The relationship among adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep among university students

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Summary. The cross-sectional correlation quantitative research is about the exploration of the relationship among sleep quality, lucid dreaming skills, and anxiety preoccupation about sleep in Pakistani university students. *Aim*. To measure the adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep among university students. *Method*. The study design used in this research is convenience sampling. A sample of 61 students from which 34% constituted males and 43% were females with age statistics (M=22.2, SD=4.5) from private Pakistani university. Adult Sleep Quality (Fortunato et al., 2008), Lucid Dreaming (Schredl, 2002), and Preoccupation and Anxiety about Sleep (Harvey, 2011) were used for measuring these constructs. *Results*. The findings indicated a moderate correlation of adult sleep quality with lucid dreaming (r=.140 , p<.05), anxiety, and preoccupation with sleep (r=.248, p<.05). The study also indicated that there is no impact of age, income, or gender on adult sleep quality, lucid dreaming, anxiety, and preoccupation about sleep. Hence, no post hoc was estimated. *Conclusion*. There is an insignificant relationship between adult sleep quality, lucid dreaming, anxiety, and preoccupation with sleep. There is a need to research more on sleep studies.

Keywords: Adult sleep quality, lucid dreaming, anxiety, preoccupation about sleep in students

1. Introduction

This is significant to study adult sleep quality, lucid dreaming, anxiety, and preoccupation about sleep in students. Sleep is an important factor for mental, physical, and emotional well-being (Schmickler et al., 2023). Dreaming is important to know more about consciousness. Moreover, in recent times, sleep medication has gained popularity, and the effect of medicines must be investigated in sleep studies. An accurate estimate of the sleep quality of adults, lucid dreaming, and, anxiety and preoccupation about sleep is one of the fundamental requirements for humans that's related to health and also for research activities to attain the goal of improving human working abilities and life satisfaction (Cavanaugh et al., 2023). Sufficient sleep helps brain performance and emotional and physical well-being (Tyni, 2024). Inadequate sleep leads to mood disorders, heightened risk of stroke, obesity in children, and worst-case scenarios, contributing to the onset of dementia. If the brain consistently goes through a proper sleep cycle phase, can aid in creative potential in the mind(Johnson, 2023). Supported by the study that non-rapid eye movement sleep results in restful sleep and improves working memory (Jalan et al., 2023). A good night's sleep improves cognitive function,

helps in alertness, and supports balanced emotions (Christodoulou et al., 2023).

Literatur review

Adult sleep quality

The main aim of the study is to analyze the relationship between the variables i.e., Adult sleep quality, Lucid dreaming, and Anxiety and preoccupation about sleep. Sleep quality affects a person's daily life and how much effect lucid dreaming can have on daily tasks and level of concentration. Adult sleep quality can lead to anxiety and preoccupation about sleep if it induced sleep paralysis, that may be attributed to lucid dreaming, although the phenomenon is under-researched (Ableidinger& Holzinger, 2023). Several demographic factors and lifestyle variables impact sleep quality, lucid dreaming, and sleep anxiety. Factors of age, income, gender, family system, and birth order are integral (Maratia et al., 2023; Tir et al., 2023).

Sleep quality is connected to the cognitive capacity of the brain. As the progression of age, intelligence dysfunction precedes and leads to the decomposition of the external cortex layer, located in the cerebellum (Raz et al., 2015) along with white matter pathology reduction in neurotransmitter receptor binding (Burzynska et al., 2010). There is a functional basis of individual differences associated with an age-associated cognitive impairment like the amount of sleep, the timing of sleep, and the quality of sleep thus this factor is considered to be a potential contribution (Roberts et al., 2009).

Studies using experiments say that sleep restrictions and somnolence are dose-related mental process troubles including recalling, opting for novel ideas, and making proactive and rational decisions in young adults (Ratcliff & Dongen,2009). Several old age people complain the long-lasting

troubles with the transition from wakefulness into sleep, the length of time, and continuance along with severe day disturbance like feeling abnormally sleepy or tired during the day, plummeting, and facing cumbersome situations in everyday life that require social and pragmatic living (Troxel et al., 2009). Younger adults also complain about the lack of sleep which makes them prone to errors, forgetfulness, and clumsy behavior (Fulda & Schulz, 2010). Some previous studies show that the cognitive performance of older adults develops long-lasting sleep disorders (Haimov et al., 2008), but there is little information about how sleep disturbance causes inter-individual differences in mental process tasks in a type of aging-related studies where people of a healthy community participate on their own accord or volunteer (Li et al., 2022). Also, some other studies found out the relationship uniting sleep quality and cognitive abilities or mental processes does not command states like impairment in sleep and cognition.

A study investigated the levels of stress that can affect sleep and psychological resilience using the Johnson Heart Study (Cain-Shields et al., 2020). Stressful life events are inevitable yet the agents involved in social life, including parents, peers, and teachers can help manage an individual's stress levels that interfere with sleep quality (Deng et al., 2020).

According to the decades of study on sleep and work on many people's living habits and sleep habits it is fascinating that how individuals sleep and however or what is going on in the workplace is the initial step of the development (Cheng et al., 2012), at least it is an interesting fact than those of previous studies that are mostly on the topics of wellbeing and tension (Palagini et al., 2013). According to the self-determination theory, present researchers work on how defective stimulation processes at workplaces are related to problems of sleep or sleep disorders and the mental well-being of individuals (Mead et al., 2020). According to the results of the data collected the workers complain about problematic sleep, depression, and anxiety when they suffer from stress from the workplace or any kind of work-related disturbance which are the basic psychological needs (Pilcher & Morris, 2020). Some additional studies reveal that there is an ambiguous result of exchange in psychological needs that change irritation into anxiety not swap it into depression through sleep disorder (Heming et al., 2021).

Lucid dreaming

Mindfulness and lucid dreaming tend to include self-recognizing and consciousness. This means people have knowledge and mindful talks about their incidents (Tzioridou et al., 2022). An evident hypothesis about dreaming tells that the context of dreams is connected to daily life experiences, thoughts, and troubles a little research proves that there is an association between waking mindfulness and lucid dreaming (Geise & Smith, 2023).

Lucid dreams can be defined as dreams in which a person who dreams knows that he/she is dreaming and they can also experience spiritual and mystical experiences in the dream (Stumbrys, 2022). Researchers conducted online research of 471 samples, mainly to discover whether there is an association between spirituality and lucid dreaming that having into a description that part of lucid dream experiences, 95% are those who had experienced lucid dreams and 65% were those who have experienced regular lucid dreams (Rolim et al., 2020)

Lucid dreamers might build a combined condition associating a lucid dream and nightmare (Wong et al., 2022) It is posited that some lucid dreams are the results of nightmares as per the research that included a structural equation model that showed nightmares could predict the frequency of lucid dreaming.

Anxiety and preoccupation with sleep

Usually, university students are considered to be tormented by high stress levels and anxiety which can lead to poor sleep quantity and quality (Dhalla, 2022). There is a technique called the breathing technique that can be considered to be very effective for the chronic stresses that people encounter in everyday life. Nowadays, technology improves the quality of life of individuals with wearables (Oyebode et al., 2021). Apple watches contain an application of mindfulness that encourages its users to stop for a minute in a day and engage in mindfulness through reverberating breathing. This wearable technology is reachable and very accurate in measuring different biometrics such as sleep quality and quantity. The motive of this research is to discover if the mindfulness reminder started by the Apple watch will positively correlate with better sleep quality and quantity. The result shows that mindfulness reminders decrease 1% of restful sleep. One more thing is discovered which is if the participants sleep more, the more rest they experience overall (Germain et al., 2021).

Jansson-Fröjmark and Sunnhed (2020) explored the validated properties of cognitive measures. The first is "the anxiety and preoccupation about sleep" (Tang & Harvey, 2003) and the second is the "sleep-associated monitoring index" (Chan et al., 2012). The two samples were investigated with first cohort of 168 students and the second cohort included 219 patients. The psychometrics include the values of $\alpha = .70$ to 72.The correlations between the original and brief versions were significant at .79 to .82. The two brief versions were also specifically associated with insomnia severity and nighttime symptomatology.

In the student sample, 14.9% reported experiencing insomnia and scored higher on both of the two validated instruments as compared with those who do not experience insomnia and have restful sleep.

Ellis, Hampson and Cropley (2007) explored whether daytime activities mediate the relationship between anxiety and poor sleep for older adults. The correlational cross-sectional and quantitative reported the mediated role of sleep preoccupation with anxiety and associated poor sleep in sample 92. The results also indicated partial mediation between preoccupation with sleep and physical attributions (Tang et al.,2023).

Many different international and indigenous types of research proved that these variables are connected. There are also many different factors which are playing a mediating or moderating role for these variables which affect the results, these can be demographics and other variables. The primary goal of the mentioned study was to find a model in which she/he has tendencies to participate in social comparisons of adult sleep quality and how it affects health (Vgontzas et al., 2013).

Another study suggests that sleep time and sleep quality are correlated and impact life years. Sleep time and sleep quality have the potential to significantly lead to chronic physical problems. The most frequent measure of the Pittsburg Sleep Quality Index is used in studies investigat-

ing medical and psychiatric diagnoses that persist for 12 months or more (Rodriguez-Barragan, 2023). Sleep that is less than 6 hours compared to the metric of 8 hours was associated with chronic fatigue, obsessive-compulsive disorders, generalized anxiety disorder, and confounding mental disorders leading to comorbidities (Campbell et al., 2023). Furthermore, the onset of affective disorders is also linked to sleep duration. Hence, restful sleep is an integral indicator and antecedent related to physiological and psychological health (Zhang et al., 2023).

Aim

The main purposes of this research are as follows:
- To explore the association among Adult sleep quality, Lucid dreaming, anxiety, and preoccupation about sleep.
- To investigate whether Adult sleep quality is a significant predictor of Lucid dreaming and anxiety and preoccupation about sleep.
- To investigate whether Adult sleep quality is a significant predictor of anxiety and preoccupation about sleep.
- To investigate if there are main effects of age, income, and gender on adult sleep quality, lucid dreaming, anxiety, and preoccupation about sleep.

Hypothesis of the Study

- H1. There is a significant relationship between Adult sleep quality, lucid dreaming, anxiety, and preoccupation with sleep.
- H2. Adult sleep quality is a significant predictor of lucid dreaming anxiety and preoccupation about sleep.
- H3. Adult sleep quality is a significant predictor of anxiety and preoccupation about sleep.
- H4. There is an impact of age, income, and gender on adult sleep quality, lucid dreaming, anxiety, and preoccupation about sleep.

2. Method

2.1. Research Design

It is a quantitative correlational cross-sectional research design. The quantitative research method was used to explore the connection and relationship between adult sleep quality, lucid dreaming, anxiety, and preoccupation with sleep. A population sample of 61 university students which include young males (n=30) and young females (n=31) from the university. A convenient sampling strategy was used in the research. The research questionnaires were filled by students of various disciplines, age range 18- 26 years.

2.2. Sampling Technique

A convenient sampling method was used to select the students from the university premises. The study included participants willing to answer the questionnaire and had the right to withdraw from the study. Due to students' exam schedules, some opted to drop out of the study. Out of a circulation of 100 paper-pencil surveys, 61 fully responded to the study.

All the students who were studying at university were allowed to participate in this survey, age range of 18-26 years. Gender, family system, and birth order were also asked so those students who matched the demographic factors were included in the inclusion criteria. Also, students who do not have any physical or mental condition were added. As it was adult sleep quality and anxiety about sleep comparison research, physically disabled students or intellectually disabled students were excluded from this study. Demographic factors also play an important role in data results so students above or below the mentioned age were not included in this research. Lastly talking about gender, individuals other than male and female were added to the exclusion criteria.

2.3. Demographic Information Sheet

Data were gathered on subdivided forms including all three variable scales which also include demographic features such as age, gender, education, birth order, number of siblings, and family system. The demographic form was used to check if these features affect the results of scales used in research.

The age group between 18-21 is 26.6%. The age group between 21-24 is 49.4%. The age group between 24-26 is 1.3%. There were 34.2% male and 43.0% female participants. The income ranged from 20000-50000 (in country's local currency Pakistani Rupee) which was 20.3%. The income range from 50000-80000 was 15.2%. The income range from 80000-100000 was 13.9%. The income range from above 100000 was 27.8%. The students that had FA/FSC level education were 1.3%. The students that had bachelor's level education were 63.3%. The students that had Masters level education were 27.7%. The single participants were 70.9%. The married participants were 3.8%. The divorced participants were 1.3%. The widow participants were 1.3% (Table 1).

Table 1. Demographic characteristics.

Variables	Frequency	Percentage
Marital status		
Single	56	91.8
Married	3	4.91
Divorced	1	1.63
Widow	1	1.63
Age		
18-23	21	26.6
21-24	39	49.4
24-27	1	1.3
Income(PKR)		
20000-50000	16	20.3
50000-80000	12	15.2
80000-100000	11	13.9
Above 100000	22	27.8
Education		
FA/FSC	1	1.3
Bachelors	50	63.3
Masters	10	12.7
Gender		
Male	27	34.2
Female	34	43.0

2.4. Materials

Three variable scales and demographic data forms will be availed for analysis. These actions are integrated which are as follows:

Adult sleep quality short scale by Fortunato et al (2008). It is a 24-item scale. Items are rated on a 5-point Likert-type scale ranging from 1 (never), 2 (Once in a while), 3 (sometimes), 4 (Quite often) to 5 (Not always), 6 (Always).

The ASQ concludes with five subscales named Reinitiating Sleep which include items (1-5), Returning to Wakefulness items (5-9), Go to Bed items (10-14), Falling Asleep items (15-19), and maintaining sleep items were (20-24). The score for each scale is the sum of the ratings for its items. Cronbach alpha=.80; Negative affectivity Cronbach alpha =.86; Positive Affectivity Cronbach alpha=.89; Interpersonal Conflict Cronbach alpha=.80; Work Demands Cronbach alpha=.83; Ambiguity Cronbach alpha=.91; Depression Cronbach alpha=.78; Health Complaints Cronbach alpha=.89; Frustrated Cronbach alpha=.51; Going to bed Cronbach alpha=.71; Falling Asleep Cronbach alpha=.76; Maintaining Sleep Cronbach alpha=.80; Reinitiating Sleep Cronbach alpha=.82; Returning to sleep Cronbach alpha=.86.

The Lucid Dreaming Scale was first developed by Schredl (2002). This is a self-reported questionnaire concluding 22 items. It has 8-point Likert-type scale scoring from 0 (Never), 1 (Less than once a year), 2 (About once a year), 3 (About 2-3 times a year), 4 (About once a month), 5 (About once a week),6 (About twice a week), 7 (About several times a week). Cronbach alpha=.849.

The Anxiety and Preoccupation About Sleep Questionnaire was published by Harvey (2011) which has 10 items present in it. This questionnaire was translated and revised several times in different languages for research purposes. This scale was also a 5-point Likert-type scale ranging from 1-5 as such 1 (Strongly disagree), 2 (Disagree), 3 (Often neutral), 4 (Agree), 5 (Strongly agree). Cronbach alpha=.70.

2.5. Procedure

For data collection, an approval letter from the Psychology Department, Lahore Leads University was signed before data collection commenced. The researcher informed the participants about the purpose of the research. The researcher briefed them about the purpose of research to the participants in the classrooms, university premises, and ground and inform them about the purpose of survey, where they got all the questionnaires filled out by the participants.

Informed consent was also attached to the questionnaires, and requested them to fill it, where they were given a free hand to participate in the survey and were told about the right to withdraw at any point from the study anytime without penalty.

After the data collection was done, the data were entered in SPSS (IBM SPSS, version v.23), to check significant results and test statistics of the data. Different analyses were done on the SPSS to determine all results like Correlation, ANOVA and descriptive tests.

2.6. Ethical Consideration

The study complies with all the ethical necessities described in the Helsinki Declaration and Resolution 8430, which establishes the norms for educational psychological research, according to which this study would be classified as without risk (Ministry of Health, 1993, art.11). Responding to these parameters, the researchers built informed consent for the sample. The paper forms were signed by all the participants who agreed to be part of the study. This study has the endorsement of the Psychology Department at Lahore Leads University, Pakistan.

2.7. Statistics in the research

Pearson product movement correlation is used to test the relationship among adult sleep quality, lucid dreaming, Anxiety, and preoccupation with sleep. Multivariate analysis of variance is used to investigate the impact of age, income, and gender on Adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep.

3. Results

The present study aims to observe the relationship between Adult sleep quality (ASQ), Lucid dreaming (LD), And Anxiety and preoccupation about sleep (APAS) among university students. The study data was examined in four steps. In the first step, descriptive analyses were done. On the other hand, Pearson correlation analysis was conducted to check the correlation among the three mentioned variables. The third step was to conduct the T-Test between ASQ, LD, APAS.

Table 2 shows the descriptive statistics and reliability analysis that was carried out for all the measures. It shows the mean standard deviation and Cronbach alpha with skewness and kurtosis values. Descriptive and reliabilities

Table 2. Descriptive statistics and reliability analysis of Adult sleep quality, Lucid dreaming, and Anxiety and preoccupation about sleep (N=61).

Scales	K	M(SD)	α	Skewness	Kurtosis
Adult sleep quality	24	11.55(2.33)	.631	-.360	-.178
Reinitiating sleep	5	3.92(1.20)	.631	.015	-.575
Return to wakefulness	4	.58 (.51)	.74	-.326	.091
Go to bed	6	5.02(2.33)	.74	-.131	-.131
Falling Asleep	5	4.13(3.45)	.657	.004	.151
Maintaining sleep	5	4.44(3.45)	.679	.007	.163
Lucid dreaming	22	23.91(14.5)	.580	.608	.440
Anxiety and preoccupation with sleep	10	6.73(4.43)	.580	1.601	5.903

Note. K=no. of items; α =Cronbach Alpha

Table 3. The Inter-item correlation among adult sleep quality (reinitiating sleep, returning to wakefulness, falling asleep, going to bed, maintaining sleep), lucid dreaming, and anxiety and preoccupation about sleep (N=61).

Variables	1	2	3	4	5	6	7	8
1. Adult sleep quality	-	.527**	.402**	.573**	.451**	.726**	.140*	.248*
2. Retaining sleep subscale		-	-.008	.238	.026	-.253*	.039	.231
3. Returns to wakefulness subscale			-	-.055	.115	.199	.061	.195
4. Go to bed subscale				-	-.079	.266*	-.078	-.008
5. Falling asleep subscale					-	.217	.187	.169
6. Maintaining sleep subscale						-	.193	.136
7. Lucid dreaming subscale							-	.088
8. Anxiety and preoccupation with sleep								-

Note. p<.05, **p<.01, ***p<.001

of adult sleep quality, lucid dreaming, and preoccupation anxiety about sleep are calculated. The strongest reliabilities are of going to bed and returning to wakefulness which are the sub-scales of adult sleep quality with the α = .740. Maintaining sleep has moderate reliability α = .679. The failing asleep has moderate reliability α = .657. Adult sleep quality and retaining sleep have moderate reliability α = .631. Lucid dreaming and preoccupation about sleep have the lowest or weakest reliability α = .580.

There is a moderately strong association between adult sleep quality and reinitiating sleep (r=.527; p<0.01). Also, there is a strong positive relationship between adult sleep quality and return to wakefulness (r=.402; p<0.01). Further on, there is a strong positive association between adult sleep quality and go to bed (r=.573; p<0.01). There is a strong positive association between adult sleep quality and falling asleep (r=.451; p<0.01). Also, there is a higher positive association between adult sleep quality and maintaining sleep (r=.726; p<0.01). Adult sleep quality has a low and weak relationship with lucid dreaming (r=.140; p<0.01). Adult sleep quality has a low and weak relationship with anxiety and preoccupation about sleep (r=.248; p<0.01) (Table 3).

Multivariate Analysis (MANOVA)

There is no impact of age income and gender on adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep. Hence, no post hoc test was carried out (Table 4).

4.   Discussion

The study reported weak positive correlations within the constructs. Adult sleep quality and dreaming had a low weaker correlation as found in a similar study. Although, the present showed a low and weak correlation, a study had found no correlations between adult sleep quality and lucid dreaming in terms of dream recall (Olsen, 2012). It is important to study whether males or females are more likely to indulge in dream recall or lucid dreaming skills which can be a meaningful extension to the research. Other factors that may impact sleep quality in relation with dreams and anxiety about sleep can be intake of caffeine, workout frequency, hours spent on social media, and video games that were not taken into the study (Hannah, Reider, & Whiting, 2010).

The study reported an insignificant relationship between the three constructs, which is an interesting finding. Adult sleep quality is not a predictor of lucid dreaming and anxiety related to preoccupation with sleep. Declining sleep quality is an eminent issue and studies that explore sleep quality and lucid dreaming with anxiety are in dearth. In one study, participants with inflammatory bowel diseases (IBD) showed no significant difference between adult sleep quality and anxiety related to sleep. Though IBD causes sleep disorders, measuring sleep is a sensitive construct. Adult sleep quality is also subject to change if a person takes medication that it may or may not cause dreaming or anxiety hence further studies can take pre-screening measures related to depression and medicine intake of sample (Kani & Kani, 2019).

Another study has shown that there were no significant changes in night awakenings and lucid dreaming in terms of dream recall. It also depends if an adult is a good sleeper or an irregular sleeper. The specific study that reported such findings took into the sample of smokers and non-smokers too, so prescreening of smoking habit could help to improve methodology further (Leathwood, Chauffard, & Heck, 1982). According to the neuronal group theory, there is role of synaptic activity and different stages of sleep are involved so the sleep function is varied hence it is important to take into account neuronal activity to measure adult sleep quality, which is impacted by any sleep medication (Hill et al., 2020).

According to the humoral sleep theory, there is an involvement of issues like asphyxia and breathing problems due to metabolic disorders hence the construct of sleep is impacted by such issues (Ozer & Ates, 2021).

According to the visceral theory of sleep, the cortical portions of the brain are complicated in processing visual and somatosensory elements of the brain. Hence the cortical response is important to take into account (Levichkina et al., 2021).

According to Tolstoy's (Vein, 2008) theory of sleep, the waking up and falling asleep cycle is very important and the brain becomes habitual with a routine that can impact dreaming hence it is important to take into account the activities that are undertaken by sleepers.

According to Carl Jung's theory of lucid dreaming (2012) gregarious practice is required to be conscious in dreams and there is no such awareness in the student´s sample for example lucid dreaming is induced by guided meditation practice and the use of binaural beats. According to the theory of self-consciousness, the individual needs to be self-aware of himself and his surroundings, and nowadays mindfulness and body scan therapy should be taken to boast

Table 4. MANOVA statistics of adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep (N=61).

Independent variable	Dependent variable	Type all sum of square	DF	Mean square	F	Sig
Age	ASQT	546.680	2	273.340	2.001	.147
	ASQRE	109.099	2	54.549	3.929	.027
	ASQRA	44.468	2	22.234	1.926	.157
	ASQB	59.434	2	29.717	1.191	.313
	ASQFA	18.039	2	9.020	.531	.592
	ASQMS	18.875	2	9.438	.473	.626
	LD	828.377	2	414.188	.702	.501
	APS	61.760	2	30.880	.693	.505
Income	ASQT	271.977	3	90.659	.664	.579
	ASQRE	28.477	3	9.492	.684	.567
	ASQRA	53.372	3	17.791	1.541	.216
	ASQB	7.310	3	2.437	.098	.961
	ASQFA	92.011	3	30.670	1.806	.159
	ASQMS	73.503	3	24.501	1.227	.311
	LD	1395.210	3	465.070	.788	.507
	APS	132.294	3	44.098	.989	.406
Gender	ASQT	46.015	1	46.015	.337	.564
	ASQRE	51.142	1	51.142	3.683	.061
	ASQRA	69.359	1	69.359	6.009	.018
	ASQB	.479	1	.479	.019	.890
	ASQFA	.013	1	.013	.001	.978
	ASQMS	51.213	1	51.213	2.565	.116
	LD	41.261	1	41.261	.070	.793
	APS	26.056	1	26.056	.585	.448

Note. ASQT=Adult Sleep Quality Total; subscales of Adult Sleep Quality: ASQRE=Reinitiating Sleep; ASQRA=Return to Wake; ASQB=Go to Bed; ASQFA=Falling Asleep; ASQMS=Maintaining Sleep; LD=Lucid Dreaming; APS=Anxiety and Preoccupation Sleep.

self-consciousness thus lucid dreaming (Alcaraz- Sanchez, 2023). According to the neurocognitive theory of dreams, symbolism is very important such as archetypes (Liu et al., 2021). Different people have different important symbols that feel meaningful to them that are different in children and adults but empirical dream research needs more evidence as per the adaptive theory. According to the theory of Freud (1990), the unconscious mind is a latent variable that should have been taken into research. According to the Pittsburg Sleep Quality Index (PSQI), different illnesses influence sleep quality and related anxiety. The illness includes IBS irritable bowel syndrome, insomnia, sleep paralysis, cardiac disorders, and cognitive appraisal; disorders moreover use of medication may impact anxiety related to sleep (Yoo et al., 2023). There is an intervention of sleep medication such as benzodiazepines to alter sleep anxiety.

According to the stimulus control theory, anxiety may not be healed unless the body clock is regulated but there is not enough evidence of the opposite is to increasing sleep time and lowering anxiety (Edinger et al., 2021).

According to the theory of mind mental states are different for everyone in terms of beliefs, emotions, and desires that impact sleep quality lucid dreaming, and preoccupation with sleep (Quesque, & Rossetti, 2020).

5. Conclusions

The main purpose of this research was to check the relationship between Adult sleep quality, Lucid dreaming, and

Anxiety and preoccupation about sleep among university students, and also to determine how these variables affect each other. The current study and its findings have the potential to considerably improve understanding of the phenomena under research. It can be used in the academic setting to educate students on Adult sleep quality comparisons and the impact of anxiety and preoccupation about sleep and lucid dreaming. These indigenous studies will add to our understanding of adult sleep quality, lucid dreaming, and anxiety and preoccupation about sleep. In terms of the study's practical implications, the findings show that students who have poor sleep quality will have lower levels of satisfaction about their daily routine life as students as they perform better if their sleep quality is better.

References

Alcaraz-Sanchez, A. (2023). Awareness in the void: a micro-phenomenological exploration of conscious dreamless sleep. Phenomenology and the Cognitive Sciences, 22(4), 867-905. https://doi.org/10.1007/s11097-021-09743-0

Ableidinger, S., & Holzinger, B. (2023). Sleep Paralysis and Lucid Dreaming—Between Waking and Dreaming: A Review about Two Extraordinary States. Journal of Clinical Medicine, 12(10), 3437. https://doi.org/10.3390/jcm12103437

Burzynska, A. Z., Preuschhof, C., Bäckman, L., Nyberg, L., Li, S. C., Lindenberger, U., & Heekeren, H. R. (2010). Age-related differences in white matter microstructure:

region-specific patterns of diffusivity. Neuroimage, 49(3), 2104-2112. https://doi.org/10.1016/j.neuroimage.2009.09.041

Campbell, A. A., Taylor, K. A., Augustine, A. V., Sherwood, A., Wu, J. Q., Beckham, J. C., ... & Ulmer, C. S. (2023). Nightmares: an independent risk factor for cardiovascular disease?. Sleep, zsad089. https://doi.org/10.1093/sleep/zsad089

Cavanaugh, S., Sandino, A., & Zwart, J. (2023). Sleep Strategies and Their Effectiveness in Improving Dreams and Mental Health. Journal of Student Academic Research, 4(1).

Cain-Shields, L. R., Johnson, D. A., Glover, L., & Sims, M. (2020). The association of goal-striving stress with sleep duration and sleep quality among African Americans in the Jackson Heart Study. Sleep Health, 6(1), 117-123. https://doi.org/10.1016/j.sleh.2019.08.007

Chan S. F., Chen T. H., Liao Y. M., Chou K. R., Tsai P. S. (2012). Development and preliminary validation of the Chinese version of the Sleep-Associated Monitoring Index. International Journal of Nursing Studies, 49, 54–64. https://doi.org/10.1016/j.ijnurstu.2011.07.007

Cheng, S. H., Shih, C. C., Lee, I. H., Hou, Y. W., Chen, K. C., Chen, K. T., ... & Yang, Y. C. (2012). A study on the sleep quality of incoming university students. Psychiatry research, 197(3), 270-274. https://doi.org/10.1016/j.psychres.2011.08.011

Christodoulou, N., Maruani, J., d'Ortho, M. P., Lejoyeux, M., & Geoffroy, P. A. (2023). Sleep quality of medical students and relationships with academic performances. L'encephale, 49(1), 9-14. https://doi.org/10.1016/j.encep.2021.09.006

Dhalla, Z. (2022). Student Sleep Patterns when Exposed to Mindfulness Reminders. Undergraduate Honors Theses. William & Mary. Paper 1893. https://scholarworks.wm.edu/honorstheses/1893

Deng, X., Liu, X., & Fang, R. (2020). Evaluation of the correlation between job stress and sleep quality in community nurses. Medicine, 99(4), e18822. https://doi.org/10.1097%2FMD.0000000000018822

Edinger, J. D., Arnedt, J. T., Bertisch, S. M., Carney, C. E., Harrington, J. J., Lichstein, K. L., ... & Martin, J. L. (2021). Behavioral and psychological treatments for chronic insomnia disorder in adults: an American Academy of Sleep Medicine clinical practice guideline. Journal of Clinical Sleep Medicine, 17(2), 255-262. https://doi.org/10.5664/jcsm.8986

Ellis, J., Hampson, S. E., & Cropley, M. (2007). The role of dysfunctional beliefs and attitudes in late-life insomnia. Journal of Psychosomatic Research, 62(1), 81-84. https://doi.org/10.1016/j.jpsychores.2006.06.007

Fortunato, Vincent J., Monique K. LeBourgeois, and John Harsh. "Development of a five-dimensional measure of adult sleep quality." Educational and Psychological Measurement 68.3 (2008): 488-514. https://doi.org/10.1177/0013164407308470

Freud, S. (1900). Psychoanalytic theory. Psychoanalytic theory. In A Review of Personality Theories (Vol. 10). Charles C. Thomas Publisher.

Fulda, S., & Schulz, H. (2010). How treatment affects cognitive deficits in patients with sleep disorders: methodological issues and results. Progress in brain research, 185, 69-90. https://doi.org/10.1016/B978-0-444-53702-7.00005-1

Geise, C., & Smith, J. C. (2023). Mindfulness, Meditation, and Lucid Dreaming: A Narrow vs. Broad-Spectrum Mindfulness Study. Imagination, Cognition and Personality, 42(3), 263-280. https://doi.org/10.1177/02762366221113292

Germain, A., Markwald, R. R., King, E., Bramoweth, A. D., Wolfson, M., Seda, G., ... & Wallace, M. L. (2021). Enhancing behavioral sleep care with digital technology: study protocol for a hybrid type 3 implementation-effectiveness randomized trial. Trials, 22(1), 1-14. https://doi.org/10.1186/s13063-020-04974-z

Haimov, I., Hanuka, E., & Horowitz, Y. (2008). Chronic insomnia and cognitive functioning among older adults. Behavioral sleep medicine, 6(1), 32-54. https://doi.org/10.1080/15402000701796080

Harvey, A. G. (2001). I can't sleep, my mind is racing! An investigation of strategies of thought control in insomnia Allison G. Harvey. Behavioral and Cognitive Psychotherapy, 29(1), 3-11. https://doi.org/10.1017/S1352465801001023

Heming, M., Xu, T., Nyberg, A., & Magnusson Hanson, L. L. (2021). The relationship between onset of workplace violence and onset of sleep disturbances in the Swedish working population. Journal of sleep research, 30(5), e13307. https://doi.org/10.1111/jsr.13307

Hill, V. M., O'Connor, R. M., & Shirasu-Hiza, M. (2020). Tired and stressed: Examining the need for sleep. European Journal of Neuroscience, 51(1), 494-508. https://doi.org/10.1111/ejn.14197

Jalan, S., Priya, V., & Gayathri, R. (2023). Awareness On Effects of Sleep Deprivation Among College Students-A Questionnaire Based Survey. http://dx.doi.org/10.47750/jett.2022.13.06.002

Jansson-Fröjmark, M., & Sunnhed, R. (2020). Psychometric properties of two brief versions of cognitive, insomnia-specific measures: the anxiety and preoccupation about sleep questionnaire and the sleep-associated monitoring index. Psychological Reports, 123(3), 966-982. https://doi.org/10.1177/0033294119832980

Jung, C. G. (2012). Psychology of the Unconscious. Courier Corporation.

Levichkina, E. V., Busygina, I. I., Pigareva, M. L., & Pigarev, I. N. (2021). The mysterious island: insula and its dual function in sleep and wakefulness. Frontiers in systems neuroscience, 14, 592660. https://doi.org/10.3389/fnsys.2020.592660

Li, J., Vitiello, M. V., & Gooneratne, N. S. (2022). Sleep in normal aging. Sleep medicine clinics, 17(2), 161-171. https://doi.org/10.1016/j.jsmc.2017.09.001

Liu, D., Kahathuduwa, C., & Vazsonyi, A. T. (2021). The Pittsburgh Sleep Quality Index (PSQI): Psychometric and clinical risk score applications among college students. Psychological Assessment, 33(9), 816–826. https://doi.org/10.1037/pas0001027

Maratia, F., Bacaro, V., & Crocetti, E. (2023). Sleep is a family affair: A systematic review and meta-analysis of longitudinal studies on the interplay between adolescents' sleep and family factors. International Journal of Environmental Research and Public Health, 20(5), 4572. https://doi.org/10.3390/ijerph20054572

Mead, M. P., & Irish, L. A. (2020). Application of health behaviour theory to sleep health improvement. Journal of sleep research, 29(5), e12950. https://doi.org/10.1111/jsr.12950

Morin, C. M., Belleville, G., Bélanger, L., & Ivers, H. (2011). The Insomnia Severity Index: psychometric indicators to detect insomnia cases and evaluate treatment response. Sleep, 34(5), 601-608. https://doi.org/10.1093/sleep/34.5.601

Oyebode, O., Alhasani, M., Mulchandani, D., Olagunju, T., & Orji, R. (2021, August). SleepFit: a persuasive mobile app for improving sleep habits in young adults. In 2021 IEEE 9th International Conference on Serious Games and Applications for Health (SeGAH) (pp. 1-8). IEEE.

Özer, Z., & Ateş, S. (2021). Effects of laughter yoga on hemodialysis patients' plasma-beta endorphin levels, pain levels and sleep quality: a randomized controlled trial. Complementary therapies in clinical practice, 43, 101382. https://doi.org/10.1016/j.ctcp.2021.101382

Palagini, L., Maria Bruno, R., Gemignani, A., Baglioni, C., Ghiadoni, L., & Riemann, D. (2013). Sleep loss and hypertension: a systematic review. Current pharmaceutical design, 19(13), 2409-2419.

Pilcher, J. J., & Morris, D. M. (2020). Sleep and organizational behavior: implications for workplace productivity and safety. Frontiers in Psychology, 11, 45. https://doi.org/10.3389/fpsyg.2020.00045

Quesque, F., & Rossetti, Y. (2020). What do theory-of-mind tasks actually measure? Theory and practice. Perspectives on Psychological Science, 15(2), 384-396. https://doi.org/10.1177/1745691619896607

Ratcliff, R., & Van Dongen, H. P. (2009). Sleep deprivation affects multiple distinct cognitive processes. Psychonomic bulletin & review, 16(4), 742-751. https://doi.org/10.3758/PBR.16.4.742

Raz, L., Knoefel, J., & Bhaskar, K. (2016). The neuropathology and cerebrovascular mechanisms of dementia. Journal of Cerebral Blood Flow & Metabolism, 36(1), 172-186. https://doi.org/10.1038/jcbfm.2015.164

Roberts, R. E., Roberts, C. R., & Duong, H. T. (2009). Sleepless in adolescence: prospective data on sleep deprivation, health and functioning. Journal of adolescence, 32(5), 1045-1057. https://doi.org/10.1016/j.adolescence.2009.03.007

Rodríguez-Barragán, M., Fernández-San-Martín, M. I., Clavería, A., Le Reste, J. Y., Nabbe, P., Motrico, E., ... & Peguero-Rodríguez, E. (2023). Measuring depression in Primary Health Care in Spain: Psychometric properties and diagnostic accuracy of HSCL-5 and HSCL-10. Frontiers in Medicine, 9, 1014340. https://doi.org/10.3389/fmed.2022.1014340

Rolim, S. A. M., Bulkeley, K., Esmaile, S. C., Soares, B. L., Araújo, D. B. D., & Ribeiro, S. T. G. (2020). The dream of God: how do religion and science see lucid dreaming and other conscious states during sleep.https://doi.org/10.3389/fpsyg.2020.555731

Schmickler, J. M., Blaschke, S., Robbins, R., & Mess, F. (2023). Determinants of Sleep Quality: A Cross-Sectional Study in University Students. International Journal of Environmental Research and Public Health, 20(3), 2019. https://doi.org/10.3390/ijerph20032019

Schredl, M. (2002a). Questionnaires and Diaries as Research Instruments in Dream Research: Methodological Issues. Dreaming, 12(1), 17–26. https://doi.org/10.1023/A:1013890421674

Stumbrys, T. (2021). The Luminous Night of the Soul: The Relationship between Lucid Dreaming and Spirituality. International Journal of Transpersonal Studies, 40(2), 6. doi.org/10.24972/ijts.2021.40.2.64

Tang, N. K., & Harvey, A. G. (2003). Anxiety and Preoccupation about Sleep Questionnaire. Behaviour Research and Therapy. https://psycnet.apa.org/doi/10.1037/t03133-000

Tang, N. K., Saconi, B., Jansson-Fröjmark, M., Ong, J. C., & Carney, C. E. (2023). Cognitive factors and processes in models of insomnia: A systematic review. Journal of Sleep Research, e13923. https://doi.org/10.1111/jsr.13923

Tir, S., White, R., & Spitschan, M. (2023). Inclusion, reporting and analysis of demographic variables in chronobiology and sleep research. bioRxiv, 2023-03. doi: https://doi.org/10.1101/2023.03.28.534522

Troxel, W. M., Buysse, D. J., Hall, M., & Matthews, K. A. (2009). Marital happiness and sleep disturbances in a multi-ethnic sample of middle-aged women. Behavioral sleep medicine, 7(1), 2-19. https://doi.org/10.1080/15402000802577736

Tyni, K. (2024). On supporting well-being: A mixed methods study to investigate how Fortum's Wellbeing Services support physical, social and psychological well-being.

Tzioridou, S., Dresler, M., Sandberg, K., & Mueller, E. M. (2022). The role of mindful acceptance and lucid dreaming in nightmare frequency and distress. Scientific Reports, 12(1), 15737. https://doi.org/10.1038/s41598-022-19624-4.

Vein, A. A. (2008). Leo Tolstoy's theory of sleep. Sleep Medicine, 9(3), 320-323.

Vgontzas, A. N., Fernandez-Mendoza, J., Liao, D., & Bixler, E. O. (2013). Insomnia with objective short sleep duration: the most biologically severe phenotype of the disorder. Sleep medicine reviews, 17(4), 241-254. https://doi.org/10.1016/j.smrv.2012.09.005

Yoo, L., Tsai, C. S., Heitkemper, M., & Kamp, K. (2023). Systematic review: Individual-level factors and social determinants of health impacting sleep health in individuals with inflammatory bowel disease. Journal of Advanced Nursing. https://doi.org/10.1111/jan.15576

Xiao, S., Shi, L., Zhang, J., Li, X., Lin, H., Xue, Y., ... & Zhang, C. (2023). The role of anxiety and depressive symptoms in mediating the relationship between subjective sleep quality and cognitive function among older adults in China. Journal of Affective Disorders, 325, 640-646. https://doi.org/10.1016/j.jad.2023.01.048

Wong, S. S., & Yu, C. K. C. (2022). Lucid nightmare as a state midway between nightmare and lucid dream. Dreaming, 32(1), 63. https://psycnet.apa.org/doi/10.1037/drm0000188

Zhang, J., He, M., Wang, X., Jiang, H., Huang, J., & Liang, S. (2023). Association of sleep duration and risk of mental disorder: a systematic review and meta-analysis. Sleep and Breathing, 1-20. https://doi.org/10.1007/s11325-023-02905-1