Prevalence, Severity & Associated Factors of Sleep Quality Among Adults in Jimma Town, Southwest Ethiopia: A Community Based Cross-Sectional Study.

By

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Jimma, Ethiopia

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Abstract

Background: Estimated 150 million people worldwide and nearly 17% of the populations in the developing nations are currently suffering from sleep problems. In Ethiopia, the magnitude of this problem was not identified entailing the need for study.

Objectives: The main aim of the present study was to determine magnitude, severity & associated factors of sleep quality among adults.

Method: A community based cross-sectional study was conducted in Jimma town, Southwest Ethiopia in Jimma 2016. Population proportional to size and random sampling procedures were used to enroll 422 sampled respondents in to the study. Data were collected by trained enumerators using validated & pretested Pittsburg Sleep Quality Index (PSQI) and Insomnia Severity Index (ISI), entered into EpiData and analyzed using SPSS Version 20 for Windows. Frequency, percentages, mean with standard deviation, bi-variable (at p-value<0.25) & multi-variable (at p<0.05) logistic regression procedures at 95% confidence interval were used to characterize sleep quality and other variables.

Result: The overall prevalence of poor sleep quality (PSQI score >5) was 65.4% with higher proportion among males 79(63.0%) and 40-49 years age groups 174(28.6%). From poor sleepers only 11(4.0%) were identified to have severe insomnia (ISI score ≥14). A multivariable logistic regression analysis indicated that age category of 40-49 years AOR=2 [95% CI (1.1, 3.6)], (p= 0.03), monthly income ≤ 1000 ETB AOR= 2.2 [95% CI (14, 3.5)], (p=0.01), current khat chewing AOR=1.8 [95% CI (1.1, 3.1)], (p=0.03), daily khat chewing AOR= 3.4 [95% CI (1.2, 11.1)], (p=0.04) and obesity AOR=1.2 [95% CI (1.3, 2.5)], (p=0.03) were identified risk factors of poor sleep quality.

Conclusion: There was high proportion of poor sleep quality in the study community. Age of 40-49 years, low income, khat chewing and obesity were identified as risk factors of poor sleep quality. Therefore, the concerned steak holders should work towards poverty reduction, create awareness for weight reduction and develop legislation for khat control.

Acknowledgement

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Acronyms

AHI	Apnea Hypopnea Index
AOR	Adjusted Odd Ratios
BMI	Body Mass Index
BP	Blood Pressure
COR	Crude Odd Ratios
DBP	Diastolic Blood Pressure
EPHA	Ethiopian Public Health Association
ESS	Epworth Sleepiness Scale
HEWs	Health Extension Workers
HHs	Households
ISI	Insomnia Severity Index
mmHg	Millimeter of Mercury
Non-REM	Non Rapid Eye Movement
OSA	Obstructive Sleep Apnea
PPS	Probability Proportional to size allocation
PSQI	Pittsburgh Sleep Quality Index
REM	Rapid Eye Movement
SBP	Systolic Blood Pressure
TSP	Total Sleep Time
WK	Week
WFHC	Waist for Hip circumference

Chapter 1: Introduction

1.1 Background Information

Sleep is part of what is called the sleep–wake cycle. In contrast to wakefulness, which is a time of mental activity and energy expenditure, sleep is a period of inactivity and restoration of mental and physical function. It has been suggested that sleep provides time for entering information that has been acquired during periods of wakefulness into memory and for reestablishing communication between various parts of the brain. Sleep also is a time when other body systems restore their energy and repair their tissues. Muscle activity and digestion decrease and sympathetic nervous system activity is diminished (1). Many hormones, such as growth hormone, are produced in a cyclic manner correlating with the sleep–wake cycle, suggesting that growth and tissue repair may occur during sleep. Another hormone produced towards the end of the night is the stress hormone cortisol which begins to increase in preparation for the anticipated stress of the day, usually capped by a particularly large increase (up to 50%) about 20-30 minutes after waking, known as the cortisol awakening response (2).

There are two types of sleep: rapid eye movement (REM) and Non-REM sleep. Non-REM sleep is a quiet type of sleep characterized by a relatively inactive, yet fully regulating brain, and fully movable body, whereas REM sleep is associated with rapid eye movements, loss of muscle movements, and vivid dreaming (3). Anatomically, the sleep–wake cycle involves brain structures in the thalamus, associated areas of the cerebral cortex, and interneuron's in the reticular formation of the midbrain, the Pons, and the brain stem the ventrolateral preoptic nucleus of the hypothalamus is also one area of the brain that is particularly involved in the switch between wakefulness and sleep (4). Neurons in this small area help to promote sleep by inhibiting activity in areas of the brainstem that maintain wakefulness. Neurotransmitters that are involved in driving wakefulness and sleep including histamine, dopamine, nor epinephrine, serotonin, glutamate, orexin and acetylcholine, among others (5). Sleep disorders have a wide range of causes, including medical and psychological conditions.

 Some sleep disorders are caused by restriction of the upper airway while sleeping. Others are caused by genetic conditions. Other factors that affect sleep are age, medications, diet, and environmental factors, such as shift work Sleep disorders cover a

broad spectrum of symptoms including the inability to fall asleep and stay asleep, circadian rhythm and sleep–wake transition disorders, sleep-related breathing and movement disorders, and excessive sleepiness. While sleep disorders have existed for centuries, it is only within the last 3 to4 decades that attention has focused on their diagnosis and classification (6).

International classification of sleep disorders classifies sleep disorders into eight major categories, insomnia, parasomnias, sleep-related breathing disorders, hypersomnia of central origin not due to circadian rhythm, disorder or other cause of disturbed nocturnal sleep, sleep-related movement disorders, isolated symptoms, apparently related to normal variants and unresolved issues, circadian rhythm sleep disorders, other sleep disorders (7).

The diagnosis of sleep disorders usually is based on an adequate sleep history and physical examination. A sleep diary or sleep log often is helpful in describing sleep problems and arriving at a diagnosis. In some cases, sleep laboratory studies may be needed to arrive at an accurate diagnosis (8).

The Pittsburgh Sleep Quality Index (PSQI) is an effective instrument used to measure the quality and patterns of sleep in adult. It differentiates "poor" from "good" sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, and sleep disturbances, use of sleep medication, and daytime dysfunction or sleep terrors (9). Most sleep disorders include one or more of the following symptoms; fatigue, inability to fall asleep at night, inability to stay asleep at night, excessive daytime sleepiness, loud snoring or gasping sounds during sleep, sleep attacks, or unintended episodes of falling asleep, loss of muscle control or inability to move, unusual behaviors such as sleepwalking (10).

1.2. Statement of the problem

Many sleep disorders are brain disorders that cause interruptions in sleep patterns. They prevent people from getting enough sleep. Most people require 7 to 10 hours of sleep per day. The brain regulates sleep and is the major organ known to require or benefit from sleep. Not getting enough sleep can affect quality of life and untreated sleep disorders can also cause serious health problems and medical issues (11).We don't know very much about sleep problems on a global level, particularly among developing nations. A new study addressed this gap in research, and returned some striking and sobering results, estimating that as many as 150 million people worldwide are currently suffering from sleep problems (12). Researchers at the UK's University of Warwick Medical School conducted large-scale, multi-national study of sleep problems among eight countries in Asia and Africa. In order to assess the frequency of sleep problems in these areas of the world where sleep issues have been under-examined. Their results showed an overall rate of nearly 17 percent of the populations in these developing nations suffering problems with sleep. This is a figure not too far from the average 20 percent of the populations of the developed world that is believed to struggle with sleep problems of one form or another (13). The levels of sleep difficulties experienced in developed nations like united states of America estimated 50 to 70 million population are chronically suffering from a sleep disorders (15). The prevalence of sleep problems in mostly rural areas of developing nations is under estimated, researchers found a great deal of variation in the frequency of sleep difficulties. Some areas experienced very low levels of sleep problems and other have conspicuous sleep problem. In South Africa, 31.3% of women and 27.2% of men reported difficulty with sleep. These rates are substantially higher than other African countries. Overall rates of sleep problems in the remaining African nations of Tanzania, Ghana and Kenya ranged between 8.3% and 12.7% and it is more prevalent than heart disease, cancer, AIDS, neurologic disease, breathing problems, diabetes, and gastrointestinal problems (15).

Chapter 2: Literature review

2.1. Magnitude and Socio demographic related factors of sleep quality

Sleep problems are common among general population and approximately one-third of adults report some form of insomnia as reported by study conducted on medical students as global perspective in America. In the same area, sleep disorder was reported to affect millions of Americans across all socio-demographic groups where adults contributed 25-30% (16).

According to the National Commission on sleep disorder research, more than 80 million Americans complain of sleep difficulties (4). Similarly a cross-sectional study conducted in India showed that the prevalence of insomnia to be 14% and commonly to associated with hypertension, anxiety & depression directly affect office & home activities (17). Poor quality sleep disorder was also reported in 52.7% of students participated in a cross-sectional survey conducted to assess the epidemiology of sleep quality, sleep patterns, consumption of caffeinated beverages, and khat use among Ethiopian college students (18). Study conducted in china reported being female to be risk factor for sleep disorder (19) but a study conducted in Lahore university showed the existence of sleep disorders in both sexes (20). The prevalence of various sleep disorders in the population along with the prevalence in general populations in parenthesis are as follows as reported by study conducted among substance abusers in Cleveland, USA. Sleep impairment (PSQI<5) was noted in 15% of the subjects, and 10–15 had insomnia of moderate-to-severe degree. Symptoms suggestive of sleep apnea were reported in 4–6% of the subjects and restless leg syndrome symptoms (21).

The prevalence of poor sleep quality in china population was 41.5% with a higher rate observed in elderly females (45.8%) than that of elderly males (35.8%). The prevalence rate increased with age, from 32.1% in those aged 60–69 years to 52.5% in those aged ≥80 years. It also showed less duration of education pose about 1.04 times risk while living alone to cause 1.62 times poor sleep quality than their counterpart (22).

Study done in Britain indicates that individuals with higher socioeconomic status and education levels sleep better than those of lower socioeconomic status. The study also found that gender, younger age and being single negatively affect sleep. Women reported more sleep problems than men (22 % versus 16 %), especially between the ages of 40 and 65 year (23).

Across sectional study done in China among 1023 nurses, the prevalence of poor sleep was 56.7 %. Of these, 315 nurses (34.13 %) were rotating shift workers; Multivariate logistic regression revealed that rotating shifts were independent risk factors for poor sleep quality (24).

2.2. Factors associated with sleep quality

2.2.1. Substance use

Substance abuse is on the rise and affects every aspect of society and it is a major public health problem with high morbidity and mortality. Co-morbid disorders are suspected to cause a high relapse rate. Subjects with sleep disorders tend to self-medicate with (25) alcohol (26). As a study conducted in Yemen, khat chewers experience depressive mood, irritability, anorexia and difficulty to sleep at the end of khat session. Lethargy and a sleepy state follow the next morning (27).

In Ethiopia a cross-sectional study conducted in Dera woreda, Amhara region of Ethiopia among khat chewers, 92.8% of the respondents were reported to manifest sleeping disorder (28).

Similarly the cross-sectional study conducted on the prevalence of daytime sleepiness among college students in Ethiopia showed high day time sleeplessness while few were classified as evening Chrono types. As to this daytime sleepiness (ESS≥10) was present in 26% of the students with 25.9% in males and 25.5% in females. A total of 30 (0.8%) students were classified as evening Chrono types (29).

The research conducted among Ethiopian college students to examine associations of poor sleep quality with consumption of caffeinated beverages and other stimulants among 2,230 students, 1,175 (52.7%) were classified as having poor sleep quality (PSQI >5). When comparing subjective measures of self-rated sleep quality with PSQI global scores, poor sleep quality was underreported by 41.3% of students relative to PSQI classification.

Approximately 25% of the very good and 60% of the fairly good self-ratings for overall sleep quality had PSQI scores > 5 (30).

Sleep and body mass index in adolescence: Results from a large population-based study of Norwegian adolescents indicate both short sleep duration, insomnia and OSA symptoms increased the odds of being categorized as underweight, overweight and obese, respectively (31).

From total of 515 colleges student in Southwestern United States, One-third of the participants had BMI ≥25, and 51% were poor-quality sleepers (PSQI >5) that shows sleep disturbances were associated with overweight according to the sleep (32).

Two-hundred patients with a confirmed diagnosis of severe and chronic insomnia without co-morbidity showing objectively impaired sleep quality were compared findings suggested that patients with chronic insomnia do not exhibit overweight (33).

According to the research done in Brazil to evaluate the effect of smoking habits on sleep from 1492 adults to the Sleep Institute were accessed for the association of smoking status and smoking severity with sleep was analyzed for sleep parameters especially apnea and hypopnea index (AHI) ≥ 5, more than 5% of total sleep time spent with oxyhemoglobin saturation <90%, and arousal index (34).

Another research done by the title Cigarette Smoking Habit and Subjective Quality of Sleep in Iran, Tehran , PQSI global score reflecting sleep quality was poorer in the individuals with a current cigarette smoking with significantly decrease the quality of sleep and still could be worsened with increasing the number of cigarettes smoked per day (35).

2.2.2. Hypertension

A decreased sleep duration and quality was reported in a cross-sectional study conducted in USA as of association with increased body weight and adiposity. Being overweight or obese was reported independent predicators of sleep disorders as a study conducted in china population by self-reported sleep quality and overweight assessment (36).

Similarly in US 37% of individuals with sleep disorder were reported to be obese individuals as a cross-sectional study conducted in 2009-2010. From the cross-sectional

study conducted in US being diabetic was reported because either disturbance or sleep disorder in 32% of population and summarized the risk of sleep disturbance to be above two times in hypertension (37).

Similar cross sectional study done in north Central Nigeria among 400 subjects in the age group 18-70 years had 43 (10.8%) stage 2 hypertension and a substantial proportion of the subjects had poor sleep quality associated with high blood pressure and increased body mass index (38).

According to a Multi-Country study on, and sleep problems among adults aged 50 years or over in nine countries there is significant association with sleep problems and hypertension, obesity in the majority of the countries (39).

2.2.3. Body composition.

Across sectional study conducted in Canada shows among obese individuals 32% had either sleep disturbance or sleep disorder respectively. In conclusion, the impact of sleep disorders on diabetes may be explained through the individuals' obesity status (37).

A population-based twin study on sleep duration and body composition stated Short sleep duration was associated with increased body fat and decreased lean body mass in women but not in men and Sleep duration was largely influenced by environmental factors while adiposity measures were mainly influenced by genetic factors (40).

Research done in Brazil show body mass index, body fat percentage, waist circumference, and waist to-hip ratio were correlated with apnea-hypopnea index (r=0.40, p=0.03; r=0.46, p this study showed important statistical associations between different sleep variables and anthropometric characteristics in healthy subjects, suggesting a possible relationship between greater body fat deposition and impairment of sleep quality (41).

2.3. Conceptual frame work
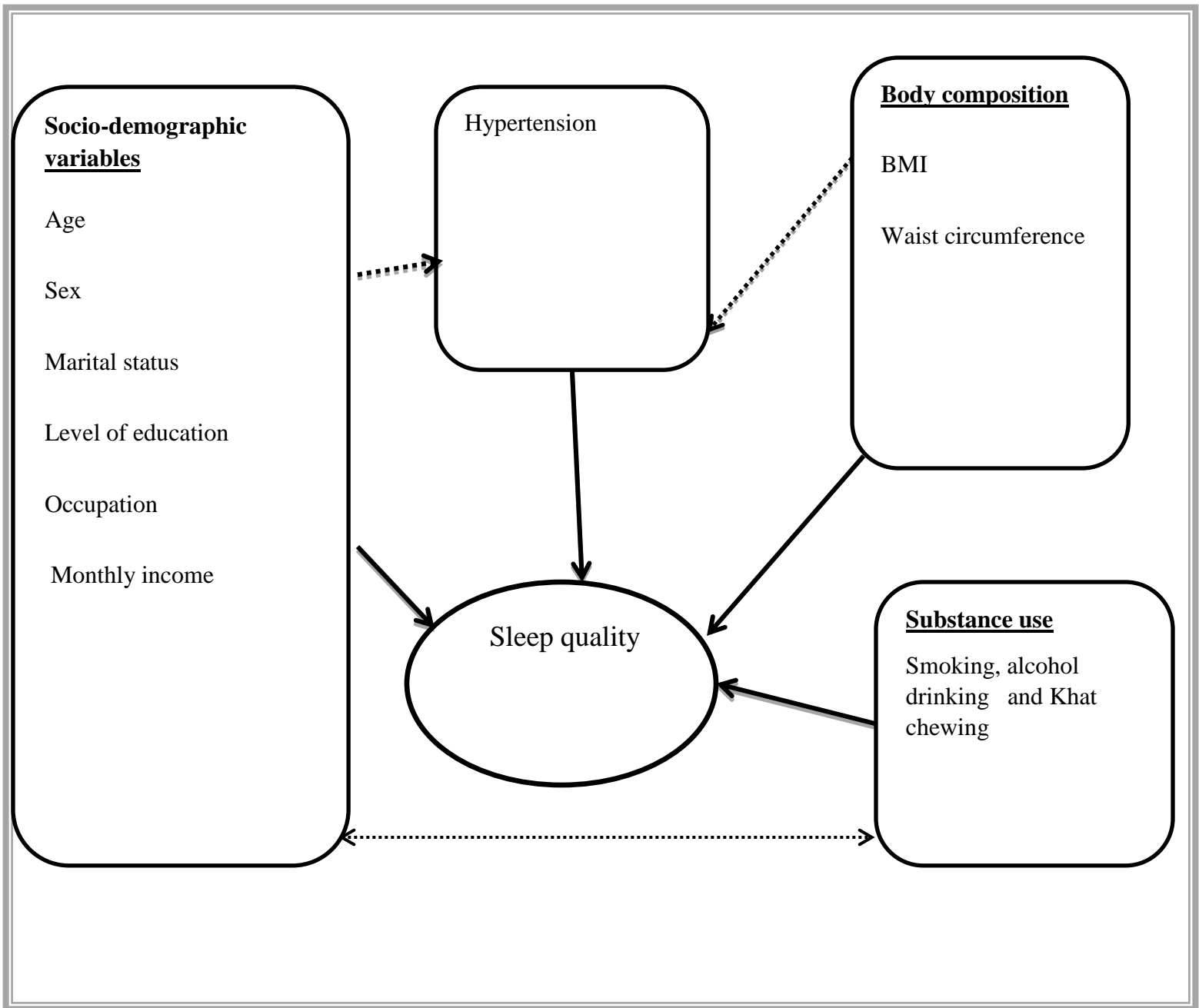
Figure 1: Constructed conceptual framework for factors associated with sleep quality among adults in Jimma town, April, 2016.

2.4. Significance of the study

This study determined magnitude, severity and associated factors of sleep quality among adult population of Jimma town which is not done so far in Ethiopia. The findings of this study assist policy makers and other stakeholders by giving relevant information for future planning and interventions on these problems. It also provides a base line data to conduct nationwide studies on the related topics.

Chapter 3: Objectives

3.1 General objective

The aim of the present study was to determine the prevalence, severity and associated factors of sleep quality among adults in Jimma town, Southwest Ethiopia, Jimma 2016.

3.2. Specific objectives

1) To determine the prevalence and severity of sleep quality
2) To measure the association between sleep quality and socio-demographic variables
3) To evaluate the association between sleep quality and substance use
4) To determine the association between sleep quality and body composition
5) To determine the association between sleep quality and hypertension

Chapter 4: Research methods

4.1 Study area and period

The study was conducted in Jimma town, one of the towns in Oromia national regional state. Jimma is located 357 Km South West of Addis Ababa and has total surface area of 4,623 hectares. It has a latitude and longitude of 7°40′N 36°50′E. The town is divided in to 17 kebeles. The population of the Jimma town is estimated to be 120,960 and with 32192 households.

4.2 Study design

A community based cross-sectional study design was employed.

4.3 Population

4.3.1 Source population

The source population was all households in kebeles of Jimma town.

4.3.2 Study population

The study populations were selected households heads/ representatives.

4.4 Inclusion and Exclusion criteria

Inclusion criteria

Households resided in the kebele for more than six months were included.

Exclusion criteria

Household head who resided in the kebele for less than six months, mentally impaired individuals or severely ill and households with the household head below 18 or above 64 years old were excluded from the study.

4.5 Sample size determination and sampling procedure

4.5.1 Sample size determination

Sample size (n) was determined using single population proportion formula using 14.7% prevalence of poor sleep quality among households based previous study at 95% of confidence interval and 5% margin of error. Finally, two times design effect and 10% non-response rate were considered to register 422 study participants.

P = Proportion of households with poor sleep quality (14.7%) (13).

q = (1- 0.147) = 85.3%

Z = the standard normal deviation (Z = 1.96) at 95% confidence level

d = 5% degree of precision, 95% confidence interval

n = the required sample size. Assuming a non-response rate of 10%, the minimum sample size required for the study became 192 households

n = $(z \, \alpha/2)^2$ p (1-p)/d^2 = (1.96)2 x (0.853) (0.147)/ $(0.05)^2$=192; 192+10%non- response rate =211 households by considering design effect 2 times the final sample size is 422.

4.5.2 Sampling procedure

Simple random sampling using lottery method was used to select six study kebeles. After the study kebeles were identified, proportional sample was allocated to the six selected kebeles using population proportional to size based on the number of households with in the selected kebeles. The sampling frame for the study was all households from the existing lists of households from registration book of health extension workers in the selected kebeles of the town. The study households were selected by systematic random sampling technique using computer generated method from the sampling frame in the selected kebeles.

```
                    Kebeles of Jimma town

                           SRS

  Bacho      AwetuMend   HirmataMarkato   Mentina    GinjoGuduru   MendraKochi
  Bore       (2585HHs)   (1522HHs)        (3629HHs)  (2533HHs)     (2830 HHs)
  (5391HHs

           Probability Proportional to size allocation (PPS)

  123 HHs    59HHs       35HHs        82HHs      58HHs       65HHs

                 Systematic random sampling method

                      Total of 422 HHs
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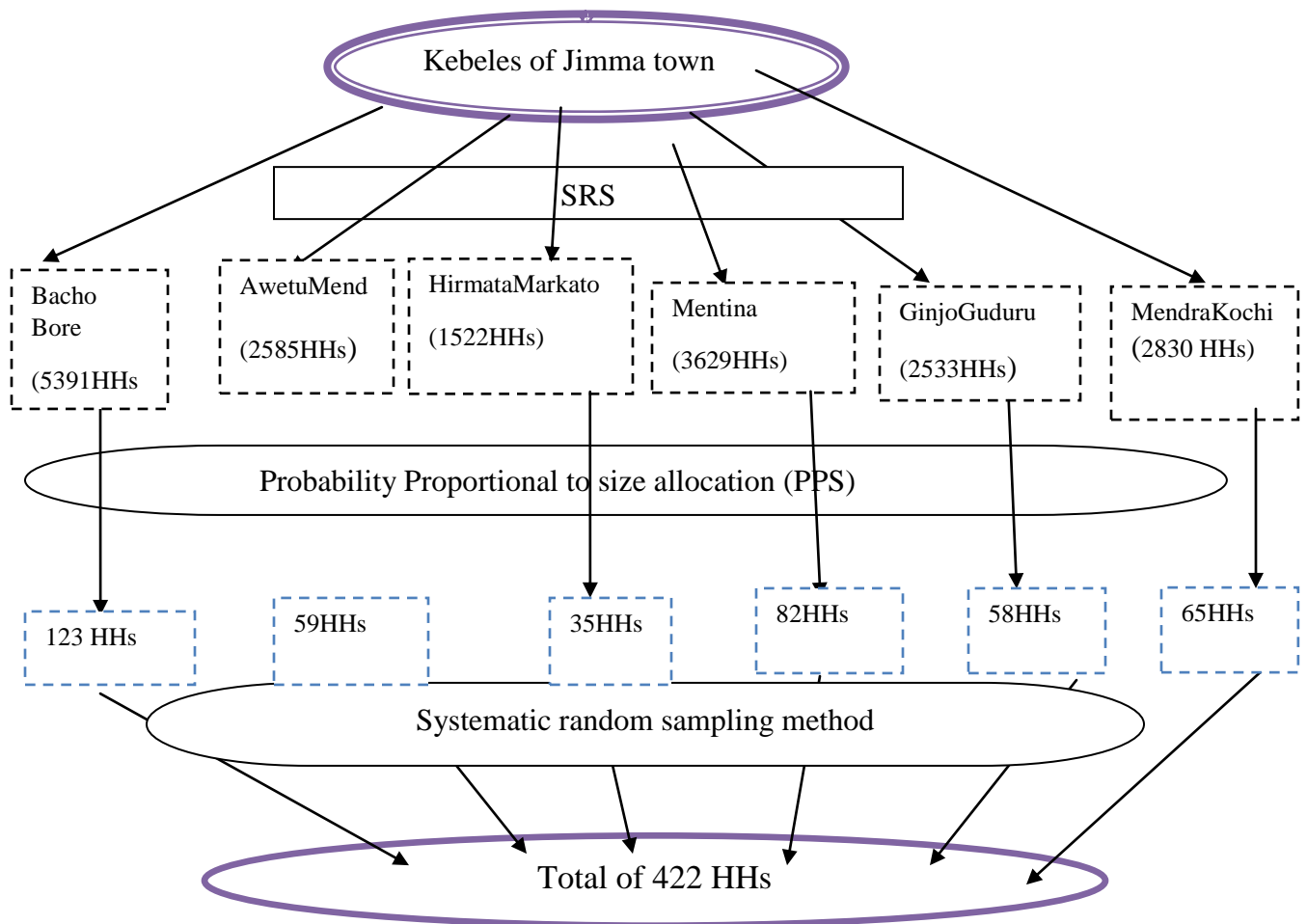
Figure 2: Schematic sampling procedure for sleep quality and associated factor among Jimma town population, April 2016

4.6. Data collection and Measurement

4.6.1. Study variables

Dependent variable

Sleep quality

Independent variable

Socio-demographic characteristics

- ✓ Age, Sex, Marital status, Level of education, Occupation and Monthly income

Hypertension

Substance use

- ✓ Smoking, alcohol drinking and Khat chewing

Body composition

- ✓ BMI and waist circumference.

4.6.2. Plan for data collection (instrument, technique)

The data were collected by trained 6 Diploma Nurses employed from the study area. Data collectors briefed objectives & purpose of the study to HHs head and request for informed consent to collect data. After consent was obtained, face-to-face interview was conducted using a structured and pretested questionnaire (9).

Finally the data collectors measured weight (to the nearest 0.1 gm), Height (to the nearest 0.1 centimeter) and BP (to the nearest 0.5 mmHg) of interviewed participants.

4.7. Data processing and analysis

Data was edited, coded and entered into EpiData version 3.1 exported to and analyzed by SPSS version 20. During the process of management, frequencies & percentages were calculated to describe the data by tables or figures. Bivariate analysis was performed separately using binary logistic regression to rank the relative importance of exposure variables with outcome variable using unadjusted odds ratios. The variables which have statistically significant (a p-value of < 0.25) associations with the outcome variable in the Bivariate analysis were further considered a candidate for stepwise multiple logistic regression model to control the effect of confounding variables.

Finally, the variables which have statistically significant (a p-value of < 0.05) associations with the sleep disorder were considered as a potential risk factors of sleep disorder.

4.8. Data quality control

The questionnaire were initially prepared in English, translated to local language Afan Oromo & Amharic, and retranslated to English by another person, who was blind to the original questionnaire, for consistency check. Pre-test of the questionnaire was made on 5% of sample size at one kebele (which was out of the study kebele) and take corrective actions accordingly by PI. Once the quality of questionnaire was confirmed, two days training given for 6 data collectors and 1 supervisors by PI focusing on the objective of the study, interview & measurement techniques.

Completeness, accuracy, clarity and consistency of every filled questionnaire were checked by the supervisors on daily basis. Checking for completeness and consistency of variables during data entry and analysis were continued before actual data analysis.

4.9. Ethical Clearance

Implementation of proposal was carried out after getting approval from the ethical clearance committee of Jimma University. An official letter of collaboration and permission request to Jimma town administration office and respective kebeles was obtained from Department of Physiology. Informed verbal consent was sought from the respondents/caretakers by data collector after explaining the objectives and purpose of the study as laid out in information sheet prepared and printed out by PI. Illiterate participants were additionally had the full information sheet read to them; literate subjects were given time to read the information sheet, that was translated to local language, in their own time. The participants were assured that they have full right to participate or withdraw from the study. The data was collected and kept confidential.

4.10. Dissemination of research findings

The findings of the study will be submitted to Jimma university department of Physiology for evaluation of student's academic exercise. After approval was obtained from JU, further dissemination will be made to Jimma town administration, Jimma health office, EPHA, Ethiopia medical association and other concerned organization.

4.11. Operational Definition

Pittsburgh Sleep Quality Index (PSQI). This is a validated, self-administered / interview questionnaire used to measure sleep quality. It is a seven-item questionnaire with each item rated from 0 to 3 (sleep duration, sleep efficiency, sleep latency, sleep disturbance, daytime dysfunction, frequency of sleep medications, and subjective sleep quality). A score of ≤5 distinguishes healthy controls without sleep complaints from poor sleepers with sleep complaints (>5).

Insomnia Severity Index (ISI). This is a validated, self-administered questionnaire used to measure a subject's perception of symptom severity, distress, and daytime impairment. It is a seven-item questionnaire with a total score range from 0 to 28. A score of ≤14 distinguishes good sleepers from those with insomnia (>14).

Never smokers − Adults who have never smoked a cigarette or who smoked fewer than 100 cigarettes in their entire lifetime

Former smokers − Adults who have smoked at least 100 cigarettes in their lifetime, but say they currently do not smoke.

Nonsmokers − Adults who currently do not smoke cigarettes, including both former smokers and never smokers.

Current smokers–Adults who have smoked 100 cigarettes in their lifetime and currently smoke cigarettes everyday (daily) or some days (nondaily)

Life time prevalence of khat chewing -the proportion of population who has chewed khat on their life time.

Current prevalent of khat chewing-the proportion of population who are chewing khat with 30 precedes days.

Ever khat chewer -an individual consider as ever khat chewer even if he/she had chewed only once in his/her time.

Chapter 5: Results

5.1. Socio-demographic characteristics of respondents

A total of 422 respondents were enrolled into the study making 100% response rate. Of these enrolled 257(60.9%) were males while 165(39.1%) of them were females. The mean age of participant was 38.7 years (SD ± 12.5). More than half (69.4%) of participants were married. Majority of the study subjects were Oromo in ethnicity (68.5 %) followed by Amhara (15.4%).

Table 1: Socio-demographic characteristics of the sampled (n = 422) adults in Jimma town, Southwest Ethiopia, Jimma 2016.

Variables		Number	%
Age			
	19-29 years	120	28.4
	30-39 years	114	27.0
	40-49 years	112	26.5
	50 or above years	76	18.0
Sex			
	Male	257	60.9
	Female	165	39.1
Religion			
	Muslim	223	52.8
	Orthodox	119	28.2
	Others*	80	19.0
Ethnic group			
	Oromo	289	68.5
	Amhara	68	16.1
	Others**	65	15.4
Educational status			
	No formal education	106	25.1
	Primary education	174	41.2
	Secondary & above	142	33.6
Marital status			
	Married	293	69.4
	Unmarried	69	16.4
	Others***	60	14.2
Occupation			
	Government employee	92	21.8
	Housewife	127	30.1
	Merchant	150	35.5
	Others****	53	12.6
Monthly income			
	>1000 ETB	224	53.1
	≤1000 ETB	198	46.9

*=Protestant, catholic, wakefata & Jehovah, **= Gurage, Tigre, Walayita, Yemi & Dawuro, ***=Divorced & Widowed, ****= Daily laborer, Private employee & Home maid.

Among religion groups, 223(52.8%) were Muslim, 28.2% Orthodox and 16.1% other religion followers. Concerning educational status, 106 (25.1%) of respondents didn't attend formal education, whereas 174(41.2%) and 142(33.6%) of them attended primary, and secondary and above respectively. Regarding occupation majority of respondents 150 (35.5%) were merchants. The average monthly income of the recruited households was 1786.10 ETB (with SD± 1290.00) (Table 1).

5. 2. Prevalence of sleep quality

The participants went to bed on average at 10:20 pm, and rose in the morning at 5:50 am. Their average night sleep duration was 6.8 hours (SD ± 2.1).

Seven components of sleep quality in the present study were assessed and identified their sleep status. The average sleep latency of the participants was 25 minutes (SD ± 15.0), and only 81 (19.2%) of the participants were reported that their subjective sleep quality was very bad. In the present study, 329 (78.0%) of them reported that they had less than 7 hours of sleep per night, 217 (51.4%) had a low habitual sleep efficiency (<65%), and 100 (23.7%) used sleep medication within the past one month at the time of interview (Table 2). The mean scores of subjective sleep quality, sleep disturbances and daytime dysfunction were 1.5(SD ± 1.1), 1.4 (SD ± 0.9), and 0.9 (SD ± 0.8) hours respectively. The minimum & maximum sum score of PSQI was 0 & 20 respectively. The minimum score (individuals without any problem) was 6(1.4%), whereas, the maximum score (individuals with a lot problem) was 2(0.5%) participants.

Two hundred seventy six (65.4%) participants were assessed as poor sleepers by global PSQI score less than 5. The prevalence of poor sleepers was higher among males 174(63.0%) and the age group of 40-49 years 79 (28.6%).

Table 2: Sleep quality and its components scores among adults in Jimma town, Jimma, 2016

Variables(n=422)	Value	Number	%
Sleep duration	> 7 Hours	93	22.0
	6-7 Hours	72	17.1
	5-6 Hours	57	13.5
	< 5 Hours	200	47.4
Sleep latency	0	65	15.4
	1	157	37.2
	2	112	26.5
	3	88	20.9
Day time dysfunction	0	191	45.3
	1	138	32.7
	2	85	20.1
	3	8	1.9
Sleep efficiency	>85%	78	18.5
	75-84%	159	37.7
	65-75%	140	33.2
	<65%	45	10.7
Subjective Sleep quality	Very good	93	22.0
	Fairly good	128	30.3
	Fairly bad	120	28.4
	very Bad	81	19.2
Sleep disturbance	0	78	18.5
	1	159	37.7
	2	140	33.2
	3	45	10.7
Use of sleep medication	Not during the past month	375	88.9
	Less than once a week	30	7.1
	Once or twice a week	8	1.9
	Three or more times a week	9	2.1
Sleep quality score	Good sleep	146	34.6
	Poor sleep	276	65.4

5.3. Severity of sleep quality (Insomnia)

After identifying poor or good sleeper respondents, categorization for insomnia among poor sleepers was analyzed. Based on this, 126(45.7%) of study subjects hadn't any significant clinical insomnia, while 73(26.4%), 66(23.9%) & 11(4%) of participants had subthreshold, moderate and severe insomnia in respective orders. The current result also

indicated 104(37.6%) of poor sleepers had excessive daytime sleepiness (showed total sum score of insomnia severity index 10 or above) (Table 3).

Table 3: Insomnia severity index and their related clinical interpretation among adults in Jimma town, Jimma 2016

Variables	value	Number	%
Difficulty falling asleep	None	42	15.2
	Mild	64	23.2
	Moderate	58	21.0
	Severe	91	33.0
	very sever	21	7.6
Difficulty staying asleep	None	48	17.4
	Mild	69	25.0
	Moderate	38	13.5
	Severe	108	39.1
	very sever	13	4.7
Early waking up	None	50	18.1
	Mild	57	20.7
	Moderate	42	15.2
	Severe	91	33.0
	very sever	36	13.0
Satisfaction of sleep pattern	Very satisfied	48	17.4
	Satisfied	68	24.6
	moderately satisfied	77	27.9
	Dissatisfied	68	24.6
	very dissatisfied	15	5.4
Extent of sleep problem impairing quality of life	Not at all	71	25.7
	Noticeable	67	24.3
	a little somewhat	43	15.6
	Much	82	29.7
	very much noticeable	13	4.7
Extent of worry/distress on current sleep problem	Not at all	51	18.5
	Worried a little	68	24.6
	somewhat	71	25.7
	much	68	24.6
	very much worried	22	8.0
Extent of sleep problem interference on daily functioning	Not at all	83	30.1
	interfering a little	70	25.4
	somewhat	72	26.1
	much	33	12.0
	very much interfering	18	6.5
Insomnia severity score	0-7=No clinically significant insomnia	126	45.7
	8-14 = Subthreshold Insomnia	73	26.4
	15-21=Clinical insomnia(Moderate severity)	66	23.9
	22-28=clinical insomnia (severe)	11	4.0

5.2. Factors associated with sleep quality

5.2.1. Sociodemographic factors associated with sleep quality

In the bi-variable logistic regression analysis, variables such as age, sex, education, occupation and household monthly income were associated with sleep quality (p <0.25) as presented in table 4 particularly, age category of 40-49 [COR=1.6, 95% CI (0.9, 2.8), p=0.09] & ≥50 years [COR=1.4, CI (0.9, 2.6) p=0.23], female [COR=0.8,CI (0.5, 1.2) p=0.22], attaining primary education [COR=1.4, CI(0.9, 2.2), p=0.14], being merchant in occupation [COR=1.1, CI(0.3, 1.2) p=0.17], housewife [COR=1.1, CI(0.3, 1.3) p=0.22] and household monthly income less than 1000 ETB [COR= 2.2, CI(1.5, 3.4) p=0.22] were associated with poor sleep quality (Table 4).

Table 4: Associated between socio-demographic factors and poor sleep quality among sampled adults of Jimma town, Jimma 2016.

Variables		Global PSQI score			P-value	COR(95%C.I)
		Poor sleepers(n=276)	Good sleepers(n=146)	Total(N)=422		
Age category	19-29 years	72(26.1)	48(32.9)	120(28.4)		1.0
	30-39 years	73(26.4)	41(28.1)	114(27.0)	0.53	1.2(0.7, 2.1)
	40-49 years	79(28.6)	33(22.6)	112(26.5)	0.09*	1.6(0.9, 2.8)
	≥50 years	52(18.8)	24(16.4)	76(18.0)	0.23*	1.4(0.9, 2.6)
Sex	Male	174(63.0)	83(56.8)	257(60.9)		1.0
	Female	102(37.0)	63(43.2)	165(39.1)	0.22*	0.8(0.5, 1.2)
Education	No formal	71(25.7)	35(24.0)	106(25.1)	0.30	1.2(0.8, 2.2)
	Primary	119(43.1)	55(37.7)	174(41.2)	0.14*	1.4(0.9, 2.2)
	≥ Secondary	86(31.2)	56(38.4)	142(33.6)		1.0
Occupation	Government employee	68(24.6)	24(16.4)	92(21.8)		1.0
	House wife	86(31.2)	41(28.1)	127(30.1)	0.22*	1.1(0.3, 1.3)
	Merchant	88(31.9)	62(42.5)	150(35.5)	0.17*	1.1(0.3, 1.2)
	Others*	34(12.3)	19(13)	53(12.6)	0.32	1.1(0.4, 1.5)
Monthly income	>1000 ETB	128(46.4)	96(65.8)	224(53.1)		1.0
	≤1000 ETB	148(53.6)	50(34.2)	198(46.9)	0.00*	2.2(1.5, 3.4)

*= p-value <0.25

5.2.2. Substances use and its association with sleep quality

5.2.2.1 Khat chewing practices

As per the current study result, 287 (68%) respondents were khat chewers at least once in their life time. The overall past one month prevalence of khat chewing (current chewers) preceding the study was 51.2%. Of these 100(46.3%) chewers were practiced daily, whereas the remaining 57(26.4%) practiced 1-3 times per week & 59(27.3%) practiced 3-6 times per week. The amount of khat consumed at a time was estimated per cost in birr and 57(26.4%) of the chewers consumed khat that costs >25 birr per ceremony (Table 5).

The current study indicated that current khat chewers (54.0%) suffered from poor sleep quality [COR= 1.4, CI (0.9, 2.3), p=0.19]. Moreover, individuals who used to chew khat daily (46.6%) [COR=1.7, CI (0.8, 3.3), p=0.16] and cost above 25 ETB (30.2%) [COR=1.9, CI (0.9, 3.9) p=0.08] for khat have demonstrated higher proportion of poor sleep quality as indicated in table 5.

Table 5: Substance use and their association with sleep quality among adults in Jimma town, Southwest Ethiopia, Jimma 2016

Variables		Global PSQI score						p-value	COR (95% CI.)
		Poor sleepers(n=276)		Good sleepers(n=146)		Total(N)422			
		n	%	n	%	n	%		
Khat chewing status	Never	84	30.4	51	34.9	135	32.0		1.0
	Former	43	15.6	28	19.2	71	16.8	0.81	0.9(0.5, 1.7)
	Current	149	54.0	67	45.9	216	51.2	0.19*	1.4(0.9, 2.3)
Frequency of Khat chewing	1-3 times/wk	36	24.2	21	31.3	57	26.4		1.0
	3-6 times/wk	39	26.2	20	29.9	59	27.3	0.74	1.1(0.4, 2.4)
	Daily	74	49.6	26	38.8	100	46.3	0.16*	1.7(0.8, 3.3)
Cost of Khat per ceremony	≤ 15 Birr	86	57.7	44	65.7	130	60.2		1.0
	16-25	18	12.1	11	16.4	29	13.4	0.67	0.8(0.3, 1.9)
	>25	45	30.2	12	17.9	57	26.4	0.08*	1.9(0.9, 3.9)
Alcohol consumption status	Never	137	49.6	69	47.3	206	48.8		1.0
	Former	30	10.9	24	16.4	54	12.8	0.12*	0.6(0.3, 1.2)
	Current	109	39.5	53	36.3	162	38.4	0.08*	1.1(0.7, 1.6)
Kind of Alcohol consumed	Beer	69	63.3	40	75.5	109	67.3		
	Others*	40	36.7	13	24.5	53	32.7	0.12*	1.8(0.9, 3.7)
Amount of Coffee consumed per day	1-2 Cup/day	108	41.9	57	42.5	165	42.1		1.0
	3-4 Cup/day	83	32.2	54	40.3	137	34.9	0.38	0.8(0.5, 1.2)
	5 ≥ Cup/ day	67	26.0	23	17.2	90	23.0	0.14*	1.5(0.9, 2.7)

p-value <0.25, Others=Tela, Teji, katicala

5.2.2.2. Alcohol consumption

Higher proportions of current alcohol consumers (drink alcohol in the past 30 days preceding the study) (54%) were found to be poor sleepers. whereas association was observed in former consumers (12.8%) [COR=0.6, CI (0.3, 1.2) p=0.12] and current consumers (38.4%) [COR=1.1, CI (0.7, 1.6), P=0.08]. Beer was a kind of alcohol consumed by higher proportion (63.3%) of poor sleepers, whereas association was demonstrated by other kinds of alcohol (32.7%) [COR=1.8, CI (0.9, 2.7), p=0.12] as shown by table 5.

5.2.3. Body composition

Height, weight and waist circumferences were taken and body mass index was calculated for every participant from these measurements. Higher proportion of poor sleep identified among over weight (30.4%) groups. With regard to waist circumference, 70% of females and 40% of males were identified to be poor sleepers. Association between BMI and poor sleep quality was observed in obese group 7.6% [COR=0.6, CI (0.3, 13), p=0.02] and waist circumference was observed in male sex [40%, COR=3.0, CI (1.3, 3.7), p=0.08] as indicated in table 6.

Table 6: Body composition & BP measurements and their association with sleep quality among sampled adults in Jimma town, Jimma 2016

Variables		Global PQSI score						P-value	COR (95%CI.)
		Poor sleepers(n=276)		Good sleepers(n=146)		Total(422)			
		n	%	n	%	n	%		
Categories of BMI(kg/cm^2)	Normal	123	44.6	60	41.1	183	43.4		1.0)
	under weight	48	17.4	20	13.7	68	16.1	0.61	1.2(0.6, 2.1)
	Over weight	84	30.4	50	34.2	134	31.8	0.40	0.8(0.5,1.4)
	Obese	21	7.6	16	11.0	37	8.8	0.02*	0.6(0.3, 13)
Male waist circumference	<90 cm	112	60.0	23	33.0	135	53.0		1.0
	≥90 cm	74	40.0	46	67.0	120	47.0	0.08*	3.0(1.3, 3.7)
Female waist circumference	<80 cm	30	30.0	26	40.0	56	33.5		1.0
	≥80 cm	72	70.0	39	60.0	111	66.5	0.25	0.6(0.8, 3.2)
SBP	Normal	219	79.3	123	84.2	342	81.0		1.0
	Hypertension	57	20.7	23	15.8	80	19.0	0.22*	1.3(0.8, 2.4)
DBP	Normal	238	86.2	133	91.1	371	87.9		1.0
	Hypertensive	38	13.8	13	8.9	51	12.1	0.12*	1.6(0.8, 3.2)

*=p-value <0.25

5.2.4. Blood pressure

Blood pressure of the subjects in a sitting position was taken from the left arm at their home. For those with elevated BP appointment was given on the next day and the second

reading was taken. In this study 20.7% of the study subjects with systolic hypertension (SBP $\geq$ 140 mmHg) and 13.8% with diastolic hypertension (DBP $\geq$ 90 mmHg) were identified to be poor sleepers. Similarly association was observed in both systolic 20.7% [COR= 1.3, CI (0.8, 2.4), p=0.22] & diastolic hypertension [13.8%, COR=1.6, CI (0.8, 3.2), p=0.12] as shown in table 6.

5.2.5. Factors independently associated with sleep quality

All variables that had p < 0.25 in the bivariate analysis were included in to multivariate analysis for backward logistic regression. From total variables included into the logistic regression model, four variables were found to be statistically significant at the level of p<0.05. Accordingly: Age, Monthly income, BMI and khat chewing status of study subject were demonstrated statistically significant association with sleep quality. As of this fact, participants in the age category of 40-49 years were 2 times [AOR=2: 95% CI (1.1, 3.6), p= 0.03] more likely to experience poor sleep quality than a person whose age was between 19-29 years. It was also identified that households with monthly income of $\leq$ 1000 ETB is twice time more likely to develop poor sleep quality than households whose monthly income of above 1000 ETB. Similarly, currently khat chewer were about twice [AOR=1.8 95% CI (1.1, 3.1), p=0.03] more likely to experience poor sleep quality than those who never chewed khat. Of the current khat chewers, subjects who chew daily were 3.4 time more likely to experience poor sleep quality [AOR=3.4: 95% CI (1.2, 11.1), p=0.04] than a person who used to chew 1-3 times per week. Finally, an obese person (BMI >30 kg/cm^2) is one & half times [AOR=1.2: 95% CI (0.3, 2.5), p=0.03] more likely to incur poor sleep quality than a person with normal range body mass index (BMI=18.5-24.9 kg/cm^2) as shown in table 7. Some variables that demonstrated association in bi-variable analysis like sex, educational status, occupation, alcohol consumption & kind of alcohol consumed, amount of coffee consumed per day, Hypertension and waist circumference have not demonstrated statistically significant association with sleep quality in final model. Therefore, they were not considered as potential independent factor of poor sleep quality.

Table 7: Independent factor associated with poor sleep quality (sampled=422) among adults in Jimma town, Jimma, 2016.

Variables		Global PSQI score			Bi-variable result		Multivariable result	
		Poor sleepers(n=276) n (%)	Good sleepers(n=146) n(%)	Total n (%)	P-value	COR(95%C.I)	P-value	AOR(95%C.I)
Age category	19-29 years	72(26.1)	48(32.9)	120(28.4)		1.0		1.0
	30-39 years	73(26.4)	41(28.1)	114(27.0)	0.53	1.2(0.7, 2.1)	0.83	0.9(0.5,1.7)
	40-49 years	79(28.6)	33(22.6)	112(26.5)	0.09	1.6(0.9, 2.8)	0.03**	2.0(1.1, 3.6)
	50-64 years	52(18.8)	24(16.4)	76(18.0)	0.03	1.4(0.9, 2.6)	0.37	1.4(0.7, 2.8)
Monthly income	>1000 ETB	128(46.4)	96(65.8)	224(53.1)		1.0		1.0
	≤1000 ETB	148(53.6)	50(34.2)	198(46.9)	0.00	2.2(1.5, 3.4)	0.01**	2.2(1.4, 3.5)
Khat chewing status	Never	84(30.4)	51(34.9)	135(32.0)		1.0		1.0
	Former	43(15.6)	28(19.2)	71(16.8)	0.81	0.9(0.5, 1.7)	0.33	1.4(0.7, 2.7)
	Current	149(54.0)	67(45.9)	216(51.2)	0.19	1.4(0.9, 2.3)	0.03**	1.8(1.1, 3.1)
Frequency of Khat chewing	1-3 times/wk	36(24.2)	21(31.3)	57(26.4)		1.0		1.0
	3-7 times/wk	39(26.2)	20(29.9)	59(27.3)	0.38	0.8(0.5, 1.2)	0.18	2.3(0.7, 7.8)
	Daily	74(49.6)	26(38.8)	100(46.3)	0.14	1.5(0.9, 2.7)	0.04**	3.4(1.2, 11.1)
Categories of BMI(kg/cm^2)	Normal	123(44.6)	60(41.1)	183(43.4)		1.0		1.0
	under weight	48(17.4)	20(13.7)	68(16.1)	0.61	1.2(0.6, 2.1)	0.05	0.9(0.3, 2.2)
	Over weight	84(30.4)	50(34.2)	134(31.8)	0.40	0.8(0.5,1.4)	0.06	1.1(0.6, 1.8)
	Obese	21(7.6)	16(11.0)	37(8.8)	0.02*	0.6(0.3, 13)	0.03**	1.2(1.3,2.5)

*=p-value <0.25, **=statistically significant at p-value <0.05

Chapter 6: Discussions

Sleep is an important physiological process for humans. It is essential for normal life and very important for health; whereas sleep quality is an important clinical construct and essential part of quality of life. As to this, the current study has estimated the magnitude of sleep problem and associated factors among adult population. The prevalence of poor sleep quality among adults in the present study was 65.4 % (PSQI score >5), which is higher than the prevalence reported from the study conducted in China (25-30%) (17) on the general population. Literature indicate rural residents are more likely to report good levels of sleep quality when compare to urban residents (42) due to different factors such as sleep habits, sleep hygiene, cultural and racial differences, life-style, life quality and stresses. The higher percentage of sleep problem in the current study result could be explained as the results of differences in the aforementioned factors and study setting (the current study included participants only from urban setting unlike studies conducted in America & China that included participants from both urban and rural settings). The substantial higher proportion of the prevalence was observed among males (63.0%) unlike the study report conducted in South Africa (31.3% of women and 27.2% of men) (15). Similarly, higher prevalence of poor sleep quality was observed among females (45.8%) than in males (35.8%) in china unlike the current study result. This might be due to the nature of the study participants in the area; males are more responsible for leading family and substance users.

From 65.4 % participants of this study, 27.9 % have reported moderate to severe insomnia (ISI score ≥15), which is higher than Britain study report (10–15% moderate-to-severe degree insomnia) (21). The variation among the current result and others studies could be due to the differentials of study subjects from culture, substance use, socio-demographic or prevalence of other co-morbidities.

In this study sleep quality was significantly associated to age, monthly income, khat chewing and body mass index in multivariable logistic regression analysis. This study identified that sleep quality is not continuously increasing with age as it was reported by the study conducted in China (22). But age group in 40-49 years was identified as higher risk for poor sleep quality than younger ages. This could be due reduced melatonin levels as age increases comparing with younger ages. Even though the clear mechanism is un known, A variety of physiological and degenerative changes, might cause degeneration of

pathways from retina to pineal gland, and/or reduction of pinealocyte β-adrenergic receptor functions may contribute to lower plasma melatonin levels and this may lead to poor sleep quality(47). The other possible reason might be due testosterone decline at a rate of one percent per year leading to men hypo-gonadal. On line to this fact studies also indicated that lower levels of testosterone are connected to worse sleep consolidation in the form of reduced performance, and increased frequency of awakenings (43). Similarly the possible reason might be due premenopausal/menopause hormonal effects of Estrogen in women. The possible mechanism could be that Estrogen has been shown to decrease sleep latency, decrease the number of awakenings after sleep occurs, increase total sleep time and decrease the number of cyclic spontaneous arousals. During the luteal (low estrogen) phase in premenopausal women, a twofold increase in the number of arousals occurs, particularly when both estrogen and progesterone levels are low (44).

Monthly income was another sociodemographic factor that showed relation with sleep quality.

Individuals who earn ≤1000 ETB were twice poor sleeper than those with higher monthly income. Study conducted in Britain reported that people with higher socio-economic status have a better quality of sleep than that of the poor (23). This possibly occurs from mental satisfaction that could relate with higher quality of physical living environment including bedding and clothing which could affect thermoregulation.

Currently khat chewers have demonstrated association (1.8 time higher risk) for poor sleeping as of the current study result. This result agrees with the study conducted in Yemen and Northwest Ethiopia (27, 28). Furthermore, if a person chew khat every day, the quality of sleep deteriorates more. It was indicated that daily khat chewers had above three times risk of poor sleep quality than 1-3 time per week chewers. This study agrees with the study conducted in Ethiopia among college students (45). This could be the result of psycho-stimulant and euphorigenic effects of khat impairing with sleep center (48). Khat consumption leads to effects that are qualitatively similar to those of amphetamine, i.e. increased blood pressure, a state of euphoria and elation with feelings of increased alertness and arousal. This may be followed by depression, irritability, anorexia and difficulty in sleeping. Frequent use of high doses may evoke psychotic reactions (49). The euphoric effects of khat start after about one hour of chewing. Peak plasma levels of cathinone are obtained 1.5 to 3.5 hours after the onset of

chewing. Cathinone is barely detectable in blood after eight hours. First-pass metabolism of cathinone in the liver leads to the formation of nor ephedrine which will worsen quality of sleep.

Finally obesity was recognized to impair sleep quality. When compared to individual with normal BMI, obese individual carries 1.2 times risk to exhibit poor sleep quality. This result agrees with the study conducted in Unite State (40), but contradicts with the study conducted in Regensburg, Germany(46). The variation of the results may occur from individuals' action to manage their situation (obesity). Some manage their diets (e.g. avoiding fat food in the evening) and practice frequent exercise to reduce putative negative influences on sleep quality while others are not.

6.1 Strengths and Limitations

6.1.1 Strengths

Data were obtained from home based face-to-face interviews by qualified nurses, reliable measurements and well-controlled. The study provided useful information that will inform policy makers to design a strategy to reduce the prevalence of poor sleep quality.

6.1.2 Limitations

Some questions were based only on participants' response. Especially, participants' age was not verified as there was no birth certificate. Similarly, sleep quality assessment components were not ensured as the current study lacks follow up.

Chapter 7: Conclusions and Recommendations

7.1. Conclusions

The prevalence of poor sleep quality is relatively higher than any other prevalence reported before. It's prevalent among males than females and age of 40-49 years. Similarly, the severity of sleep disorder (insomnia) is common in Jimma town as compared to other areas' study result.

High prevalence of poor sleep quality was associated with factors from socio-demographic, substance use and body composition in wider view. Age, income, khat chewing and BMI were identified as risk factors of poor sleep quality in general and age category of 40-49 years, earning ≤ 1000 ETB monthly, current, & daily khat chewing and obesity were identified as risk factors of poor sleep quality in particular.

7.2. Recommendations

Federal ministry of health, Oromia reginal health bureau and Jimma town government sectors should invest on community training & capacity building to increase income and to create awareness for improving sleep quality. It is also salubrious if government develops khat free legislation which prohibits chewing in enclosed dwellings and parents consider khat free environment as a norm or reduce frequency of chewing for chewing adversely affect adults' health.

Health workers who deliver health care service in in Jimma town should effectively counsel adults to control their BMI in normal range. Finally, as sleep habits may be a marker for health status and quality of life, prospective studies are needed to better understand the complex interplay between sleep quality and presumed risk factors.

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Annexes

Annex 1. Consent form

Request to Participate

I am--------------------from _____ kebeles of Jimma town. I'm here to collect data for the study conducted on HHs -----------to---------. The study is trying to understand what and why sleep disorder is still high in our country. I would like to interview some HHs and Take some measurements.

Participation is voluntary and no negative consequences will be attached. Some questions will be asked on health & health related. Your answers will be written and later used for analysis. All the information provided will be handled as confidential and your individual answers will not be known to anyone apart from the interviewer and the PI of this study. The results will be used to improve health of the public to reduce the high sleep problem in the area. At least 40 minute will be required to discuss and record the information. The results of the study will be communicated to the different organizations after analysis. Do you have any questions?

If you agree with the information above and have no objections to participate, would you sign the consent form?

Consent Form

I understand the above information and agreed to participate in this study.

Signature………………………………….. Date (DD/MM/YY)………………….

Annex 2: Questionnaire for data collection

Jimma University College of Biomedical sciences Department of Physiology

Questionnaire for data collection on Prevalence, Severity & Associated Factors of Sleep Quality among Adults in Jimma Town, Southwest Ethiopia

Instruction I

The following questions relate to socio demographic variables& substance use,   your answers should indicate the most accurate reply for all questions.

1. Questionnaire Identification number_____

2. Date the data collected(DD/MM/YY)_____

3. Time the data collected (HH:MM) _____

4. Name of data collector(1^{st,} 2nd)_____

5. Signature of data collector_____

Part -I. Identification

1. Code number of the subject…………………………. ……………...

2. Upbringing or Address: Rural or Urban………………………

S/No.	Questions	Choice
Part II: Socio-demographic related		
100	Current residence	1. Urban 2. Rural
101.	Age	_____ in year
102.	Sex	1. Male 2. Female
103.	Educational status	1. No formal education 2. Primary 3. Secondary 4. College and above

104.	Religion	1. Orthodox 2. Muslim 3. Protestant 4. Catholic 5. Others(specify)_____
105.	Ethnicity	1. Oromo 2. Amhara 3. Tigre 4. Guraghe 5. Other(specify)_____
106.	Occupation	1. Government employee 2. Private employee 3. House wife 4. Daily laborer 5. House maid/servant 6. Merchant 7. Commercial sex worker 8. Other(specify)_____
107.	Marital status	1. unmarried 2. Married 3. Widowed 4. Divorced 5. Separated
108	Income (monthly in ETB)	_____ (in birr).
Part III: substance related questions		
109	Have you ever used chewing khat in your life?	1.yes 2.no➜115
110	Duration of khat use	…………….
111	Have you used Khat in the last 12 months?	1.yes 2.no➜115
112	Frequency of khat use	……………
113	If yes to Q 110, how much per cost do you take per chewing day?	
114	What is the quantity of khat do you chew at a time?	_____gms
115	Have you ever used alcohol drink?	1.yes 2.no➜120
116	If yes to question 114, Kind of alcohol you used?	....
117	Duration of alcohol use	……………………….
118	Frequency of alcohol use	……………………
119	Have you used any kind of alcohol drinks in the last 12 months	1.yes 2.no
120	Have you ever used Tobacco products such as cigarette	1.yes 2.no➜122
121	Duration of tobacco use	………………..
122	Have you used any kind of tobacco product in the last 12 months	1.yes 2.no➜120
123	Frequency of tobacco use	………………….

124	Do you have a habit of smoking Shisha (Ganga) currently?	1.yes 2.no➔126
125	If yes to Q 120; how many times do you smoke shisha	………………………
126	Do you have habit of drinking coffee?	1.yes 2.no
127	If yes to Q 126 how much cup	…………………
Part IV: Anthropometric measurements		
125	Weight	………………..kg
126	Height	…………………cm
127	Waist circumference	…………………..cm
128	BP(systolic / Diastolic)	………….../………..mmHg

The Pittsburgh Sleep Quality Index (PSQI)

Instruction II: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions. During the past month,

1. When have you usually gone to bed? _____
2. How long (in minutes) has it taken you to fall asleep each night? _____
3. When have you usually gotten up in the morning? _____
4. How many hours of actual sleep do you get at night? (This may be different than the

number of hours you spend in bed) _____

During the past month, how often have you had trouble sleeping because you…	**Not during The past month(0)**	**Less than once a week (1)**	**Once or twice a week (2)**	**There or more times a week (3)**
a. Cannot get to sleep within 30 minutes				
b. Wake up in the middle of the night or early morning				
c. Have to get up to use the bathroom				
d. Cannot breathe comfortably				
e. Cough or snore				

loudly				
f. Feel too cold				
g. Feel too hot				
h. Have bad dreams				
i. Have pain				
j. Other reason(s), please describe, including how often you have had trouble sleeping because of this reason(s):				
6. During the past month, how often have you taken medicine (Prescribed or "over the counter") to help you sleep?				
7. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?				
8. During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?				
	Very good(0)	**Fairly good (1)**	**Fairly bad (2)**	**Very bad (3)**
9. During the past month, how would you rate your sleep				

Quality overall?				

Component 1 #9 Score...C1_____

Component 2 #2 Score (≤15min=0; 16-30 min=1; 31-60 min=2, >60 min=3) + #5a Score

    (If sum is equal 0=0; 1-2=1; 3-4=2; 5-6=3).. C2_____

Component 3 #4 Score (>7=0; 6-7=1; 5-6=2; <5=3)...C3_____

Component 4 (total # of hours asleep)/ (total # of hours in bed) x 100

    >85%=0, 75%-84%=1, 65%-74%=2, <65%=3.. C4_____

Component 5 Sum of Scores #5b to #5j (0=0; 1-9=1; 10-18=2; 19-27=3)..............C5_____

Component 6 #6 Score ....C6___

Component 7 #7 Score + #8 Score (0=0; 1-2=1; 3-4=2; 5-6=3)...........................C7_____

    Add the seven component scores together _____ Global PSQI Score _____

Insomnia severity index

 Instruction III for each question, please circle the number that best describes your

answer. Please rate the current (i.e. last 2 weeks) severity of your insomnia problem(s)

Insomnia problem	**None**	**Mild**	**Moderate**	**Severe**	**Very Severe**
1.Difficulty falling asleep	0	1	2	3	4
2.Difficulty staying asleep	0	1	2	3	4
3. Problems waking up too early	0	1	2	3	4

4. How satisfied/dissatisfied are you with your current sleep pattern?

Very satisfied, satisfied, moderately satisfied, dissatisfied, very dissatisfied

0   1   2   3   4

5. How noticeable to others do you think your sleep problem is in terms of impairing the quality of your life?

Not at all, Noticeable, a little somewhat, much, very much noticeable

0 1 2 3 4

6. How worried/distressed are you about your current sleep problem?

Not at all, Worried a little, somewhat, much, very much worried

0 1 2 3 4

7. To what extent do you consider your sleep problem to interfere with your daily functioning (e.g. Daytime Fatigue, mood, ability to function at work/daily chores, concentration, memory, mood, etc.) Currently?

Not at all, interfering a little, somewhat, much very much interfering

0 1 2 3 4

Guidelines for scoring/interpretation:

Add the scores for all seven items (questions 1 + 2 + 3 + 4 + 5 +6 + 7) = _____ your total score

Total score categories:

0–7 = no clinically significant insomnia

8–14 = sub threshold insomnia

15–21 = clinical insomnia (moderate severity)

22–28 = clinical insomnia (severe)

የፈቃደኝነትማረጋገጫ

ጤና ይስጥልኝ,_____እባላለሁ።እዚህ የመጣሁት በእንቅልፍ ዙሪያ ስለሚደረገው ጥናት   መረጃ ስብሰቢ ሁኔ ነው።

በዚህ መጠይቅ ላይ ሰምዖ የማይጸፍ ሲሆን ማህበራዊና ዲምግራፊዊ ፣ንጥረ ነገርን በተመለከተ እና አካላዊ ልኬት አደርጋለሁ።

የእርስዎ ተሳትፎ ለዚህ ጥናት ከፍተኛ ዋጋ ያለው ሲሆን በሀረተሰቡ የሚደርሰውን የእንቅልፍ ማጣት ችግር ለመከላከል ከፍተኛ ሚና አለው። እርስዎ በማንኛውም ሰዓት መሳተፍ ካልፈለጉ የቃለመጠይቁን ሂደት ማቋረጥ ይችላሉ።

ለመሳተፍ ፈቃደኛ ነዎት

ሀ. አዎ   ለ. አይደለሁም

መልሶት አዎ ከሆነ መጠይቁን ይጀምሩ።

ቃለ መጠይቁ የተካሄደበት ቀን.........................

ቃለ መጠይቁን የጠየቀው ሰው ስም.............................

ፊርማ --------------------------------

ጤማሪ - II –አማርኛ መጠይቅ የጥናቱ ተሳታፌ መለያ ቁጥር ---------

ክፍል- II.ማህበራዊና ዲሞግራፊያዊ ሁኔታን የሚመለከት ጥያቄዎች

ጤማሪ - II –አማርኛ መጠይቅ የጥናቱ ተሳታፌ መለያ ቁጥር ---------

ክፍል- II.ማህበራዊና ዲሞግራፊያዊ ሁኔታን የሚመለከቱ ጥያቄዎች

S/N	ጥያቄዎች	ምላሾች
101	እድሜዎ ስንት ነው?	_____ዓመት
102	ፆታ	0. ወንድ 1. ሴት
103	ሃይማኖትዎ ምንድን ነው?	o. ኦርቶዶክስ 1.ሙስሊም 3.ፕሮቴስታንት 4. ካቶሊክ 5. ሌላ ካለ
104	ብሄርዎት ምንድን ነው?	0. ኦሮሞ 2. አማራ 3. ትግሬ 4. ጉራጌ 5. ሌላ ካለጥቀስ----------
105	የትምህርት ደረጃ ስንት ነው	1. የመጀመሪያ ደረጃ($\leq$8) 2. ሁለተኛደረጃ(9-12) 3. ኮሌጅ ወይም ዩኒቨርሲቲ
106	በአሁኑ ወቅት የጋብቻዎ ሁኔታ?	1. ያላገባ/ች 2. ያገባ/ች 3. አግብቶ/ታፈታ/ች 4. የትዳርአጋርበሞትያጣ/ች
107	በአሁኑ ወቅት ስራዎ ምንድን ነው?	0. አርሶአደር 1. ነጋዴ 2. የመንግስትሰራተኛ 3. ሌላ ካለ_
108	ወርሃዊ ገቢዎ ምንያህል ነው?	_____ ብር
109	በቋሚነት የሚኖሩበት ቦታ የት ነው?	o. ከተማ 1. ገጠር

ክፍልII.የጥረነገርሁኔታጥያቄዎች (አልኮሆልመጠጥ፤ጫትመቃም፤ሲገራጫስ)

201	በህይወትዎ ጫት ቅመው ያውቃሉ	0. አዎ1. አላውቅም
202	ለጥያቄ 201መልሱ አዎ ከሆነ, ለስንት ዓመት ያህል ቅመዋል? (በወር)	_____ወር

203	ለጥያቄ202 መልሱ አዎ ከሆነ፣ ባለፉት 30 ቀናት ዉስት ቅመዋል?	0. አዎ1. የለም
204	ለጥያቄ 203 መልሱ አዎ ከሆነ፣ ምን ያህል ጊዜ ይቅማሉ?(በየቀኑ, በሳምንት)	------------------
205	ለጥያቄ 203 መልሱ አዎ ከሆነ፣ በቀን ምን ያህልመጠን ጫት ይቅማሉ ?	_____ግራም
206	በህይወትዎ አልኮል ያለበት መጠጥ ጠጥተው ያውቃሉ?	0. አዎ1. አላውቅም
207	ለጥያቄ 206 መልሱ አዎ ከሆነ፣ ለስንት ጊዜ አልኮል ተጠቅመዋል?	0. 6 ወር 1. 1 ዓመት 2. 2ዓመት 3. > 2 ዓመት
208	ለጥያቄ 206 መልሱ አዎ ከሆነ፣ባለፉት 30 ቀናት አልኮል ተጠቅመዋል?	0. አዎ 1.የለም
209	ለጥያቄ 208 መልሱ አዎ ከሆነ፣ምን አይነት አልኮል ተጠቀሙ? (ጥቀስ)	_____
210	ለጥያቄ 208 መልሱ አዎ ከሆነ፣ ምን ያህል አልኮል በሳምንት ይጠቀማሉ?	_____ሊ.
211	በሂዎትዎ ሲጋራ አጭሰው ያውቃሉ?	0. አዎ1. አለውቅም
212	ለጥያቄ 211 መልሱ አዎ ከሆነ፣ በለፉተ 30 ቀናት አጭሰዋል?	0. አዎ 1.የለም
213	ለጥያቄ 212 መልሱ አዎ ከሆነ፣በቀን ምን የህል ሲጋራ ያጨሳሉ ?	_____

ክፍል III- የአካልምርመራ (ልኬት)

301.	የሰውነትክብደትተጠሚ:		302.	የደም ግፊት ልኬት		ሲስቶሊክ ------ ሚ.ሜ. ሜርኩሪ
	ክብደት_____ኪ..ግ ቁመት_____ሜ			(አመች የሆንውንክንድተተቀም)		ዲየስቶሊክ_____ሚ.ሜ. ሜርኩሪ

መመሪያ 2: የሚከተሉት ጥያቄዎች ባለፈው ወር ከተለመደው የእንቅልፍ ወቅት ልማድ ጋር የተያያዙ ብቻ ናቸው። የእርስዎ መልስ ባለፈው ወር ውስት ቀና ሌሊት መካከል አብዛኞቹ በጣም ትክከለኛ መልስ የሚጠቁም መሆን ይኖርበታል። ሁሉንም ጥያቄዎች መልስ ይስጡ።

1.አብዛኛውን ጊዜ ወደ መኝታዎ የምሄዱት መቺ ነዉ? _____

2.በእያንዳንዱ ሌሊት ለመተኛት ምን ያህል ደቅቃዎች ይወስድብዎታል? _____

3.ጠዋት ጠዋት በምን ሰዓት ይነቃሉ? _____

4. ማታ ላይ ምን ያህል ሰዓት ትክከለኛ እንቅልፍ ይተኛሉ? _____

 (ይህ አልጋ ላይ በሰዓታት ከሚያሳልፉት የተለየ ሊሆን ይችላል)

ባለፈው ወር ዉስጥ ስንት ጊዜ የእንቅልፍ ችግር አጋጥሞታል	ባለፈው ወር ምንም አላጋጠማኝም (0)	በሳምንት ከአንድ ጊዜ ያነሰ (1)	በሳምንት አንድ ጊዜ ወይም ሁለትጊዜ	በሳምንት ሦስትና ከዚያ በላይ (3)

			(2)	
ሀ. በ 30 ደቂቃ ውስጥ መተኛት አለመቻል				
ለ. ሌሊት ወይም ማለዳ ላይ ከእንቅልፍ መንቃት				
ሐ. መጸዳጃ ቤት ለመጠቀም መነሳት				
መ. በአግባቡ መተንፈስ አለመቻል				
ሰ. ማንኮራፋት ወይም ማሳል				
ረ. ከፍተኛ ቅዝቃዜ መሰማት				
ሸ. ከፍተኛ ሙቀት መሰማት				
ቀ. መቃዠት				
በ. ሕመም መሰማት				
ተ ሌሎች ምክንያቶች ካሉት፤ እባክዎን ስንት ግዜ በዚህ ምክያት እንደተቸገሩ ጨምሮ ያብራሩ				
ቸ. ባለፈው ወር ምን ያህልጊዜ				

ለእንቅልፍ ብለው መድኃኒት ወስደዋል;(የታዘዘ /የተገዛ)				
ከ. ባለፈው ወር,መኪና ስትነዳ ወይም ምግብ ሰትበላ, ወይም ማህበራዊ እንቅስቃሴ ስታደርግ እንቅልፍ እንቅልፍ የምል ስሜት ተሰምቶህ ነበር?				
ወ. ባለፈው ወር ሥራዎችህን በምን አይነት ስሜት ሥታከናውን ነበር				
	እጅግ በጣምጥሩ (0)	በአንጻራዊ ሁኔታ ጥሩ (1)	በአግባቡ መጥፎ (2)	በጣም መጥፎ (3)
ባለፈው ወር እንቅልፍ ጥራት ደረጃ ምን ያህል ደረጃ ትሠጠዋለህ				

Insomina severity index
መመሪያ 3 ለእያንዳንዱ ጥያቄ ትክከለኛ ምላሽ ስጥ/ጭ

የእንቅልፍ ማጣት ችግር	ምንም ችግር አልነበረም	ዉስን ችግሮች ነበሩ	መጠነኛ ችግር ነበር	ከፍተኛ ችግር ነበር	በጣም ከፍተኛ ችግር ነበር
1.እንቅልፍ መተኛት አለመቻል	0	1	2	3	4

ችግር					
2.እንቅልፍ ተኝተዉ መቆየት አለመቻል	0	1	2	3	4
3.ያለጊዜ የመንቃት ችግር	0	1	2	3	4

4. በአሁኑ የእንቅልፍ ሁኔታዎ ምን አመለካከት አለዎት?

በጣም ረክቻለሁ   ረክቻለሁ   በመጠኑረክቻለሁ   አልረካሁም   ምንም አልረካሁም

    0   1   2   3   4

1. የእርስዎ የእንቅልፍ ችግር ሌሎች የሕይወትዎን ጥራት በማያሰናክል አንጻር ምንያህል ጎልቶ ይታያል ብለው ያስባሉ?

በፍጹም አልታወቀም; በመጠኑ ታዉቆኛል   በመካከለኛዉ ታዉቆኛል   በጣም ታዉቆኛል   እጅግ በጣም ታዉቆኛል

    0   1   2   3   4

6   የአሁኑ የእቅልፍዎ ችግር/ሁኔታ ምንያህል ያሳስብዎታል /ያስጨንቅዎታል?

   በፍጹም አያስጨንቀኝም፣ ጥቂት ,በመጠኑ, ብዙ,   በጣም ብዙ

    0   1   2   3   4

7   አሁን ያለብዎት የእንቅልፍ ችግር ምን ያህል የእርስዎን ዕለታዊ ተግባር ላይ ተፅህኖ አደረገል (ለምሳሌ በቀን ድካም, የስሜት, ችሎታ, , ሥራ / የዕለት ሥራዎ, ትኩረት, ትውስታ ወዘተ...)?

   በፍጹም አይደለም;   ጥቂት ,   በመጠኑ,   በጣም   እጅግ በጣም

    0   1   2   3   4

የውጤት / ትርጓሜ መመሪያዎች:

የስባቱ ነጥቦች ድምር ያክሉ (ጥያቄዎች 1 + 2 + 3 + 4 + 5 +6 + 7) = _____ ጠቅላላ ውጤት

ጠቅላላ ነጥብ ምድቦች:

0-7 = ምንም የእቅልፍ ችግር የለበትም

8-14 የእንቅልፍ ችግር አዝማምያ ያለበት

15-21 = መካከለኛ የእንቅልፍ ማጣት ችግር

22-28 ከፍተኛ የእንቅልፍ ማጣት ችግር

Declaration

I, the undersigned, declare that this thesis is my original work, has not been presented for a degree in this or any other university and that all sources of materials used for the thesis have been fully acknowledged.

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This thesis has been submitted for examination with my approval as University advisor

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