



PRESENT TREND IN EVENINGNESS AMONGST MEDICAL STUDENTS IN THE EAST

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ABSTRACT... Objectives: To analyze individual preference in organizing their behavior within 24 hours (Human chronotypes) also referred to as morningness/ eveningness. **Setting:** Dow Medical College, Dow university of Health Sciences Karachi. **Period:** From September 2012 to December 2013. **Study Design:** Cross-sectional. **Methods:** Subjects (Medical students) from first semester to final semester were invited to participate in this study, A total of 710 subjects were included. Their demographic data such as age, gender was obtained. Instrument is an integrated questionnaire (Horne JA and Ostberg O Morningness- Eveningness questionnaire MEQ original 1976) designed to assess chronotype of young adult population. **Results:** Out of different existing chronotypes, biggest group which dominated the current study was intermediate type. **Conclusions:** Present study determined, chronotype of young population (medical students) of this region. The assessment of individual chronotype is important not only for the diagnosis and treatment of sleep disorders, additionally to evaluate ability to adapt for specific work schedule.

Key words: Morningness eveningness, Circadian rhythm, Chronotype, diurnal preference, Biological clock.

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INTRODUCTION

The primary need on evolution of human behavior is the need to explore resources which necessitate time perception. To avail these resources, when supplies are available at around constant time of the day a time keeping system may be required to adapt behavior to daily availability of resources this is the model behind certain studies^{1,2}. Subsequently this concept progressed and the role of fundamental oscillator Supra chiasmatic nucleus (SCN) in the mammalian circadian rhythm system with multiple signals working internally and externally that maintain the circadian of sleep wakefulness broadened^{3,4,5}. Owing to rotation of earth around its own orbit, time keeping system of the body is exposed to daily changes in light intensity. Sleep wake rhythm city in the human body is controlled by a complex interplay of endogenous clocks regulating the transition between dark/light cycle. Human display wide inter individual difference in

organizing their daily activities within 24 hours / day, this is appreciated in their preferred timing of sleep and wake fullness. SCN which institute internal biologic clock located above the crossing of optic nerve, not only modulate daily rhythm of sleep wake cycle but also the rhythm of core body temperature and secretion of certain hormones such as melatonin, cortisol^{6,7}. This along with a sleep homeostasis placed exterior to the human body, Zeitgeber ,which include natural lighting ,exercise and social contacts maintain daily sleep wake cycle^{8,9}. The retinal output is transduced to SCN where they synchronized daily biological rhythm generated by SCN to exactly 24hours through its output signals. The SCN coordinate with all the cellular circadian clocks just as circadian expression of ion channels, throughout the body's tissue. An individual preference in rhythmic design of time keeping that is potentially significant to understanding is the degree to which individual prefer organizing their activities

closer to the morning or evening. Based on diurnal preference or morningness eveningness people can be divided in to chronotype i.e lark and owls with demonstrated difference in sleep wake pattern^{10,11}.

Dynamic of sleep homeostasis always remained focus of attention for researchers, most of these studies based on this observations were conducted in western countries. We speculate that might have been influenced by the cultural differences and acceptability, therefore generalizing previous finding to east might not be appropriate.

The aim of this study was to address individual difference in circadian phase preference of this region and identify the chronotype of young population.

MATERIAL AND METHODS

It was a cross sectional study which was carried out at Dow Medical College from September 2012 to December 2013. It took us four months to analyze the data. The study was approved by the institutional review board of Dow University of Health Sciences Karachi. Participants included were healthy medical students from first semester to final semester with clear Health examination labs which is mandatory for admission in to this university. Data was collected from all those subjects who were willing and fit to participate. Their demographic information including age, gender, was documented. Out of 1000, a random sample of 710 voluntarily consented to participate in the study, written and informed consent was obtained. Screening tool has a set of scale based on scoring criteria. The measuring scale having a range from 16 to 86. Where high ratings signify morningness, low rating suggest an evening preference (Original Horne JA and Ostberg O criteria). Participants were asked to completely fill Morning Evening questionnaire (MEQ). This MEQ was initially given to a sample of 20 students to assess the data gathering process. This questionnaire is still the most widely used tool to diagnose circadian typology of young population between 18-32 years of age¹². This questionnaire included 19 items reflecting the habitual rising and

bed times, preferred times of physical and mental performance and subjective alertness after rising and before going to sleep. The questionnaire was distributed in the class room in the presence of investigator with the help of teachers. Participants with any active disease or any kind of addiction were asked not to fill the questionnaire. A brief introduction of the questionnaire and explanation was provided.

(Horne JA and Ostberg O Scoring criteria:)

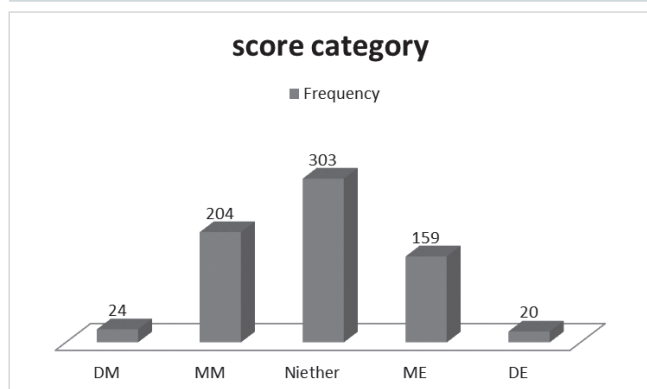
- Definitely Morning Type 70-86
- Moderately morning Type 59-69
- Neither Type 42-58
- Moderately Evening Type 31-41
- Definitely Evening Type 16-30

RESULTS

All data analysis was carried out on statistical Package for social science (SPSS V 20) for windows. Quantitative variable were presented by their mean \pm SD values, however, the qualitative variables were presented by frequency and percentages. A total of 710 completely filled questionnaires were returned. Response rate was 71.0%. Most of the subjects in the current study were females. There were 608 (85.63%) females and 102 (14.37%) males. The mean age was 20.08 ± 1.933 . Table-I. Present the numbers and percentage of different chronotypes evidenced in this study. Prevalence of eveningness was not observed in this study instead the biggest group was the intermediate chronotype. Figure 1. depict the prevalence of different chronotypes. Present study demonstrated 179 (25.2%) evening chronotype which included both moderately plus definitely evening type individuals. Morning chronotype that comprised both moderately morning and definitely morning type were 228 (32.1%), however, largest group was intermediate or neither type 303 (42.7%) and the next large group of this study was morning type. The distribution of MEQ score was ranging from minimum 22 and maximum 87, Mean 51.39 ± 10.40 SD, median was 52. Interquartile range was 15 and mode was 56.

Score Category		
	Frequency	Percent%
DM	24	3.4
MM	204	28.7
Intermediate	303	42.7
ME	159	22.4
DE	20	2.8
Total	710	100

DM (definitely morning) MM (Moderately Morning)
ME (Moderately evening) DE (Definitely Evening)



DISCUSSION

It was observed that our results were supporting intermediate chronotype amongst young adults in the present study, which has emerged as the largest group in the current study. Compare to the earlier studies conducted in the west which documented an increase eveningness in young population of college students.^{13,14,15} The next large group of this study was morning type which has made a difference in this study as compare to the studies mostly conducted in the western world. Present result was similar to another research from Middle East where no particular trend was observed in university students rather intermediate typology “neither type” was evidenced. Geographical location of the region, studied in that particular research was seemingly that the individuals were exposed to intense light in that area¹⁶. Emerging knowledge of sleep system in studies from different parts of the world have increased the awareness of the prevalence of sleep disorders and its management with different techniques, one of which is bright light therapy. Bright light therapy has now become a successful approach to realign the circadian

phase, because age is predictor of many sleep wake parameters, childhood sleep issues such as bed time resistance delayed sleep latency, get up time are often seen but little is known about the distribution of chronotype in prepubertal children (jenni et al 2005, Owens 2007). Human body simultaneously is under the influence of three clocks, two are related to solar and biological cycle, and the third clock is related to social time. Biological cycle which is the product of an endogenous rhythm within the body. Time zones were invented to adjust the constant changing solar time, but they are only estimation as a result sun rises and sets at variable social times within each time zone for instance this divergence exist in China where one sixth of the Earths circumference stays on Peking time officially. This difference in solar and social time is widened in western china to an extent that the individual do not set their routine according to official time¹⁷. Proximate studies in the west demonstrated morning preference in the older population however it was evidenced that amount of time these subjects spent in various light exposure threshold levels was different ,analysis revealed that the older subjects spent a significantly greater amount of their waking day in light, and they were of the opinion that the differences in natural light exposure contributed to the age related phase advance of the circadian pacemaker and its later timing relative to the sleep-wake cycle¹⁸. Though the Genetic approach had provided a different window and supported circadian consistency and preference was rooted in human DNA.¹⁹ Light and temperature signals entrain the clock mechanism to set the circadian phase, which describes the timing of endogenous rhythms relative to the environmental cycle (Bell-Pedersen et al, 2005), based on available experimental data, detailed computerized models has been considered for circadian rhythm in Drosophila different models showed how regulatory feedback loops in the circadian genetic network cooperate to produce sustained oscillation in continuous darkness.²⁰Incorporating the effect of light in to these model account for phase shift induced by light pulses for the entrainment of the circadian clock.

CONCLUSIONS

Studies are desired to ascertain the chronotypes of young population in diverse geographical meridian to assess regional topographic specificity. The evaluation of individual chronotype is important for the diagnosis and treatment of sleep disorders.

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“Fools are without number.”

Desiderius Erasmus



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