

The Relationship between Quality of Sleep and Geographical Directions during Sleeping Process

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ABSTRACT

Objectives: Sleep has been one of God's most precious blessings since human's existence and it is vital for both body and soul. External and internal factors like age, sex, drug, illness, psychological pressure, job, life style and Earth's magnetic field influence quality of sleep drastically. In this study we tended to find the relationship between geographical direction during sleeping process and quality of sleep.

Methods: In a cross-sectional descriptive study, 200 students from university of Iran, Mazandaran province were selected arbitrarily. After exclusion, based on exclusion criteria, the number of research's samples reached to 153. Tools used regarding collecting data were standard Pittsburg sleep quality inventory (PSQI) in order to assess the quality of the sleep. Symptom Checklist-90-Revised (SCL- 90-R) was used in order to study psychiatric symptoms and an anonymous demographic questionnaire was used to record personal information, filled by individuals. Software Spss17 with chi-square were used for statistical analysis procedure.

Results: 30.7%(47cases) slept in north-south direction, 22.8%(35) in south north, 26.2%(40) in east west and 20.3%(31) in west east. Among PSQI sleep scales, there was a strong relationship between difficulties in falling asleep with geographical directions of sleep ($p < 0.001$). No significant relationship between sleep directions and other scales has been found.

Conclusion: Considering the high prevalence of sleep difficulties and strong relationship between geographical directions and quality of sleep. With respect to this study, sleep in north-south position can be advised to improve sleep quality and it necessary in order to maintain sleep hygiene.

Keywords: *Geographical sleep directions - PSQI- Quality of sleep*

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As long as human existence, sleep and the nature of its intriguing process has been a mystery. The duration and quality of sleep is under the influence of external and internal factors like age, sex, drugs, disease, physical, psychological and social factors. There are some other factors like job, life events and earth's magnetic field, which can affect sleep quality and its recurrence (1).

Although sleep appears to be a passive and restful time, it actually involves a highly active and well-scripted interplay of brain circuits, resulting in sleep's various stages.

(2) Sleep deprivation may affect cognition, behavior and speech. (3). Sleep disturbance may be part of many psychiatric disorders (4). Hormonal changes during menstrual cycle, pregnancy and menopause can be influential on sleeping process (5). Drop of sleep is one of the most prevalent complaints (6). Dysomnias are disturbing phenomenon arising in 3rd and 4th stages of sleep (7). Earth's magnetic field is one of the environmental reasons, which affect sleeping quality (8). Sometimes migration of some species of birds and animals completely depends on the earth's magnetic field (9). Interactions between sunlight and earth's magnetic field may be also effective (10). The effect of the magnetic field on REM Latency has been widely studied (11). There are only few studies about earth's magnetic field and the quality of sleep in the academic literatures. That's why this study is considered to be one of the few studies that had been conducted in this area. The question that we intended to answer was as follow: Is there any relationship between sleep quality and geographical directions during sleep?

MATERIALS AND METHODS

In this cross-sectional descriptive study, 200 undergraduate students in Iran, Mazandaran province were selected randomly in order to determine the relationship between geographical directions during sleep and sleep quality. After exclusion, based on exclusion criteria, the number of research's samples reached to 153. Exclusion criteria of cases were those who during previous month of the study: experienced major physical disorder, consumption of sleeping/Psychiatrics drugs, OTC (over the counter) drugs, pregnant or breast-feeder and had no diagnosed psychiatric disorder and the diagnosis of former group was based on scale of Symptoms Checklist-90-Revised (SCL-90-R). Psychological pressures caused by the exam as confounding variable excluded by doing the study in the non-exam season. Pittsburg sleep quality inventory (PSQI) and SCL- 90- R and also an anonymous questionnaire for demographic information were given to examinees and themselves completed them after explanation about the research process and obtaining an informed consent. Those who participated in this study did not have major change in their living location and geographical direction of sleep previous month of the study. The direction was head to foot. If someone's head was toward north and his feet toward south, it was considered to be North-South and so on. Sub groups were categorized with regard to the closeness to one of the main direction. PSQI assesses the attitude toward quality of sleep, included the time when individuals tend to go to bed, awakening time, drop off, the duration of a good sleep, general self description of sleep and the amount of daily drowsiness (12) . In Iran, Tehran psychiatry institute assessed the validity and reliability of the Farsi version of this questionnaire with 89.6% for sensitivity and 86.5% for specificity (13). The sum of the

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grades have been 0-21 and cutting point was 5, means higher scores shows bad quality of sleep (14).

SCL- 90-R includes 90 questions for psychiatric symptoms assessment. Introduced by lipman and cuvay in 1973, it has scales in the field of physical complaints, obsession-compulsion, mutual relations, depression, anxiety, aggression, phobia, paranoia and psychosis (15). In Iran, Noorbala, Yazdi and his colleagues examined and confirmed the validity and reliability of SCL-90-R (16). Data assessed by X^2 test and analyzed by using SPSS16 software and ANOVA methods.

RESULTS

According to demographic questionnaire and based on exclusion criteria to remove some confounding variables, those who experienced prominent physical disorder (14 samples), hypnotic or psychiatric drug consumption (16 samples), over the counter drug consumption (10 samples), pregnant or breast-feeder were excluded. All samples were chosen from undergraduate students in order to remove job as confounding factor. Total average of age was 22.9 ± 1.1 , the average age of females 22.3 ± 1.4 years, the average age of males $23.1 \pm 1/2$ years. No significant age difference was found ($P > 0.05$). The distribution of geographical direction during sleep and the comparison according to subscales of PSQI is shown in tables 1-8. Except “difficulty falling sleep” no significant relationship between geographical directions with other scales observed.

Table No 1: Geographical direction of sleep

Direction	Number	Percent
N-S†	47	30.7
S-N‡	35	22/8
E-W§	40	26/2
W-E	31	20/3
Total	153	100

† North-south, ‡ South-north, § East-west, || West-east

Table No 2: Comparison the time to go bed scale with geographical direction

Direction	Night. 9-10		Night .11-12		Night .1-2		Night after 2	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
N-S	5	10/6	29	61/7	7	14/9	6	12/8
S-N	5	14/2	18	51/4	6	17/2	6	17/2
E-W	6	15	13	32/5	10	25	11	27/5
W-E	3	9/7	9	29	9	29	10	32/3
Total	19	(12.42)	69(45.10 %)		32(20.92 %)		33(21.57 %)	

$P > 0/05$ $X^2=14.88$

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Table No 3: Comparison the length of time to sleep scale with geographical direction

Direction	10-15 Min		15-30 Min		30-60 Min		More than 1 hour	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
N-S	29	61/7	12	25/5	3	6/4	3	6/4
S-N	20	57/2	9	25/7	4	11/4	2	5/7
E-W	20	50	8	20	6	15	6	15
W-E	16	51/6	8	25/8	4	12/9	3	9/7
Total	85(55.56%)		37(24.18%)		17(11.11%)		14(9.15%)	

P> 0/05 X²=4.9

Table No 4: Comparison the awakening time with geographical direction

Direction	Morning 5-6		Morning 6-7		Morning 7-8		Morning 9-10	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
N-S	5	10/5	12	25/5	23	49	7	15
S-N	7	20	8	22/8	15	42/8	5	14/4
E-W	4	10	8	20	16	40	12	30
W-E	5	16/2	8	25/8	10	32/2	8	28/8
Total	22(17.38%)		36(23.53%)		64(41.83%)		32(20.92%)	

P> 0/05 X²=6.93

Table No 5: Comparison the real night sleep with geographical direction

Direction	4-5 hours		5-6 hours		6-7 hours		More than 7 hours	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
N-S	3	6/4	13	27/6	28	59/6	3	6/4
S-N	3	8/6	15	42/8	12	34/3	5	14/3
E-W	5	12/5	16	40	15	37/5	4	10
W-E	5	16/1	12	38/7	12	38/7	2	6/5
Total	16(10.46%)		56(36.6%)		67(43.79%)		14(9.15%)	

P> 0/05 X²=9.09

Table No 6: Comparison the difficulty falling asleep with geographical direction

Direction	0=None		1=< 1/week		2=1-2/week		3=>3/week	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
N-S	5	10/6	24	51/1	14	29/8	4	8/5
S-N	11	31/5	13	37	7	20	4	11/5
E-W	9	22/5	10	25	10	25	11	27/5
W-E	7	22/6	7	22/6	8	25/8	9	29
Total	32(20.92%)		54(35.29%)		39(25.49%)		28(18.3%)	

P < 0.001 X²= 16.92 d.f =9

Table No 7: comparison the quality of sleep with geographical direction

Direction	Very good=0		Fairly good=1		Fairly bad=2		Very bad=3	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
N-S	15	32	17	36/1	10	21/3	5	10/6
S-N	12	34/3	12	34/3	6	17/1	5	14/3
E-W	11	27/5	8	20	10	25	11	27/5
W-E	9	29	5	16/1	6	19/4	11	35/5
Total	47(30.72%)		42(27.45%)		32(20.92%)		32(20.92%)	

$P > 0.05$ $X^2=12.1$

Table No 8: comparison the daytime drowsiness with geographical direction

Direction	0=None		1=< 1/week		2=1-2/week		3= >3/week	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
N-S	12	25/5	22	48/8	9	19/2	4	8/5
S-N	9	25/7	17	48/6	6	17/1	3	8/6
E-W	9	22/5	18	45	10	25	3	7/5
W-E	10	32/3	12	38/7	6	19/3	3	9/7
Total	40(26.14%)		69(45.1%)		31(20.26%)		13(8.5%)	

$P > 0.05$ $X^2=1.76$

CONCLUSION

In order to study the impact of the geographical directions during sleep on the quality of sleep we conducted this study. There was significant relationship between difficulty of falling asleep and geographical direction ($p < 0.001$), in the north-south sleep direction, the least sleep difficulty existed, and in the west- east the most. Similar studies in the area of the effect of the earth's magnetic field on the quality of sleep has not been done, so comparing the results of this study with other researches is not possible. Studies that can be somehow compared to the present study are: Study of Torbjorn and his colleagues and also Tworoger, creating artificial magnetic field, which had no effect on the structure of sleep (15-16). In this study Earth's magnetic field has been effective. Mesquita evaluated the role of stressor on the quality of sleep and concluded that stressors can make Sleep disorder (17). The present study has been conducted out of exams season in order to remove psychological pressure and according to SCL- 90-R, samples who were suffering from anxiety excluded. Chen and also James showed that the level of education could impact on sleep difficulty (18-19). Almost a similar study in this field has been done by Falarigna(222). In our study all the participants were university students, therefore education as a

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potential interfering factor was removed. Broun studied; type of job on the quality of sleep is important factor (23). In present study, all the participants were students (as a job) so, job's role as an agent excluded, (all courses were full- time) Physical disorder, as an important factor in creating disturbance in quantity and quality of sleep showed by Mc Namara (24). In this study, those had physical problems in recent month were excluded, so we can eliminate this factor. This point worth mentioning again, an exact similar research to this study has not been in the literature so we tried to compare almost similar researches and to remove the confounding variables as much as possible to survey real impact of geographical direction on the quality of sleeping process. Eventually based on the results of this study, sleep in north-south direction, means nearly to the earth's magnetic field direction, is the cause of better quality and less problem of sleep, so it can be recommended to add to sleep hygiene points.

Declaration of interest: None

AUTHORS' CONTRIBUTION:

SMM conceived and designed the study. MA and MBM participated in designing the evaluation, collecting data, performing the statistical analysis and revised the manuscript. JS re-evaluated the data and revised the manuscript. All authors read and approved the final manuscript.

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