	6	5	3	5
97	13	2	IX A2	EVRN GOV.	2	1	1	2	5	5000	2	0.3	2	6	6	6	6	5	5	3	6	4	3	4	4	1	4	6	6
98	14	2	IX A2	EVRN GOV.	2	2	2	1	5	3700	3	0.45	1	6	3	6	6	1	1	1	4	3	1	1	1	3	6	6	6
99	14	2	IX A2	EVRN GOV.	2	1	1	1		6000	2	0.2	2	6	1	6	6	4	6	3	6	6	1	6	1	1	6	6	6
100	13	2	IX A2	EVRN GOV.	2	1	1	2		5000	2	0.1	2	6	1	6	6	5	4	4	6	5	6	6	1	2	6	6	6
101	14	2	IX A2	EVRN GOV.	2	2	4		6	20000	2		3	5	1	6	6	2	2	1	5	1	3	4	4	5	5	1	2
102	15	2	IX A2	EVRN GOV.	2	1	2	5	5	5000	2	0.3	1	6	5	6	6	6	6	5	6	6	6	6	5	5	4	3	6
103	13	2	IX A2	EVRN GOV.	2	3	4	4	2	40000	2	0.3	1	5	6	6	6	6	4	2	2	5	2	3	6	5	6	5	6
104	12	2	IX A2	EVRN GOV.	2	1	1	1	2	36000	1	0.2	1	5	1	6	6	3	5	3	1	3	5	5	4	5	3	5	6
105	15	2	IX B	EVRN GOV.	2	2	2	3	1	24000	4	5	1	6	5	6	6	5	2	5	2	4	5	6	3	5	5		3
106	15	2	IX B	EVRN GOV.	2	1	1	1	2	1500	2	0.2	1	5	5	6	6	5	5	3	3	6	5	5	5	5	5	6	6
107	15	2	IX B	EVRN GOV.	2	2	1	2		1500	1	0.15	1	5	6	6	6	5	5	3	3	6	5	5	5	5	5	6	6
108	13	2	IX B	EVRN GOV.	2	1	1	2	5	5000	4	0.2	2	5	5	6	6	6	4	3	3	3	5	5	5	4	5	5	6
109	13	2	IX B	EVRN GOV.	2	1	1	1	1	3000	1	0.3	2	5	5	6	6	6	4	3	3	3	5	5	5	4	5	5	6
110	13	2	IX B	EVRN GOV.	2	1	1	3	1	500	1	0.2	2	5	6	6	6	6	5	6	3	3	5	5	5	4	5	5	6
111	14	2	IX B	EVRN GOV.	2	2	2	4	5	8000	3	0.2	2	5	5	6	6	6	4	3	3	3	5	5	5	4	6	5	6
112	14	2	IX B	EVRN GOV.	2	2		1	6	10000	2	0.1	1	1	1	6	6	6	1	5	6	6	1	6	6	6	6	6	6
113	15	2	IX B	EVRN GOV.	2	2	1	1	5	1500	1	2	1	6	6	6	6	6	5	4	6	6	5	6	5	5	6	6	6
114	14	2	IX B	EVRN GOV.	2	1	1	1	1	3000	1	0.15	1	5	5	6	6	5	4	3	3	5	4	4	4	4	6	5	6
115	14	2	IX B	EVRN GOV.	2	1	1	1	5	10000	1	0.15	2	5	5	6	6	5	4	3	3	5	4	4	4	4	6	5	6
116	13	2	IX B	EVRN GOV.	2	2	2	2		12000	2	5	1	1	1	6	6		5	5	5	6	5	6	6	5	6		4
117	13	2	IX B	EVRN GOV.	2	1	1	1	5	10000	2	0.15	1	5	1	6	6	6	3	1	1	6	5	6	6	6	6	6	6
118	13	2	IX B	EVRN GOV.	2	5	5	1	5	6000	2	0.3	3	6	6	6	6	6	6	3	6	3	3	6	6	6	6	6	6
119	15	2	IX B	EVRN GOV.	2	1	1	1	5	5000	2	0.25	2	6	6	6	6	6	6	3	6	3	3	6	6	6	6	6	6
120	13	2	IX B	EVRN GOV.	2	1	2	2	1	1000	1	0.3	1	5	1	6	6	6	3	1	1	6	1	6	2	1	2	4	6
121	14	1	IX B	EVRN GOV.	2	1	1	1	5	3000	2	0.3	2	6	5	6	6	4	4	4	5	4	5	6	5	5	4	4	6
122	15	2	IX B	EVRN GOV.	2	1	1	2	1	6000		0.3	2	1	1	6	6	4	1	1		1	4	5	5	5	4	4	5
123	13	2	IX C	EVRN GOV.	2	2	2	1	1	5000	2	1	1	4	4	6	6	3	3	3	3	3	3	3	3	6	6	4	6
124	14	2	IX C	EVRN GOV.	2	1	1	1		6000	2	1	3	6	2	6	6	5	5	4	4	5	5		4		4		4
125	15	2	IX C	EVRN GOV.	2	2	2	2	5	1000	4	0.15	1	6	3	6	6	3	6	2	5	3	5	3	2	3	3	5	3
126	13	2	IX C	EVRN GOV.	2	1	1	1	5	4000	1	0.3	1	6	3	6	6	3	6	2	6	3	6	3	2	3	4	5	3
127	13	2	IX C	EVRN GOV.	GIRLS HR.	2	2	1	1	3000	2	0.3	1	5	5	6	6	5		2	6	3	3	3	3	3	5	5	4
128	14	2	IX C	EVRN GOV.	2	2	2	1	5	3000	2	0.3	1	6		6	6	6			2		2		6	2	6		6
129	13	2	IX C	EVRN GOV.	2	2	1	2	5	10000	2	1	1	6	3	6	6	3	5	4	6	4	3	4	3	4	5	5	3
130	12	2	IX C	EVRN GOV.	2	2	2	2	2	2000	1	0.15	1	4	5	6	6	5	5	2	5	4	5	5	6	6	5	5	6
131	13	2	IX C	EVRN GOV.	2	2	1	1	5	3000	1	1.3	2	5	6	6	6	5	5	1	6	5	3	5	5	4	5	6	6
132	14	2	IX C	EVRN GOV.	2	1	1	1	1	6000	3	1.3	1	6	6	6	6	3	3	3	3	3	5	5	5	5	3	6	5
133	13	2	IX C	EVRN GOV.	2	2	2	5	2	7000	2	5	1	6	6	6	6	6	6	6	6	2	5	5	5	5	5		6

134	13	2	IX C	EVRN GOV.	2	1	1	1	5	24000	1	0.2	2	5	6	6	6	5	5	1	6	5	3	5	5	4	5	6	6
135	13	2	IX C	EVRN GOV.	2	1	2	1	1	6000	1	0.3	1	4	5	6	6	6		1	5	5	3	4	2	4	6	6	6
136	13	2	IX C	EVRN GOV.	2	1	1		2	2500	2	0.15	1	4	5	6	6	3	4	3	2	4	4			4	4	5	6
137	12	2	IX C	EVRN GOV.	2	2	1	1	1	20000			3	4		6	6	5	5	5	5	5	5	4	5	5	4	4	6
138	13	2	IX C	EVRN GOV.	2	2	2	1	5	2300	1	0.2	2	6	5	6	6	6	6	5	5	6	5	6	5	5	5	5	6
139	15	2	IX C	EVRN GOV.	2	1	2	1	5	1500	1	0.05	1	5	6	6	6	5	5	1	6	6	5	4	3	6	5	5	6
140	14	2	IX C	EVRN GOV.	2	1	1	1	5	2500	2	1.3	1	5	2	6		6	4	3	5	4	3	5	3	3	5		6
141	14	2	IX C	EVRN GOV.	2								2	6	4	6	6	4	4	5	3	5	3	6	3	3	4	4	6
142	14	2	IX C	EVRN GOV.	2	2	2	1	2	8000		1	1	6	4	6	6	4	4	5	3	5	3	6	3	2	4	4	6
143		2	IX C	EVRN GOV.	2	1	1	1	1	3000	2	0.3	2	5	1	6	6	4	1	2	1	2	2	4	2	2	5	5	6
144	15	2	X1 A1	EVRN GOV.	2	2	2	4	5	2000	6	0.15	2	5	6	6	6	5	5	1	1	1	1	6	5	5	6	5	6
145	16	2	X1 A1	EVRN GOV.	2	1	1	4	5	3000	2	0.3	2	5	4	6	6	5	4	1	1	5	1	5	2	4	2	4	6
146	16	2	X1 A1	EVRN GOV.	2	2	2	1	5	5000	2	0.15	2	5	1	6	6	5	4	1	1	6	1	5	2	4	4	6	6
147	15	2	X1 A1	EVRN GOV.	2		2		5		2	0.15	2	5	1	6	6	5	4	1	1	5	1	5	4	1	6	5	6
148	15	2	X1 A1	EVRN GOV.	2	1	1	1	5	4000	3	0.15	2	5	1	6	6	4	5	1	1	5	1	5	1	4	6	6	6
149	15	2	X1 A1	EVRN GOV.	2	2	1	1	5	3000	1	0.3	2	5	4	6	6	5	4	1	1	5	1	5	1	2	6	5	5
150	15	2	X1 A1	EVRN GOV.	2	1	1	1	5	3000	3	0.15	1	5	5	6	6	6	4	2	5	2	4	5	4	4	5	6	6
151	15	2	X1 A1	EVRN GOV.	2	2	2	4	5	5000	3	0.3	1	6	1	6	6	6	3	1	2	3	4	6	6	4	6	6	3
152		2	X1 A1	EVRN GOV.	2	2	2	1	1	3000	2	1.3	1	6	1	6	6	6	3	1	2	3	4	6	6	4	6	6	3
153	16	2	X1 A1	EVRN GOV.	2	2	2	1	5	2000	4	0.45	1	5	5	6	6	6	6	2	3	6	6	5	6	4	6	6	6
154	15	2	X1 A1	EVRN GOV.	2	2	2	1	5	2000	2	0.1	1	6	5	6	6	4	2	1	1	1	5	5	3	3	5	1	1
155	15	2	X1 A1	EVRN GOV.	2	1	1	2	5	6000	1	0.15	1	6	6	6	6	5	1	1	5	5	1	3	1	2	1	6	4
156	16	2	X1 A1	EVRN GOV.	2	1	1	1	5	4000	2	0.15	1	6	6	6	6	4	4	1	6	5	2	2	3	2	3	6	6
157	16	2	X1 A1	EVRN GOV.	2	2	1	1	5	3000	2	0.15	6	6	6	6	6	4	4	1	4	6	1	1	4	4	4	5	6
158	15	2	X1 A1	EVRN GOV.	2	2	4	4	2	6000	3	0.15	1	6	5	6	6	5	1	1	1	1	5	5	3	3	5	1	1
159	16	2	X1 B1	EVRN GOV.	2	2	2	2	5	5000	3	0.15	1	6	5	6	6	4	6	2	2	1	1	4	1	1	6	6	6
160	16	2	X1 B1	EVRN GOV.	2	1	1	2	5	8000	1	0.1	2	6	5	6	6	6	1	2	3	3	1	5	5	5	5	4	6
161	15	2	X1 B1	EVRN GOV.	2	1	1	1	5	6000	2	0.45	1	6	3	6	6	6	3	1	3	1	1	6	1	6	6	6	6
162	16	2	X1 B1	EVRN GOV.	2	1	2	3	5	5000	4	0.2	2	6	5	6	6	6	1	2	3	3	1	5	5	5	5	4	6
163	17	2	X1 B1	EVRN GOV.	2	2	2	4	2	15000	4	0.3	2	4	3	6	6	6	4	1	1	1	1	6	6	3	4	4	6
164	15	2	X1 B1	EVRN GOV.	2	2	2	3	5	5000	4	0.2	2	6	5	6	6	6	1	2	2	2	2	2	6	6	6	6	6
165	15	2	X1 B1	EVRN GOV.	2	2	2	2	5	3000	3	0.1	2	5	5	6	6	5	4	3	5	3	4	2	1	3	5	5	6
166	16	2	X1 B1	EVRN GOV.	2	2	2		2	7000	4	0.25	3	6	6	6	6	6	4	1	1	1	3	6	1	4	5	4	6
167	15	2	X1 B1	EVRN GOV.	2								2	6	6	6	6	6	6	1	1	6	6	6	6	6	6	6	6
168	15	2	X1 B1	EVRN GOV.	2								2	6	1	6	6	6	6	1	1	6	6	6	6	6	6	6	6
169	16	2	X1 B1	EVRN GOV.	2	2	3	2	2	15000	3	1	1		6	6	6	6	4	1	1	1	3	6	1	1	3	1	6
170	16	2	X1 B1	EVRN GOV.	2	1	1	1	5	2000	5	1	1																
171	16	2	X1 B1	EVRN GOV.	2	1	1	1		6000	2	0.15	1	4	5	6	6	4	5	1	1	1	2	2	1	1	5	5	6
172	16	2	X1 B1	EVRN GOV.	2	1	1	1		7000	2	0.3	1	4	6	6	6	4	5	1	1	1	2	2	1	1	5	5	6
173	15	2	X1 B2	EVRN GOV.	2	1	1	1	5	2000	1	0.3	1	5	3	6	6	3	2	1	1	5	4	3	5	6	3	1	5
174	15	2	X1 B2	EVRN GOV.	2	1	1	2	5	3000	1	0.15	1	5	6	6	6	5	2	1	1	4	5	5	5	5	5	5	6
175	15	2	XI B2	EVRN GOV.	2	1	2	1	5	10000	1	1	1	5	1	6	6	3	5	5	6	6	1		5	2	6	3	4
176	15	2	X1 B2	EVRN GOV.	2	2	2		2	12000	2	0.2	2	5	1	6	6	5	1	1	4	6	1	6	4	4	6	6	6
177	16	2	X1 B2	EVRN GOV.	2	2	1	1	5	3000	2	1	2	6	6	6	6	6	6	3	1	6	3	6	4	6	6	6	6
178	16	2	X1 B2	EVRN GOV.	2	2	2	2	5	3000	2	1	3	5	6	6	6	4	3	3	5	2	2	5	6	6	5	5	5
179	17	2	X1 B2	EVRN GOV.	2	2	1	1	2	2500	2	0.15	1	6	6	6	6	5	6		5	5	5	5	5		5	6	4
180	15	2	X1 B2	EVRN GOV.	2	2	1	1	5	3000	0	0.3	1	6	1	6	6	6	6	1	5	5	4	5	3	5	6	6	4
181	16	2	X1 B2	EVRN GOV.	2	3	3	5	3	8000	2	0.1	2	6	1	6	6	6	6	1	5	5	4	5	3	5	4	6	4
182	15	2	X1 B2	EVRN GOV.	2	2	2	1	1	8000	2	0.3	1	6	1	6	6	6	6	1	5	5	4	5	3	5	4	6	6
183	15	2	X1 B2	EVRN GOV.	2	2	1	1	1	8000	2	0.3	1	6	1	6	6	6	6	1	5	5	4	5	3	5	4	6	6
184	15	2	X1 B2	EVRN GOV.	2	1	1		2	3000	2	0.1	1	5		6	6	6	5	1	1	6	5			4	5	5	6
185	16	2	X1 B2	EVRN GOV.	2	2	2	1	1	5000	2	0.3	1	6	6	6	6	6	5	2	5	5	3	5	3	3	2	5	6
186	15	2	X1 B2	EVRN GOV.	2	2	2		1	7000	1	0.45	2	5	5	6	6	5	2	2	4	1	4	2	2	2	6	4	4
187	16	2	X1 B2	EVRN GOV.	2	1	1	1	2	1500	1	1	1	5	5	6	6	4	3	2	3	4	3	2	3	3	5	5	5
188	16	2	X1 B2	EVRN GOV.	2	1	1	1	5	2000	1	0.15	1	5	5	6	6	4	3	2	5	4	5	2	3	3	5	5	5
189	16	2	X1 B2	EVRN GOV.	2	2	1	2	1	1000	2	0.3	1	5	5	6	6	4	3	2	3	4	3	4	3	3	5	5	5
190	15	2	X1 B2	EVRN GOV.	2	2	2	1	5	3000	3	0.15	1	5	1	6	6	5	1	1	4	6	5	6	6	6	6	6	3
191	15	2	X1 B2	EVRN GOV.	2	2	2	2	3	10000	2	0.1	2	1	1	6	6	5	6	3	1	1	2	1	1	1	5	5	6
192	16	2	X1 B2	EVRN GOV.	2	1	1	1	1	3000	2	1	1	5	5	6	6	3	5	5	5	5	3	3	3	3	3	5	5
193	15	2	X1 B2	EVRN GOV.	2	1	1	1	5	3000	2	0.1	1	5	5	6	6	3	5	5	5	5	3	3	3	3	3	5	3
194	16	2	X1 B2	EVRN GOV.	2	1	1	1	1	3000	2	1	1	6	5	6	6	3	5	5	5	5	3	3	3	3	3	5	3
195	15	2	X1 B2	EVRN GOV.	2	1		2	2	1000	4	0.2	2	5	4	6	6	5	2	3	5	5	5	5	3	3	5		6
196	15	2	X1 B2	EVRN GOV.	2	1	1	2	2	10000	2	0.45	1	5	4	6	6	5	2	3	5	5	5	5	3	3	5	5	6
197	15	2	X1 B2	EVRN GOV.	GIRLS HR.	2	1	1	2	3000	1	0.3		6	6	6	6	5	6	5	6	6	5	6	6	5	6	1	6
198	14	2	X1 B2	EVRN GOV.	2	2		1	5	3000	1	0.3	1	6	2	6	6	5	6	6	5	6	4	6	5	5	5	6	6
199	16	2	X1 C1	EVRN GOV.	2	2	2	2		22000	3	0.1	1	6	1	6	6	6	5	5	6	5	3	5	4	3	5	5	5
200	15	2	X1 C1	EVRN GOV.	2	2	2	1		3000	3	1	1	6	6	6	6	3	5	5	6	5	3	3	4	3	5	5	2

201	15	2	XI C	EVRN GOV.	2	1	1	1	5	2500	2	0.15	1	5	6	6	6	6	6	3	5	5	4	5	5	4	3	5	6
202	15	2	XI C	EVRN GOV.	2	1	1	5	5	20000	1	0.1	1	5	6	6	6	5	5	1	4	3	5	5	5	4	5	6	6
203	16	2	XI C1	EVRN GOV.	2	4	2	4		30000	4	0.2	2	1	6	6	6	2	2	1	4	6	4	3	2	1	5	5	6
204	15	2	XI C1	EVRN GOV.	2	2	2	5	5	4000	3	0.15	1	4	5	6	6	5	3	1	5	4	1	3	5	2	6	5	6
205	15	2	XI C1	EVRN GOV.	2	2	2	1	1	3000	1	0.3	1	6	6	6	6	6		5	3	6	6	1	1	2	3	6	6
206	16	2	XI C1	EVRN GOV.	2	3	3	2	5	5000	4	0.05	1	6	6	6		5	4	3	3	3	1	4	5	5	4	5	6
207	15	2	XI C1	EVRN GOV.	2	2	2	1	5	6500	2	0.25	2	6	5	6	6	4	1	3	1	6	1	6	1	4	6	6	6
208	15	2	XI C1	EVRN GOV.	2	2	2	5	5	9000	1	0.1	1	6	5	6	6	5	6	5	5	3	4	2		2	5	6	6
209	15	2	XI C	EVRN GOV.	2	2	1	3	5	4000	1	0.25	1	5	2	6	6	6	2	3	2	4	2	5	2	2	5	4	6
210	16	2	XI C1	EVRN GOV.	2	1	2	1	5	3000	3	0.3	1	6	5	6	6	5	2	1	5	3	1	3	3	2	6	5	6
211	16	2	XI C1	EVRN GOV.	2	2	1	1	5	6000	1	0.3	1	3	5	6	6	6	5	5	1	3	6	6	2	4	5	2	4
212	16	2	XI C1	EVRN GOV.	2	2	2	2	2	10000	2	0.1	1	4	5	6	6	6	6	3	5	5	4	6	5	5	6	6	6
213	15	2	X1 C1	EVRN GOV.	2	1	2	1	5	4000	2	0.3	1	4	5	6	6	6	6	3	6	6	3	3	3	2	6	2	6
214	16	2	X1 C1	EVRN GOV.	2	1	2	1	5	4000	1	0.3	2	6	6	6	6	6	6	1	1	1	2		3	4	6	4	6
215	17	2	XI C1	EVRN GOV.	2	1	2	5	5	4000	2	0.15	2	6	1	6	6	6	1	4	1	4	3	6	4	3	2	6	6
216	16	2	X1 C1	EVRN GOV.	2	2	1	2	5	6000	4	0.3	1	3	2	6	6	6	4	2	3	6	2	3	5	4	6	6	6
217	15	2	X1 C1	EVRN GOV.	2	2	2	4	5	15000	2	0.15	1	3	3	6	6	6	5	5	1	5	5	3	3	3	5	5	6
218	15	2	X1 C1	EVRN GOV.	2	2	2	4	5	3200	1	0.2	1	4	5	6	6		5	5	5	5	1	4	6	4	6	5	6
219	16	2	XI C2	EVRN GOV.	2	2	1	1	1	7500	1	0.3	1	6	5	6	6	1	4	1	1	4	1	1	1	2	5	1	5
220	15	2	XI C2	EVRN GOV.	2	1	1	5	5	7000	1	0.15	1		6														
221	15	2	XI C2	EVRN GOV.	2	2		1		2000	1	0.3	1	6	6	6	6	4	6	4	4	5	4	5	5	4	5	5	6
222	16	2	XI C2	EVRN GOV.	2			2	5	4000	1	0.3	2	6	6	6	6	3	3	3	1	6	4	4	3	3	4	5	4
223	15	2	X1 C2	EVRN GOV.	2	1	1		1	3500	2	0.15	1	6	6	6	6	6	6	3	5	3	1	3	4	5	6	6	4
224	16	2	XI C2	EVRN GOV.	2								1	6	6	6	6	5	4	5	4								
225	16	2	X1 C2	EVRN GOV.	2									4	6	6	6	4	5	4	4	6	6	6	6				
226	16	2	X1 C2	EVRN GOV.	2	2	2	1	5	4000	3	1	1	6	6	6	6	6	5	3	5	3	1	3	4	5	6	6	4
227	16	2	X1 C2	EVRN GOV.	2								1	6	6	6	6	6	1	1	1	1	1	1	1	6	1	6	6
228	16	2	X1 C2	EVRN GOV.	2	2	2	1	1	3000	1	0.3	1	6	6	6		6	4	5		6	6		6	5	5	5	6
229	16	2	X1 C2	EVRN GOV.	2	2	2	1	1	3000	1	0.3	1	6	3	6	6	5	6	4	4	5	3	3	5	4	6	5	3
230	16	2	XI C2	EVRN GOV.	2	1	1	1	1	3000	0	0.15	1	5	5	6	6	5	5	1	5	1	5	6	1	5	5	6	1
231	15	2	X1 C2	EVRN GOV.	2	2	2	1	5	3000	2	0.2	1	5	1	6	6	5	6	1	4	6	2	2	2	3	6	3	2
232	15	2	X1 C2	EVRN GOV.	2	1	1	1	1	8000	3	0.3	1	6	4	6		4	6	4	4	5	5	4	3	4	5	6	
233	16	2	X1 C2	EVRN GOV.	2	1	1	2	5	5000	2	0.3	2	5	5	6		6	6	2	4	6	6	6	6	5	6	6	6
234	15	2	X1 C2	EVRN GOV.	2	2	2	2	1	10000	5	1	1	6	5	6	6	5	2	1	4	6	1	4	2	3	6	6	2
235	15	2	X1 C2	EVRN GOV.	2	1	1	1	1	5000	1	1.3	3	2	5	6	6	2	5	6	6	2	2	2	2	2	2	2	2
236	15	2	X1 C2	EVRN GOV.	2	2	1	2	5	20000	3	0.3	1	6	6	6	6	5	6	4	5	5	4	4	4	6	5	2	5
237	15	2	X1 C2	EVRN GOV.	2								1	5	6	6	6	6	4	5	2	1	1	6	3	6	6	6	1
238	16	1	X1 A1	GOV. HR. S	2	1	2	2	1	8000	3	0.3	1	5	4	6	6	5	3	3	3	4	3	4	3	4	4		6
239	16	1	X1 A1	GOV. HR. S	2	1	1	1	1	1500	1	1	1	6	6	6	6	6	4	4		4	6	3	6	6	6	6	6
240	15	1	X1 A1	GOV. HR. S	2	1	1	1	1	3000	1	0.15	1	6	1	6	6	6	1	6	1	6	1	6	1	6	6	6	6
241	16	1	X1 A1	GOV. HR. S	2	2	1	1	5	3000	3	0.3	1	6	6	6	6	6	6	6	6	5	5			6	6	6	5
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246	16	1	X1 A1	GOV. HR. S	2	2	1	2	5	5000	1	1	1	5	4	6	6	5	4	3	3	1	1	2	2	1	1	1	6
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249	13	1	IX A1	GOV. HR. S	2	2	2	5	5	2000	2	0.15	1	6	3	6	6	6	3	3		6	3	6	3	3	6	6	3
250	13	2	IX A1	GOV. HR. S	2	2	2	2	5	8000	2	0.3	1	6	6	6	6	6	5	6	2	6	2	6	6	6	6	6	5
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254	15	1	XI A2	GOV. HR. S	2	4	2	5	2		3	0.2	1	5	3	6	6	5	5	2	2	6	6	6	5	6	4	2	5
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n17tv	n18brightl	n19hc	n20routine	n21othslp	n22clock	n23slpalon	n24sleepal	n25stayup	bedtime	n26sleep	waketime	n27weekst	weekbt	n28weekw	weekwt	n29stayup	n30trouble	n31ready	n32enjoy	n33delay	n34howlon	n35settlin	n36sleepy	n37liedow	n38trouble	n39help	n40fall	n41lightou	n42turn
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n43restles	n44mgt	n45kick	n46wakeu	n47soundly	n48usually	n49tbsleep	n50comfor	n51family	n52bksleep	n53scared	n54rollove	n55wakeu	n56ready	n57rested	n58jcgg	n59help	n60gob	n61comwa	n62sitread	n63tv	n64pubpla	n65passen	n66circum	n67sittalk	n68sitquie	n69homewor
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