

Correlation of Between Sleep Quality, Perceived Stress Reactivity, Expressive Suppression and Finding Gender Difference in Emotion Regulation Strategy in Young Adults

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ABSTRACT

The current study correlation between sleep quality, perceived stress reactivity and expressive suppression and gender difference in emotion regulation strategy in young adults was conducted on a sample of 202 participants selected through convenience sampling to see the relationship between sleep quality, perceived stress reactivity, expressive suppression strategy and the potential gender difference in the use of emotion regulation strategy. The findings indicate that poor sleep quality is associated with increased stress reactivity and use of expressive suppression strategy and there is a potential difference in genders in using expressive suppression technique while no such difference occurs in the use of cognitive reappraisal.

Keywords: *Sleep Quality, Perceived Stress Reactivity, Expressive Suppression, Gender Difference, Emotion Regulation Strategy*

The degree to which a person is content with every facet of their sleep experience is known as the quality of their sleep. The four components of sleep quality that are: sleep latency, Sleep duration, sleep efficiency and Wake after sleep onset. (Klien,2013) The process by which people control the emotions they experience, when they experience them, and how they express them is known as emotional regulation. This intricate mechanism encompasses a wide range of cognitive and behavioural strategies focused at modulating emotional experiences in response to both internal and external stimuli. One Such positive strategy of Emotion Regulation is Cognitive Reappraisal it can either be positive or negative. Positive Cognitive Reappraisal include looking at the situation or reframing it in a way that increase the positive emotions. While negative reappraisal involves reframing an experience in a way that decrease the negative emotions. Thus, both positive and negative reappraisal focus majorly on increasing the positive emotions and decreasing the negative ones. (Davis,2024). Another Emotion Regulation strategy is Expressive Suppression which is more of a negative Emotion Regulation strategy. It refers to concealing or reducing the expression of emotions being felt. (Gross and Levenson, 1993). Perceived stress reactivity is a psychological term that describes an individual's tendency to respond to stresses with both immediate and long-lasting stress

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reactions. It may be a reliable predictor of both current and potential negative health effects (Limm et.al. 2010). The effects of sleep quality on young people' emotional and physiological stress reactions become critical as they handle the demands of their personal, professional, and academic lives. The identification of gender-specific patterns in emotion regulation methods might facilitate the development of focused therapies, which in turn can improve resilience and lessen inequities in mental health among this population. This study's justification stems from the growing understanding of the complex interactions that exist between sleep patterns and mental health. Through examining the potential impact of sleep quality variations on an individual's capacity to manage stressors and emotions, this study intends to provide important information for both preventive mental health treatments and customized support plans.

Theoretical framework

The theories on sleep gives idea about the necessity to have a good quality of sleep. (Kaylor, 2022) The Adaptive Theory is one of the earliest sleep theories, proposes sleep as an adaptive activity evolved to avoid predators and environmental risks. Natural selection is believed to have shaped sleep behaviour to ensure safety during vulnerable periods, such as night time. Theory of Energy Conservation suggests that sleep's primary function is to reduce energy demand and expenditure during part of the day and night. Because the body's temperature and caloric requirement drop during sleep, studies have revealed a considerable decrease in energy metabolism throughout the sleep cycle, suggesting that sleep's principal purpose is to allow organisms to save energy resources. Restorative Theories views sleep is essential for the body's ability to repair and replace its cellular components, which is how physiological functions are restored. Sleep cycles are important for a variety of biological processes, including protein synthesis, growth hormone release, muscle repair, and tissue growth. The Theory of Brain Plasticity says that sleep is essential for the growth and development of the brain's function as well as for neural reorganization. Brain plasticity plays a crucial role in adapting to experiences, acquiring knowledge, and responding to changes in the environment. For this reason, newborns sleep for up to 14 hours per day in order to facilitate brain growth. These, sleep theories offer valuable perspectives on the evolutionary and adaptive nature of sleep. Recognizing sleep as a mechanism to conserve energy, avoid environmental risks, and facilitate tissue repair provides a holistic understanding of its significance. According to Gross's (1998) Process Model of Emotion Regulation, people can control their emotions by using a series of behavioral and cognitive techniques. There are five steps to it: Situation Modification (attempting to change the situation to influence emotional responses); Attentional Deployment (shifting focus to regulate emotional experiences); Cognitive Change (modifying thoughts to regulate emotions); and Response Modulation (regulating overt emotional expressions or physiological responses) are the five types of situation selection. This model emphasizes the dynamic aspect of emotion regulation and the variety of strategies people use to control their emotional manifestations and experiences. One of the primary strategies in Gross's paradigm is cognitive reappraisal. It involves reevaluating a circumstance to decrease its emotional impact. Reinterpreting a challenging situation as an opportunity for personal growth, for example, can produce a more positive emotional response. The last strategy is response modulation, also known as expressive suppression, which is the regulation of emotional responses by physiological, expressive, or behavioral means. For instance, people may employ relaxation techniques, stifle their facial expressions, or control the tone of their voice in order to control their emotional reactions. Understanding how young adults perceive and respond to stress can help identify individuals at risk for mental health issues and work-

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related challenges. This knowledge can guide the development of targeted interventions and support systems, improving their ability to manage stress and enhancing their overall well-being and productivity (Hay & Diehl, 2010).

REVIEW OF LITERATURE

Dahl et al. (2023) conducted a study on 2563 adolescents of Innova school in Peru it was found out that poor sleep quality was strongly linked to challenges in emotion regulation in particular, the link was discovered for the emotion regulation subscales that measure emotional clarity, coping mechanisms, and the capacity to act in a goal-directed manner when faced with discomfort. Pal, Moitra & Madan (2023) conducted a study 1210 adults of age range 18-60 years. The findings revealed that emotional eaters reported considerably higher global PSQI ratings, higher perceived stress scores, and significantly lower overall healthy eating habits scores than non-emotional eaters. Samea et al. (2023) conducted research to evaluate the impact of moderating factors on the relationship between insomnia and poor emotion regulation. The results of this quantitative meta-analysis show a strong correlation between poor ER and insomnia. Trembley & Talley (2020) examined if Emotion Regulation mediates the association between Mindfulness and Sleep Quality on a sample of 377 undergraduate students. The results indicate that hyperarousal, avoidance, and intrusive thoughts are associated with poorer overall sleep quality. Levens, Elrahal & Sagui (2016) conducted a study on 181 freshman undergraduate participants the result indicated Family emotional support substantially shields against depression symptoms when perceived stress reactivity is minimal however, family emotional support is less effective in preventing depression when a person exhibits high levels of perceived stress reactivity.

METHODOLOGY

Aim

The aim of this research is to investigate the correlation of sleep quality with perceived stress reactivity and on the utilization of expressive suppression as an emotion regulation strategy, while also exploring potential gender differences in the use of emotion regulation strategies in young adults.

Objectives

- To assess the relationship between sleep quality and perceived stress reactivity in young adults.
- To examine the association between sleep quality and the utilization of Expressive Suppression as an emotion regulation strategy in young adults.
- To investigate if there is any gender difference in use of Emotion Regulation strategies of expressive suppression and cognitive reappraisal in young adults.

Hypothesis

- H1: Good sleep quality will be associated with low Perceived Stress Reactivity in young adults.
- H2: Higher sleep quality will be positively correlated with lower utilization of Expressive Suppression as an emotion regulation strategy in young adults.
- H3: There will be a significant gender difference in the utilization of different Emotion Regulation strategies in young adults.

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Sample and its selection

A sample of 202 young adults of age range 21-30 years participated in the study. Convenience sampling method was used to select the participants.

Inclusion Criteria

Data of young adults aged 21 to 30 years was taken and non-clinical sample was taken into consideration.

Exclusion Criteria

Individuals outside the specified young adult age range were excluded along with individuals who showed symptoms of chronic medical conditions affecting sleep or stress reactivity

Research Design

Quantitative correlational research design

Description of tools employed

- **Pittsburg Sleep Quality Index-** The Pittsburgh Sleep Quality Index (PSQI) is a widely used self-report questionnaire assessing sleep quality over the past month. It comprises 19 items grouped into seven components, including subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication, and daytime dysfunction. The PSQI demonstrates good reliability and validity, with high internal consistency (Cronbach's alpha > 0.70), a test-retest reliability of .85 for the global scale and strong correlations with objective measures of sleep. It has been validated across diverse populations and exhibits sensitivity to changes in sleep quality over time.
- **Emotion Regulation Questionnaire-** The Emotion Regulation Questionnaire (ERQ) is a 7-point Likert type scale which is used to measure individual's tendency to regulate their emotions either through Cognitive Reappraisal or Expressive Suppression. Internal consistency coefficients for the ERQ often range from 0.70 to 0.80 for both subscales, indicating strong validity and reliability. Convergent validity of the ERQ with other emotion regulation measures has also been demonstrated. The scale has ten items total; four measure expressive suppression and six measure cognitive reappraisal.
- **Perceived Stress Reactivity Scale-** The Perceived Stress Reactivity Scale (PSRS) is a 23-item questionnaire with 5 subscales and 1 overall scale designed to evaluate individual differences in stress reactivity. Numerous studies have shown that it has strong validity and reliability. The scale demonstrates good internal consistency (Cronbach's alpha > 0.80) and test-retest reliability over a two-week interval (intraclass correlation coefficient > 0.70). Construct validity is supported by significant correlations with related constructs, such as perceived stress and coping strategies. The PSRS has been widely used across diverse populations and settings, making it a reliable instrument for assessing perceived stress reactivity in research studies.

Statistical Analysis

Correlation and T-Test analysis were used to investigate the relationship among variables and the potential gender difference respectively.

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Correlation Analysis was used to investigate the relationship between Sleep Quality, Perceived Stress Reactivity and the use of expressive suppression strategy of emotional regulation. Pearson Correlation Coefficient was calculated based on the distribution properties of the variables. To evaluate the degree of association between variables, correlations were analysed based on their strength and direction and T-Test Analysis was used to investigate the possible differences in gender in the application of the two emotion regulation strategies of Expressive Suppression and Cognitive Reappraisal. Male and female participants' mean scores on the both these strategies were compared using an independent-samples t-test. If there was a statistically significant difference in the gender-to-gender differences in the scores, it was ascertained using the significance level (p-value).

RESULT

Table:1 Showing the relationship between sleep quality and perceived stress reactivity in young adults

CORRELATION			
		Perceived Stress Reactivity	Global Sleep Quality
Perceived Stress Reactivity	Pearson Correlation	1	.389**
	Sig. (2-tailed)		<.001
	N	202	202
Global Sleep Quality	Pearson Correlation	.389**	1
	Sig. (2-tailed)	<.001	
	N	202	203

** . Correlation is significant at the 0.01 level (2-tailed).

Table:2 Showing the relationship between sleep quality and Expressive Suppression

CORRELATION			
		ES Total	Global Sleep Quality
ES Total	Pearson Correlation	1	.999**
	Sig. (2-tailed)		<.001
	N	203	203
Global Sleep Quality	Pearson Correlation	.999**	1
	Sig. (2-tailed)	<.001	
	N	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

Table: 3 Showing difference in the use of Expressive Suppression and Cognitive Appraisal strategy of emotion regulation among males and females. strategy of Emotion Regulation

GROUP STATISTICS					
	Male=1 Female=2	N	Mean	Std. Deviation	Std. Error Mean
ES Total	Male	91	19.49	4.689	.492
	Female	111	16.59	4.911	.466
CR Total	Male	91	29.91	6.164	.646
	Female	111	28.78	6.628	.629

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		Levene's Test for Equality of Variances				Significance		t-Test for Equality of Means		95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
ES Total	Equal variances assumed	.054	.816	4.274	200	<.001	<.001	2.909	.681	1.567	4.251
	Equal variances not assumed			4.294	195.379	<.001	<.001	2.909	.677	1.573	4.245
CR Total	Equal variances assumed	.145	.704	1.242	200	.108	.216	1.128	.908	-.663	2.920
	Equal variances not assumed			1.251	196.810	.106	.212	1.128	.902	-.650	2.907

DISCUSSION

The degree to which a person is content with every facet of their sleep experience is known as the quality of their sleep. The four components of sleep quality that are: sleep latency that is defined as the duration of time it takes for someone to get asleep a 5-to 15-minute sleep latency is typical, Sleep duration, sleep efficiency that refers to the percentage of time spent sleeping compared to the total amount of time spent in bed and Wake after sleep onset that is a statistic used in sleep research to quantify how long an individual stays awake, spanning from the moment they fall asleep to the point at which they are fully awake and do not try to fall back asleep. For this statistic, minutes are the typical unit of measurement. (Klien,2013) The process by which people control the emotions they experience, when they experience them, and how they express them is known as emotional regulation. Emotional regulation can impact the process of producing emotions at one or more stages and can be either automatic or managed, conscious or unconscious. (Gross,1998). Perceived stress reactivity is a psychological term that describes an individual's tendency to respond to stresses with both immediate and long-lasting stress reactions. It may be a reliable predictor of both current and potential negative health effects (Limm et.al. 2010).

This research was conducted on a sample of 202 young adult participants of age range 21-30 to see if the quality of sleep has an effect on the perceived stress reactivity and the use of cognitive reappraisal strategy of emotion regulation in young adults and to find out if there is a significant gender difference in the use of Expressive Suppression and Cognitive Reappraisal strategy of emotion regulation. The results obtained are as follows:

From Table 1 it can be interpreted that Perceived Stress Reactivity and Global Sleep Quality appear to be positively correlated, however not very strongly, according to the correlation coefficient of 0.389. This means that as the score of Perceived stress reactivity scale increases the score of Pittsburg Sleep Quality also increases which refers to poor sleep quality, which further means that poor sleep quality is linked to increased Perceived Stress Reactivity in young adults. Accordingly, there is a tendency for Global Sleep Quality to decline and Perceived Stress Reactivity to rise. The statistical significance of the correlation between the two variables in the population sampled is indicated by the p-value of less than 0.001, which implies a strong and dependable association between them. This result is consistent with earlier studies showing the negative effects of stress on sleep quality. Increased arousal, trouble falling asleep, and intrusive thoughts are all linked to high levels of perceived stress reactivity, and these factors can interfere with sleep patterns and lower the quality of sleep. On the other hand, people who get better quality sleep might be more resilient to stress, which would result in reduced levels of perceived stress reactivity. Stress

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may make it harder to get a good night's sleep, but a bad night's sleep can make stress worse, leading to a vicious cycle that can be detrimental to one's general health.

Table 2 shows that the Global Sleep Quality total scores and Expressive Suppression (ES) Total scores have an extraordinarily high correlation coefficient of 0.999, indicating a nearly complete positive association between the two variables. It follows that people who report better quality sleep overall have a tendency to show higher levels of Expressive Suppression, whereas people who report worse quality sleep have a tendency to show lower levels of Expressive Suppression. The correlation's significance at the two-tailed 0.01 level suggests that the association is most likely to be true in the larger population and is very unlikely to have happened by accident. This result reinforces the body of research that indicates a strong correlation between poor sleep quality and emotion control techniques of Expressive Suppression.

From the third result table it can be interpreted that according to group statistics, the mean scores of male participants ($M = 19.49$, $SD = 4.689$) on the Expressive Suppression were considerably higher than those of female participants ($M = 16.59$, $SD = 4.911$). This shows that, generally speaking, men in the group exhibit higher degrees of emotion repression than do females. The substantial difference in Expressive Suppression scores between males and females is supported by the independent samples t-test, which is performed both with and without the assumption of equal variances ($t = 4.294$, $p < .001$). Male and female Expressive Suppression score differences were from 2.909 on average, with a 95% confidence interval from 1.567 to 4.251. These findings suggest that there is a statistically significant difference in total Expressive Suppression scores between males and females, which is unlikely to have happened by accident.

However, it is also seen that the mean Cognitive Reappraisal (CR) scores of male participants ($M = 29.91$, $SD = 6.164$) and female participants ($M = 28.78$, $SD = 6.628$) did not significantly differ, according to group statistics. This shows that within the sample, there is no significant difference in the average levels of cognitive reappraisal between males and females. The results of the independent samples t-test demonstrate that there is no statistically significant difference in the Cognitive Reappraisal scores between males and females, regardless of whether equal variances are assumed ($t = 1.242$, $p = .108$) or not ($t = 1.251$, $p = .106$). Male and female CR Total score differences ranged from 1.128 to 2.920, with a 95% confidence interval between -0.663 and 2.920. Thus, there is no significant difference in the use of Cognitive Reappraisal Strategy of Emotion Regulation among males and females.

Thus, the result imply that there is a significant difference among both the genders in the use of Expressive Suppression strategy of emotion regulation while there is no significant difference in the use of cognitive reappraisal strategy of emotion regulation.

Hardikar & Kolekar (2023) conducted a study on 117 adults to assess the correlation between Insomnia, Emotion Regulation and aggression. The result of the showed that there is a negative correlation between Insomnia and Cognitive Reappraisal and also between aggression and Cognitive Reappraisal. Newman et al. (2022) used a daily diary technique, to investigate the reciprocal links between sleep, emotions, and everyday occurrences in 181 mothers who were asked to complete one week of morning and evening questionnaires at three successive times, separated by nine months each, for a total of 21 days. The results

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through Multilevel modelling analyses showed that Longer sleep duration and higher subjective quality were found to predict more positive and fewer negative emotions upon waking, as well as lower levels of peak perceived stressfulness, but not peak positivity ratings. Allen, Wetherall & Smith (2020) conducted a study on 72 the results proved that Four weeks after writing about a positive emotional topic, these people showed significantly lower levels of sadness and perceived stress reactivity as compared to when writing about a neutral topic.

To sum up, the research findings have substantial implications for young individuals attempting to navigate the complexities of modern life. This work offers important insights that can guide interventions catered to the specific requirements of young adults by illuminating the complex links between stress reactivity, emotion regulation, and sleep quality. Understanding the variables affecting sleep quality is essential for encouraging optimal mental and physical performance in this population, since sleep plays a critical role in general health and well-being. Furthermore, the discovery of gender variations in emotion regulation techniques emphasizes how crucial it is to take gender-specific methods into account when developing interventions. Interventions can enable individuals to handle stress and emotions more effectively, minimize vulnerability to mental health issues, and improve sleep quality by treating sleep disruptions and teaching young adults appropriate coping mechanisms.

More more, this research has wider societal significance than only effects on an individual's well-being. Interventions that support the mental resilience and quality of sleep of young adults may help create healthier communities and raise a generation that is better suited to survive in a world that is becoming more complicated and fast-paced. As a result, this research opens the door for future initiatives focused on enhancing young adults' mental health and wellbeing, ultimately leading to a more promising and resilient future.

Limitations of the study

- The findings can't be generalised for any age group other than 21-30.
- The data was collected through self-report measures which may not accurately reflect subtle variations in emotion control or objective sleep characteristics due to response biases.
- Potential confounding variables that could affect the associations identified, such as medication use or daily changes in stress levels, were not taken into consideration in this study.
- Gender was limited to males and females.

Suggestions

- Increase the number of participants in the study by involving people from a wider variety of age groups, cultural backgrounds, and clinical populations. This would improve the findings' generalizability and provide a more thorough knowledge of the variables affecting sleep and emotion regulation.
- Design and evaluate focused interventions to help young adults become more adept at controlling their emotions and getting better sleep. The effectiveness of programs combining mindfulness-based stress reduction, cognitive-behavioral strategies, or teaching on good sleep hygiene may be better understood through randomized controlled studies.

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Conflict of Interest

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