ANTECEDENTS INFLUENCING QUALITY OF SLEEP AMIDST MANAGEMENT STUDENTS

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Abstract

Quality sleep is predominantly considered as a significant aspect of our day today activity. Management students are constantly buffeted with challenging tasks as a part of their ongoing pedagogy. Often there are instances wherein the sleep is distorted due to few unprecedented activities. The research work makes an attempt, through in-depth review of literature in understanding the various antecedents that can to be considered as disturbance for quality of sleep. The internal consistency of the questionnaire is assessed through test of reliability. Hypothesis testing is computed in understanding the differences of opinion if any through parametric tests. The dimensions are framed using exploratory and confirmatory factor analysis. The attributes are collapsed into six different constructs through dimension reduction technique using R Programming. The influence of the independent attributes on the aspect of obstructive sleep is assessed through multivariate regression analysis (Structural Equation Model) using AMOS. Off all the antecedents the attributes confining the dimension of lifestyle and health are identified to be of high relevance. The stance is further substantiated through formulation of decision tree model.

Keywords: Obstructive Sleep, Health Issues, Habits, Sleep Environment, Relationship Issues, Lifestyle, App Usage, Obstructive Sleep.

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DOI: - 10.53555/ecb/2024.13.01.30

Introduction

In recent past it has been a statement heard from the student fraternity, stating they are stifling with poor quality sleep. This ignites a thought to make an empirical study in understanding the key elements that can influence the aspect of quality of sleep. Quality sleep or sleep without obstruction is very essential as it assists the overall development of individuals. It is evident that obstructive sleep leads to several impediments amidst humans leading to multiple distress (Kim et al., 2022). Individuals might be buffeted with issues like; difficulty in concentration, memory issues, mood swings, lack of ability in decision making, increased risk of accidents, health issues, increased stress levels, Impaired communication skills, and the likes. The issues evolved from the chronic sleep deprivation can lead to insomnia (Jesudoss et al., 2023). Insomnia is a sleep disorder that is characterized by struggle falling asleep, staying asleep, or both (Bard et al., 2023). Ancient Indian Vedic literature states sleep as the temporary death and further permeant sleep as death, for which humans thank the almighty to make understand the humans about the concept of aham (I, me and mine or ego). In connection to the same sleep is fragmented in four stages wherein jagrat is the waking stage of sleep, svapna is the dreaming stage, followed by the shushupti known as deep sleep and finally the turiya recognized as the highest stage only attained by the yogi (divine human who understands self, better than others (Kumar, 2015).

The relevance of quality sleep, if overlooked can impact into distorting results in long run. Sleep apnea (Hong et al., 2023), sexual dysfunction (Morehouse et al., 2011), suicidal behaviors (Romier et al., 2023), ischemic stroke (Hong et al., 2023), Coronary artery disease (Fujiyoshi et al., 2023), and the likes are some of the severe issues of poor quality sleep.

Obstructive sleep are the outcomes from multiple mis practices. Of late due to the paradigm shift in technological ecosystem, individuals are head winded with electronic devices. Smartphones, laptops, smart televisions and the likes are the items used extensively causing people to sleep for lesser duration of time (Kheirinejad et al., 2022). Moods of humans and their health is influenced by the smart devices and the applications used on the same (Cao & Lin, 2017)(Likamwa et al., n.d.). The eating habits (Tregarthen et al., 2015), work life balance (Daei et al., 2019), sleep environment (Acikgoz et al., 2022), increase in stress levels (Sanusi et al., 2022), imbalance in behaviour (Cho & Lee, 2017), reduction in attention span (Nazime Tuncay, 2016), relationship issues (Ko et al., 2015), depression (Rozgonjuk et al., 2020), anxiety (Yang et al., 2020), time management issues (Maurya et al., 2022), worry than relax (Chen et al., 2022), reduction in physical activities (Dana et al., 2022) and the likes are recently resulting as significant indicators for obstructive sleep resulted from usage of electronic devices.

The average global sleeping duration is less than seven hours and Japan is the country with least sleep duration, being five hours and fifty-five minutes. Indians on an average sleep for six hours and twenty minutes. However, very few countries like Finland, Britain, Netherlands, and New Zealand sleep hours are more than seven hours (Chaput et al., 2018). The sleep duration amidst youth is deteriorating and is associated with multiple development aspect of the nation. For instance, Japan has the least reproduction rate and India has one of the least happiness indexes in the world.

Objective of the Study

1) To identify the various antecedents confining to the aspect of quality sleep amidst management students
2) To find the underlying dimensions that can well explain the nuances of quality sleep amidst management students
3) To formulate a systematic process and identify the vital parameters distorting quality sleep amidst management students

Research Methodology and Data Analysis

The data is collated through structured questionnaire wherein all the attributes are referred through in-depth review of literature. Twenty-nine elements are identified to be part of independent variable and nine as dependent variable. Responses are collected from google forms wherein the respondents for the study are the management students in their third semesters. Through the assistance from management faculties, 418 responses are collected from five management colleges of which four are from Bangalore (St. Claret, NSB Academy, Padmashree College, and ISBR College) and one from West Bengal (MDI – Murshidabad). The average age of the respondents is 23 years and represent 20 states of India. Due the aspect of non-uniformity in their spread, they are classified into four different geographical regions being north, south, east and west India. The data set has no missing values and consists cent percent valid cases. The attributes of independent variables are added to frame a construct (Vital Parameters) and further the antecedents of dependent variable are added to frame another dimension (Obstructive Sleep). The construct being, Vital Parameters follow normal distribution wherein the value of

skewness is identified to be 0.398 and kurtosis as 0.320 - within the permissible limit of +- 1.96 . The questionnaire used is internally consistent as the Cronbach's Alpha is observed to be 0.899 being above the permissible limit of 0.70. To assess the uniformity of responses considering the demographic factors on the attributes of vital parameters, one sample t.test and one way analysis of variance is computed. The hypothesis for the same and the results of the analysis are mentioned below.

Hypothesis to assess the difference in the mean scores

H_{o1}: There is no difference in the mean scores of respondent's gender on the dimension of vital parameters.

H_{a1}: There is difference in the mean scores of respondent's gender on the dimension of vital parameters.

The p value for levene's test for equality of variance is identified to be 0.768, assisting to refer the value for equal variance assumed. The p value for one sample t.test is 0.012, being less than 0.05 level of significance. Further, it can be stated that the dimensions of vital parameters are of different opinion by the respondents considering their gender as independent factor.

H_{o1}: There is no difference in the mean scores of respondent's place of residence on the dimension of vital parameters.

H_{a1}: There is difference in the mean scores of respondent's place of residence on the dimension of vital parameters

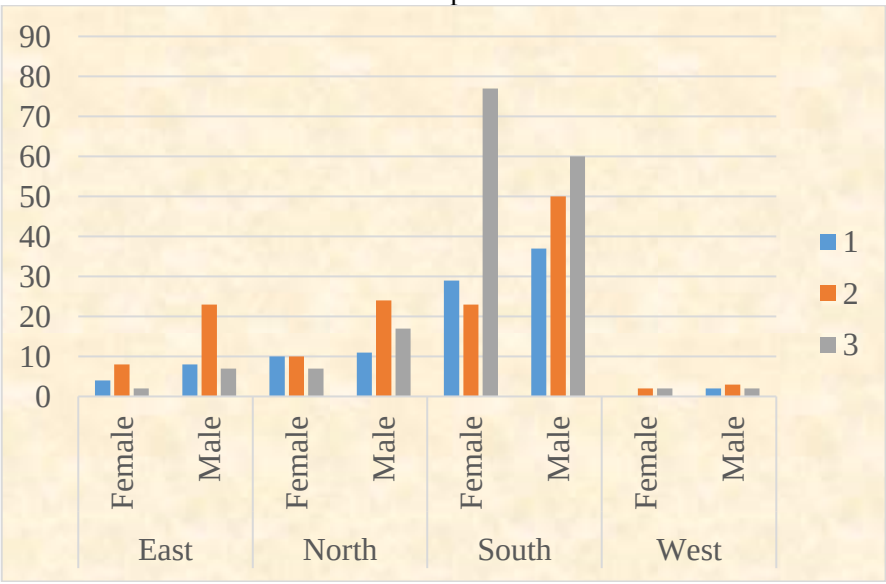
Post hoc test for analysis of variance is computed and in the first instance the p value for levene's test is observed to be 0.057. The value for analysis of variance is considered over Welch test and it is identified that responses vary as per the state of residence on the aspect of vital parameters.

The test for mean differences paves way to compute cluster analysis as it can assist if the opinions are dependent of the respondent's segments.

Table 1: Results of Cluster Analysis

Clusters	1	2	3	4	5	Total
Five	44	157	84	80	53	418
Four	97	116	148	57		418
Three	101	143	174			418
Two	155	263				418

Chart 1: Gender and Respondents in each Cluster

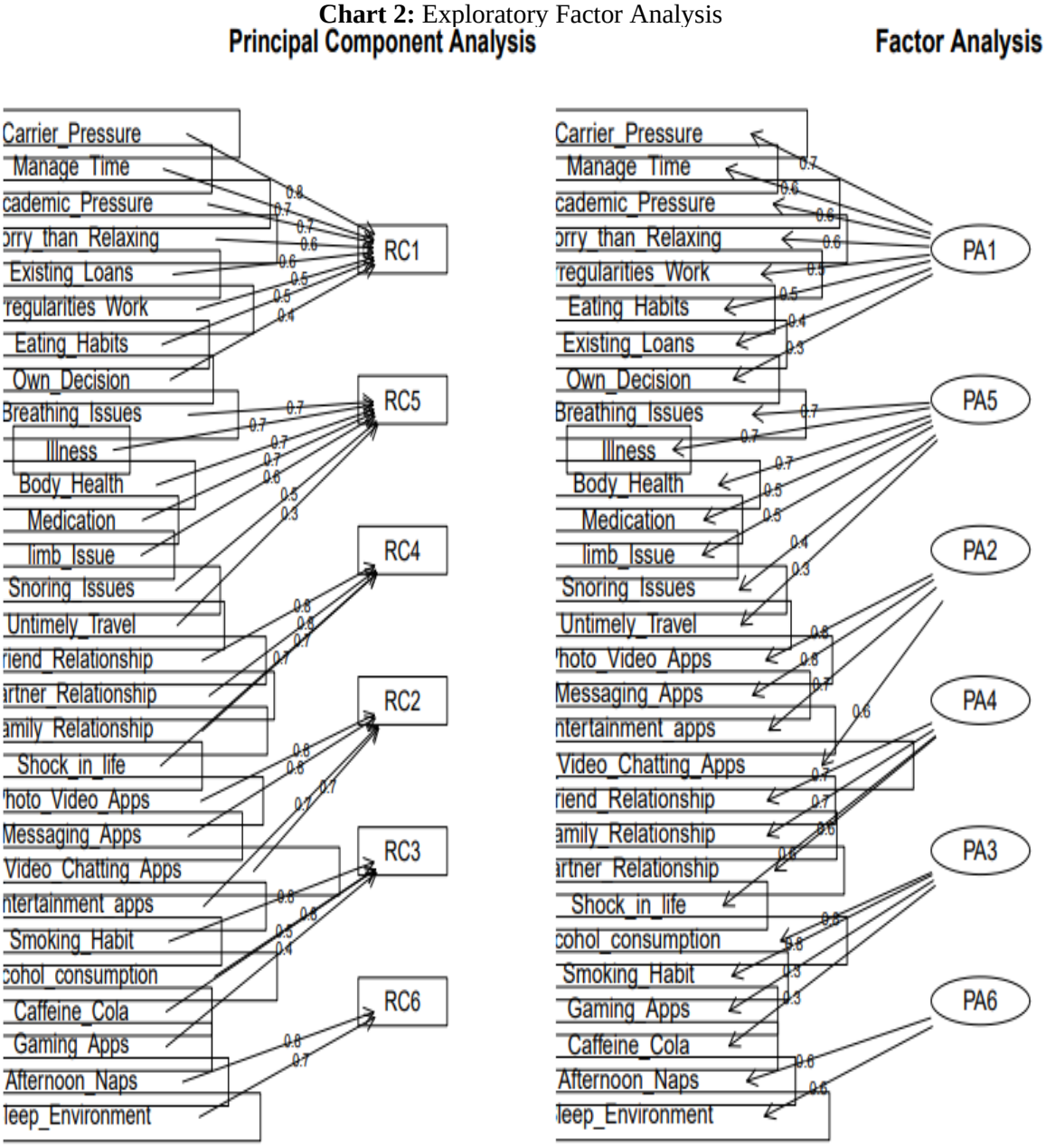


The test of cluster analysis assists optimum number of clusters as three, as it can be observed in the above table wherein the uniformity in respondents is rationally split. The test for hierarchical cluster fails in providing enough evidence as the dendrogram depicts cluttered output. Further the kmeans test assists in providing sufficient evidence backed with silhouette score for assessment. The cluster analysis postulates a pattern wherein the both female respondents from cluster three representing south region are having different outlook on the aspect of vital parameters. Hence, creating non uniformity in the responses. This

paves way in understanding the responses of these respondents to extract more insights.

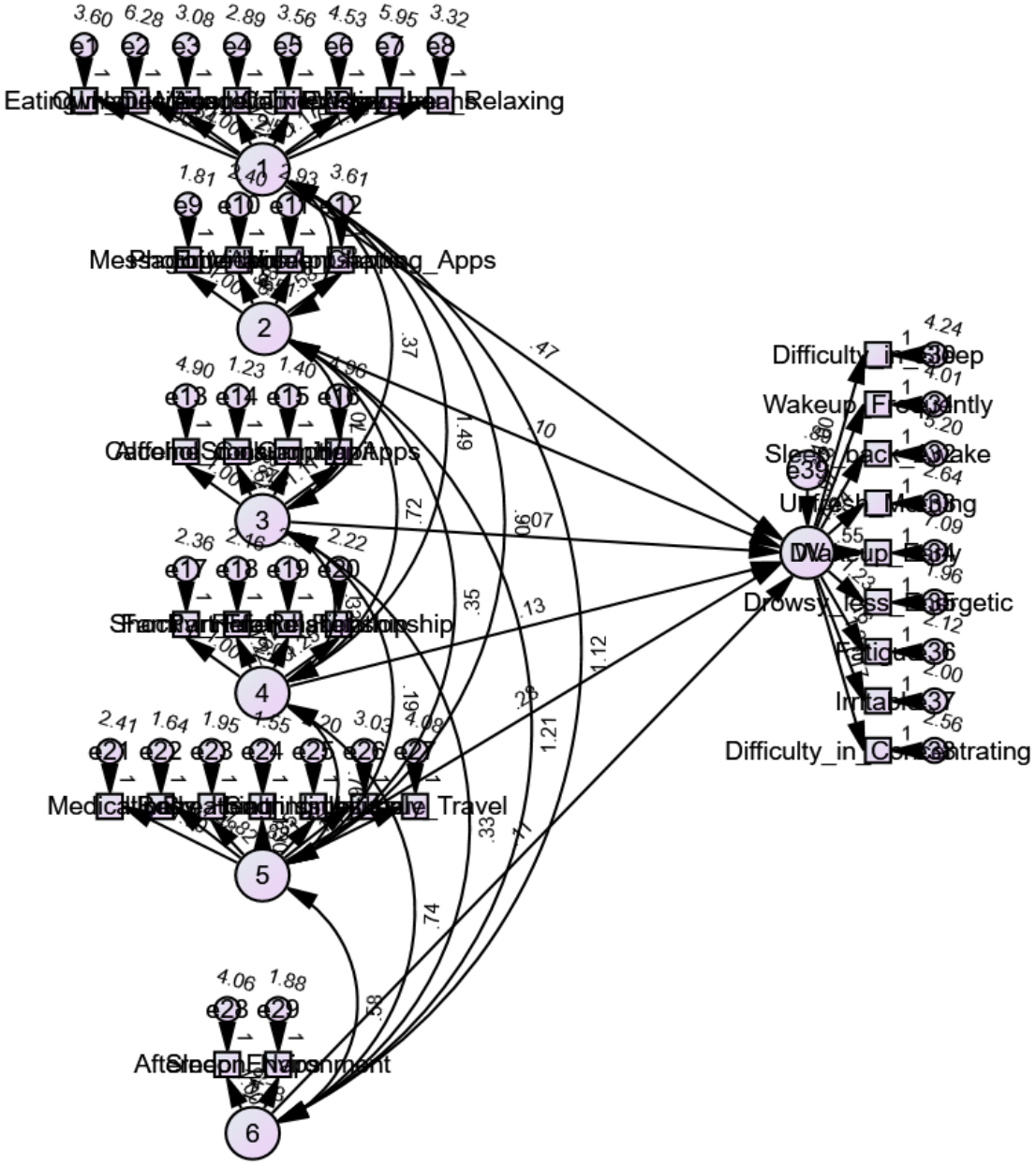
The preliminary analysis prior to formulation of structural equation model is the computation of factor and principal component analysis. The figure below represents the appropriate fit of the attributes in the six dimensions framed. Varimax technique is used as the rotation method and the cutoff for factor loadings is considered to be 0.50.

Chart 2: Exploratory Factor Analysis



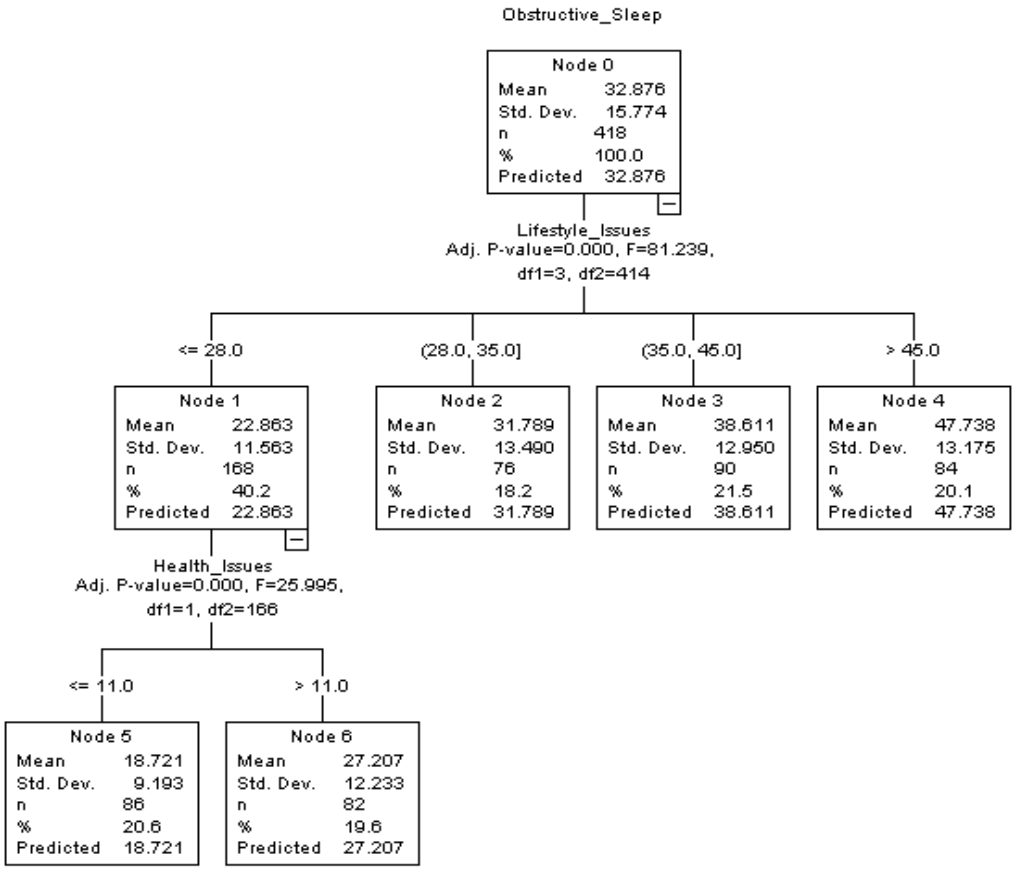
The concern pertaining to multicollinearity is further substituted through confirmatory factor analysis. The key values being CMIN/DF is identified to be 2.749 followed by the RMSEA value as 0.65. All the attributes have significant relationship on their constructs. The model represents appropriate fit, however an attempt was made in removing few items which were high on modification indices. The attributes removal had no much impact on the key indicators, hence retained.

Chart 3: Structural Equation Model



The third (Habits) and sixth (Sleep Environment) dimensions have statistically non-significant relationship on the variable obstructive sleep. Further the value of CMIN/DF is observed to be 2.549 and RMSEA is identified to be 0.60. The other model fit indicators are as follows, Model GFI .833, AGFI .807, PGFI .721, NFI .780, RFI .759, IFI .854, TLI .838, and CFI .853, being satisfactory. The regression weights for the dimensions are, Lifestyle .455, App Usage .092, Relationship .135, and Health .260. Hence, it can be stated that the attributes of lifestyle are of the highest predominance followed by Health, Relationship and App Usage.

Chart 4: Decision Tree Model



The outputs derived from the structural equation model can be further substantiated with the results obtained from decision tree model. The minimum cases in parent node are considered to be hundred followed by cases in child node as fifty. As depicted in the figure above it can be observed that the attributes of lifestyle are the preliminary influencer for obstructive sleep followed by the health issues. However, the second iteration considering the attributes as independent indicators specify the antecedents being worry more than relaxing, irregularities in work and usage of messaging apps as the vital parameters influencing obstructive sleep.

Findings from the Study

- The analysis considering gender on the dimension of vital parameters represent p value more than significance level resulting in acceptance of null hypothesis. Hence it is found that there is difference in the opinions considering gender of the respondents.
- The test for post hoc analysis of variance in regards to the geographical region of the respondents represent difference in the opinion towards the aspect of vital parameters. The analysis further provides scope in investigation of the demographic factors creating differences.
- Cluster analysis using kmeans clustering technique reflects segments of respondents from third cluster representing south region as the cluster responsible for change in the responses. This provides scope in assessing these segments in detail for further insights.
- Dimension reduction technique using factor analysis and principal component analysis, appropriately collapse the antecedents in six constructs. Further the indicators for model fit are satisfactory for confirmatory factor analysis. Hence the aspect of multicollinearity is addressed paving way for multivariate analysis.
- Structural equation model suggests the dimension of lifestyle as key influencing variable followed by the attributes of health. The parameters for lifestyle are eating habits, own decision, irregularities work, manage time, academic pressure, carrier pressure, existing loans, and worry than relaxing. The antecedents for health are medications, illness, body health, breathing issues, snoring issues, limb issue, and untimely travel.
- Decision tree analysis also suggest the similar variables as the key influencing factors. However, the predominant attributes identified are respondents worry than relaxing, usage of messaging apps and irregularities in performance of work. The attribute of lack in

time management is considered to be the driving parameter for the attributes identified.

Suggestions and Conclusion

The study makes an attempt in identifying the vital parameters causing obstructive sleep amidst management students. Empirical evidence suggests the life style parameters as the key influencers and the students need to be handhold by the concerned stake holders. The role of the faculties and the instructional heads becomes crucial in formulating appropriate structure for the students to overcome the issues of obstructive sleep. Guidance in terms of formulating efficient work plans and in time attainment of the same is to be closely monitored. Sizable workshops of managing lifestyle and health are to be cascaded from experts in the domain. The study makes an attempt to contribute concepts to the existing body of knowledge that will assist the society by large in addressing the issue of obstructive sleep.

Bibliography

- Acikgoz, A., Acikgoz, B., & Acikgoz, O. (2022). The effect of internet addiction and smartphone addiction on sleep quality among Turkish adolescents. *PeerJ*, *10*. https://doi.org/10.7717/peerj.12876
- Bard, H. A., O'Driscoll, C., Miller, C. B., Henry, A. L., Cape, J., & Espie, C. A. (2023). Insomnia, depression, and anxiety symptoms interact and individually impact functioning: A network and relative importance analysis in the context of insomnia. *Sleep Medicine*, *101*, 505–514. https://doi.org/10.1016/j.sleep.2022.12.005
- Cao, H., & Lin, M. (2017). Mining smartphone data for app usage prediction and recommendations: A survey. In *Pervasive and Mobile Computing* (Vol. 37, pp. 1–22). Elsevier B.V. https://doi.org/10.1016/j.pmcj.2017.01.007
- Chaput, J. P., Dutil, C., & Sampasa-Kanyinga, H. (2018). Sleeping hours: What is the ideal number and how does age impact this? In *Nature and Science of Sleep* (Vol. 10, pp. 421–430). Dove Medical Press Ltd. https://doi.org/10.2147/NSS.S163071
- Chen, H., Zhang, G., Wang, Z., Feng, S., & Li, H. (2022). The Associations between Daytime Physical Activity, While-in-Bed Smartphone Use, Sleep Delay, and Sleep Quality: A 24-h Investigation among Chinese College Students. *International Journal of Environmental Research and Public Health*, *19*(15). https://doi.org/10.3390/ijerph19159693
- Cho, K. S., & Lee, J. M. (2017). Influence of smartphone addiction proneness of young children on problematic behaviors and emotional intelligence: Mediating self-assessment effects of parents using smartphones. *Computers in Human Behavior*, *66*, 303–311. https://doi.org/10.1016/ j.chb.2016.09.063
- Daei, A., Ashrafi-Rizi, H., & Soleymani, M. R. (2019). Nomophobia and Health Hazards: Smartphone Use and Addiction among University Students. *International Journal of Preventive Medicine*, *10*(1). https://doi.org/10.4103/ijpvm.IJPVM_184_19
- Dana, A., Nodeh, H., Mir, M. ;, Salehian, H., Saei, S. M., & Sarvari, S. (2022). Smartphone Usage Status, Sleep Pattern, Health-Related Quality of Life, and Physical Activity among Adolescents from before to during the COVID-19 Confinement: a Cross-Sectional Study. *International Journal of School Health. Int. J. School. Health*, *9*(1), 1–9. https://doi.org/10.30476/INTJSH. 2021.92822.1178
- Fujiyoshi, K., Tojo, T., Minami, Y., Ishida, K., Ishida, M., Wakabayashi, K. ichiro, Inomata, T., & Ako, J. (2023). Clinical outcomes and plaque characteristics in patients with coronary artery disease and concomitant sleep-disordered breathing treated by continuous positive airway pressure. *Sleep Medicine*, *101*, 543–549. https://doi.org/10.1016/j.sleep.2022.12.014
- Hong, Y., Mo, H., Cho, S. J., & Im, H. J. (2023). Wake-up ischemic stroke associated with short sleep duration and sleep behavior: A stratified analysis according to risk of obstructive sleep apnea. *Sleep Medicine*, *101*, 497–504. https://doi.org/10.1016/j.sleep.2022.11.038
- Jesudoss, D., Rathinasamy Lazarus, E., & Wahid, R. (2023). Insomnia and sleep quality among older people residing in old age homes at Andhra Pradesh, India. *International Journal of Africa Nursing Sciences*, *18*. https://doi.org/10.1016/j.ijans.2022.100522
- Kheirinejad, S., Visuri, A., Ferreira, D., & Hosio, S. (2022). "Leave your smartphone out of bed": quantitative analysis of smartphone use effect on sleep quality. *Personal and Ubiquitous Computing*. https://doi.org/10.1007/s00779-022-01694-w
- Kim, D. H., Kim, S. W., & Hwang, S. H. (2022). Diagnostic value of smartphone in obstructive sleep apnea syndrome: A systematic review and meta-analysis. In *PLoS ONE* (Vol. 17, Issue 5 May). Public Library of Science. https://doi.org/10.1371/journal.pone.0268585
- Ko, M., Choi, S., Yang, S., Lee, J., & Lee, U. (2015). FamiLync: Facilitating participatory

parental mediation of adolescents' smartphone Use. *UbiComp 2015 - Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*, 867–878. https://doi.org/10.1145/2750858.2804283

- Kumar, V. M. (2015). Sleep Medicine in Ancient and Traditional India. *Sleep Medicine*, 25–28. https://doi.org/10.1007/978-1-4939-2089-1_4
- Likamwa, R., Liu, Y., Lane, N. D., & Zhong, L. (n.d.). *Can Your Smartphone Infer Your Mood?*
- Maurya, C., Muhammad, T., Maurya, P., & Dhillon, P. (2022). The association of smartphone screen time with sleep problems among adolescents and young adults: cross-sectional findings from India. *BMC Public Health*, *22*(1). https://doi.org/10.1186/s12889-022-14076-x
- Morehouse, R., MacQueen, G., & Kennedy, S. H. (2011). Barriers to achieving treatment goals: A focus on sleep disturbance and sexual dysfunction. *Journal of Affective Disorders*, *132*(SUPPL. 1). https://doi.org/10.1016/j.jad.2011.03.047
- Nazime Tuncay, A. (2016 Journal of Educational and Instructional Studies in The World 20 Smartphones as Tools for Distance Education. In *Journal of Educational and Instructional Studies in The World* (Issue 6).
- Romier, A., Maruani, J., Lopez-Castroman, J., Palagini, L., Serafini, G., Lejoyeux, M., d'Ortho, M.-P., & Geoffroy, P. A. (2023). Objective sleep markers of suicidal behaviors in patients with psychiatric disorders: A systematic review and meta-analysis. *Sleep Medicine Reviews*, *68*, 101760. https://doi.org/10.1016/j.smrv.2023.101760
- Rozgonjuk, D., Pruunsild, P., Jürimäe, K., Schwarz, R. J., & Aru, J. (2020). Instagram use frequency is associated with problematic smartphone use, but not with depression and anxiety symptom severity. *Mobile Media and Communication*, *8*(3), 400–418. https://doi.org/10.1177/2050157920910190
- Sanusi, S. Y., Al-Batayneh, O. B., Khader, Y. S., & Saddki, N. (2022). The association of smartphone addiction, sleep quality and perceived stress amongst Jordanian dental students. *European Journal of Dental Education*, *26*(1), 76–84. https://doi.org/10.1111/eje.12674
- Tregarthen, J. P., Lock, J., & Darcy, A. M. (2015). Development of a smartphone application for eating disorder self-monitoring. *International Journal of Eating Disorders*, *48*(7), 972–982. https://doi.org/10.1002/eat.22386
- Yang, J., Fu, X., Liao, X., & Li, Y. (2020). Association of problematic smartphone use with poor sleep quality, depression, and anxiety: A systematic review and meta-analysis. In *Psychiatry Research* (Vol. 284). Elsevier Ireland Ltd. https://doi.org/10.1016/j.psychres.2019.112686