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THE EFFECT OF RUMINATION ON AGGRESSION & QUALITY SLEEP AMONG YOUNG AND MIDDLE-AGED ADULTS

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ABSTRACT

The purpose of study is to investigates the relationship between rumination, aggression, and sleep quality among young and middle-aged adults, with a focus on gender and age differences. The study aims to examine that how rumination affects aggression and sleep quality and to explore predictive role of rumination in variables. A sample of 300 participants, comprising (n=114) males and (n=186) females, was selected. The statistical analyses, including Pearson correlation, linear regression, and t-tests, were conducted to test the hypotheses. The results reveal the positive relationship between rumination and aggression, indicating that the higher rumination levels are associated with the increased aggression. A negative but weak correlation between rumination and sleep quality was found, suggesting that increased rumination is associated with poor sleep quality. Moreover, age differences were significant, with young adults scoring higher in aggression and sleep quality than middle-aged adults. The findings provide valuable insights into the cognitive processes associated with aggression and sleep patterns, emphasizing the importance of addressing rumination to improve overall well-being.

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INTRODUCTION

Rumination refers to the repetitive attention on negative feelings, events, and their repercussions, often leading to emotional pain and cognitive disturbances. This mental process can exacerbate psychological issues such as sadness, anxiety, and emotional dysregulation (Clancy, Prestwich, & Caperon, 2020). Individuals caught in cycles of ruminating suffer problems moving past hostile experiences, leading toward prolonged mental and emotional strain (Kapoor & Shruti, 2024). Such

cognitive habits can impede one's ability to concentrate, interrupt sleep, and heighten feelings of irritation, despair, and violence. Rumination is the process of thinking on origins and consequences of one's own dissatisfaction in a repetitive and passive manner. However, the person does not act on these thoughts by using proactive coping techniques or problem-solving techniques, which would lessen anxiety and elevate mood (Michl, McLaughlin, Shepherd & Hoeksema, 2013). Research has demonstrated that chronic ruminating can have major repercussions for mental health, altering emotional well-being and quality of life. People who ruminate frequently find themselves locked in the negative thinking loops, unable to let go of the upsetting previous events. In this regard, this inefficient thinking pattern not only intensifies emotional distress but also hinders the general cognitive functioning.

Evidence suggests that persons engaging in rumination often have diminished concentration and impaired decision-making ability. The inability to detach from unpleasant thoughts can damage the personal relationships, work performance, and general life satisfaction. In other circumstances, ruminators demonstrate higher levels of hostility, lashing out at others owing to emotional tiredness and frustration (Mehraban, Nasab, & Vafa, 2023). This aggressive behavior generally arises from accumulated unpleasant feelings, amplified by repeated mental playback of distressing scenarios. The link amid rumination and aggression has been of special interest to scholars. Aggression, which can express physically, verbally, is often a response to unresolved emotional distress. Aggression is defined by social psychologists as actions meant to cause harm to someone who does not want to be injured (Baron & Richardson, 1994). Due to the subjective nature of intent, an action that appears violent from one perspective may not appear so from another, and same damaging activity may or may not be aggressive depending on motive behind it. People who fixate on negative events, such as interpersonal conflicts or prior failures, may develop heightened irritation and hostility. In severe situations, these feelings lead to angry or violent behavior, inflicting harm to others or harming personal relationships.

Impulsive violence, often unplanned and emotionally driven, is typically related with rumination, especially when anger and frustration dominate the mental process. In addition to psychological anguish, ruminating can dramatically influence physical well-being, particularly sleep quality. Sleep, which is vital for both physical and mental health, is often disrupted by excessive ruminating. Sleep is an important physiological process for humans. Although the direct benefits of sleep is not well quantified across many populations, it is understood that sleep deprivation has serious health consequences (Lavie et al., 2002). Quality of sleep is a measure of both quantitative and qualitative components of sleep. The quantitative component includes the duration of sleep while qualitative component is subjective measure of depth and feeling of restfulness upon awakening (Buysse et al., 1988). Individuals coping with rumination may meet worries falling asleep, regular awakenings, or poor-quality sleeps and persistent thoughts about distressing events, is a cognitive process linked to various outcomes. The inability to quiet mind and disengage from persistent negative thoughts might donate to sleep difficulties, leading to greater emotional dysregulation. Sleep deprivation, in turn, exacerbates feelings of irritation, anger, & irritability, producing vicious cycle of emotional and cognitive failure.

Research has consistently shown that ruminating is a maladaptive coping mechanism, since it stops individuals from efficiently processing & moving past traumatic experiences. Rather than exploring solutions or gaining understanding, ruminators remain locked in a loop of negative thinking. While some forms of rumination, such as reflective rumination, may first appear useful by facilitating self-analysis, they can still lead to persistent emotional pain if not managed effectively. Brooding rumination, which focuses on self-criticism and negative feelings, is particularly damaging, often resulting in sadness, anxiety & aggressiveness. The constant negative concentration characteristic of rumination generates fertile ground for aggressiveness to grow, particularly when individuals feel helpless or out of control. The physiologic basis of violence, such as hormone imbalances or neurotransmitter disorders, may also overlap with cognitive processes evident in rumination. For example, imbalance of serotonin and dopamine levels is linked to violent tendencies and mood problems. These neurochemical changes, together with mental pressure generated by rumination, can contribute to heightened emotional reactivity & violent conduct. Environmental factors, such as stressful life events or social isolation, further contribute to the development of violence in those prone to rumination.

Research Hypothesis

H1: The rumination will positively correlate with the aggression of individuals
H2: The rumination will negatively correlate with the sleep quality of the individuals
H3: Individuals have significant age difference of rumination on aggression & quality of sleep
H4: Individuals have significant gender difference of rumination on aggression & quality of sleep
H5: The rumination will significantly predict aggression and sleep quality in the particular context

LITERATURE REVIEW

Researches indicate that ruminating may elevate aggression and reduce sleep quality, with self-centered rumination associated with high anger and physiological arousal. However, research of this nature neglects the disparities in aggression levels between genders. Rumination has been shown to diminish sleep quality, especially in individuals with high levels of trait rumination, as evidenced by Guastella and Moulds (2007). The connection between rumination and aggression and sleep disorders are inadequately investigated, especially within a cohesive framework. This study investigates the interplay between rumination, aggression, and sleep quality, drawing on theories such as the General Aggression Model and emphasizing the effects of ruminating on both psychological and physiological outcomes. The rumination, particularly anger-related rumination, has been repeatedly associated to aggressive behavior. Researches indicate that persons who get involved in anger rumination, consistently thinking about anger-inducing experiences are more likely to exhibit aggressive actions. Research by Bushman (2002) and Peters et al. (2015) suggests that recalling anger-provoking situations may boost violent behaviors over time. This rumination not only increases anger but also intensifies aggressive cognition and arousal, which ultimately contribute to violence.

Both experimental and non-experimental studies reveal that high ruminators tend to indicate the increased aggression relative to low ruminators, particularly in provocation settings (Caprara et al., 2007). Additionally, research has found that hostile rumination predicts long-term violent and

antisocial behaviors, especially in adolescents. This activity might be impulsive, motivated by high emotions, or instrumental, with a particular purpose in mind. A crucial gap in the literature exists about gender variations in how rumination influences the violence. Studies by Katie et al. (2014) showed that rumination predicts aggressive conduct in teenage boys but not girls, saying that link between rumination, aggression, and internalizing symptoms may differ across genders. Our study tries to address this gap by studying how rumination effects both aggressiveness and sleep quality, offering a theoretical underpinning based on General aggressiveness Model. This model indicates that cognitive processes, such as rumination, contribute to the violent behavior by maintaining or magnifying unpleasant feelings and arousal. Moreover, our study addresses gender variations in how rumination promotes aggression, a relatively underexplored issue in literature. By examining these relationships, we seek to establish a more thorough knowledge of the mechanisms via which rumination impacts both sleep as well as violent behavior, potentially yielding new insights for the therapeutic interventions.

Studies have frequently indicated that poor sleep quality corresponds to a range of behavioral problems, including aggression. Sleep disturbance greatly effects mood, cognition, and emotional regulation, leading to violent conduct. The relationship between sleep disorders and aggression may be mediated by poor prefrontal cortex functioning, which hinders psychological regulation, especially management of violent impulses (Kamphuis, 2017). While many researches emphasize the link between sleep quality and aggression, most are correlational, leaving the direction of causality unknown. Studies have revealed that pre-sleep intrusive thoughts are related to lower sleep quality, especially in those with an inclination to ruminate (Guastella & Moulds, 2007). The researchers suggest that ruminating might contribute to lower sleep quality, particularly among high-trait ruminators who feel higher cognitive arousal before bedtime, eventually compromising their sleep experience (Guastella & Moulds, 2017; Morin et al., 2003). Although the research has shown that rumination negatively impacts the sleep quality and that sleep disturbance badly influences aggression, these studies typically do not take an extensive approach to investigate the relationship between rumination and aggression and sleep quality, particularly when it comes to gender differences.

Theoretical Support

Goal Progress Theory

Goal Progress Theory (Martin et al., 1993) describes rumination as a response to perceived failure or dissatisfaction in working toward one's goals, rather than entirely a reaction to emotional states. The rumination functions as an intellectual process that keeps individuals concentrated on their uncovered goals, possibly leading to increased distress and behavioral dysfunction. In the setting of our investigation, theory assists in understanding how unsolved goal-related stress could inspire rumination, which in turn could intensify violent behaviors & violate sleep quality. While idea commonly relates rumination to goal failure, evidence reveals that ruminating may endure even without initial failure experience, suggesting that it is a dynamic, multidimensional process that integrates both cognitive and motivational components. Aggression itself is complicated behavior, typically impacted by biological, psychological, & social factors. While not all aggressive conduct

arises from rumination, connection between the two has become a focus point in understanding how unresolved emotional difficulties can lead to dangerous actions. Aggressive conduct may emerge in the different forms, including verbal insults, physical altercations, or social isolation. This gives a theoretical foundation for examining subtle relationship between rumination, aggression and sleep issues in our study.

Self-Regulatory Executive Function Theory

The Self-Regulatory Executive Function (S-REF) theory (Wells & Matthews, 1994, 1996) gives an extensive framework for understanding rumination within wider context of behavioral disorders. It highlights connection between attentional focus, cognitive regulation, and metacognitive views regarding emotion regulation. According to this view, rumination is a cognitive process that affects how people control their thoughts and emotions and results from false metacognitive ideas. The S-REF model integrates function of metacognitive beliefs considerably, which makes it particularly beneficial for understanding how rumination can induce aggressiveness and interrupt sleep, even when it coincides other categories like concern and disruptive ideas. In this connection, this theory helps us understand how long-term ruminating affects psychological control (such as anger) and physiological results (such irregular sleep patterns) by framing rumination as a multifaceted and complexed entity.

Frustration-Aggression Theory

One of variables in present study, Frustration-Aggression Theory (Dollard et al., 1939; Berkowitz, 1969), presents a basic structure for comprehending relationship between frustration and violent conduct. This idea suggests that frustration results from an individual's goal-directed conduct being obstructed or interfered with. This can cause emotional reactions like anger, which can then result in violent behavior. This technique complies with the theory that rumination may increase feelings of dissatisfaction intensify aggressive inclinations, especially when it entails recurrently thinking negatively about unfulfilled goals or unsolved stressors. According to concept, people may become displaced in aggressiveness and resort to aggressive behavior in other contexts, such interpersonal interactions, if they are unable to channel their dissatisfaction towards source. Despite significant evidence associating sleep disturbance and aggression, fewer studies have explored rumination's involvement as mediator in this association. This model validates present research on the potential for ruminating to increase aggression, especially when anger over unsolved issues keeps mounting. It offers a tool to explore potential effects of anger and rumination on physiological outcomes, like the quality of sleep.

Social Learning Theory

In addition to the frustration-aggression hypothesis, Social Learning Theory (Bandura, 1977) offers an essential framework for understanding the formation and persistence of aggressive behavior. This hypothesis argues that people pick up aggressive conduct by seeing it in others and copying it. People, especially kids, take behavioral clues from what they observe in their surroundings, which may include observing acts of aggressiveness in others, whether in person or through media. This hypothesis explains how aggressive reactions, especially when they are rewarded or not suitably punished, can be perpetuated over time. Accordingly, people who ruminate on unpleasant ideas

on a regular basis may be more likely to notice or remember previous violent reactions and adopt those actions into own behavior, mainly if those actions have previously helped them feel better emotionally or deal with frustration. This theory is vital theoretical starting point for investigating how rumination may lead to learnt reactions to stress and frustration that result in violent behavior as well as poor sleep quality. It also emphasizes the influence of social and environmental factors on behavior formation.

Energy Conservation Theory

According to the Energy Conservation Theory, one of sleep's main purposes is to lower the energy consumption when organism is less effective at tasks, finding food. During sleep, body temperature lowers, and caloric requirements are lowered, preserving crucial energy. Research suggested that animals with faster metabolisms like smaller species sleep longer to recover from excessive energy consumptions lend importance to this notion. The Restorative Theory is concerned with how sleep contributes to the healing and restoration of the body. It suggests that sleep is necessary for protein synthesis, tissue repair, and the release of hormones linked to growth. While REM sleep is crucial for brain recovery and mental performance, non-REM sleep is linked to repair and reconstruction of body tissues. When combined, these concepts highlight vital functions that sleep plays in reserving both physical and mental states, and possible drawbacks of sleep deprivation based on by things like rumination.

Nolen-Hoeksema's Response Styles Theory

Our studies into how ruminating affects aggression and sleep quality is conceptually grounded in a number of basic rumination theories, such as Nolen-Hoeksema's Response Styles Theory (RST). According to RST, rumination is habitual reflection on origins and consequences of one's negative emotions, which increases awareness of upsetting ideas. People may find it difficult to break free from these kinds of ideas as a result of this ongoing focus on unpleasant stimuli, which may harm cognitive resources (Dalgleish & Watts, 1990; Whitmer & Gotlib, 2013). Besides, the incapacity to divert focus from unfavorable ruminations may result in emotional dysregulation, which in turn may cause increased aggression (Whitmer & Banich, 2007). Moreover, our research incorporates elements of the "habits of thought" theory, which postulates that rehearsing unpleasant memories on a regular basis creates cognitive patterns that may serve as attractors for thoughts and feelings in the future (Cramer et al., 2016). We aim to identify that how the rumination-related cognitive processes not only impact sleep but also exacerbate violent tendencies by connecting these ideas to the relationship between aggression, rumination, and sleep quality. Thus, we can address gaps in the existing literature about the interplay of these leading factors and their wider implications for mental health.

Rumination on Sadness Conceptualization

The Rumination on Sadness conceptualization (Conway et al., 2000), which describes rumination as repetitive alleged focused on sadness and its linked situations. This model is particularly relevant because it stresses how persistent negative thought patterns can aggravate emotional discomfort, which in turn may impair other areas of mental and physical health, such as aggressiveness and sleep quality. The model reveals that ruminating, by keeping individuals engaged in a loop of grief,

could disturb emotional regulation, leading to high aggression and poor sleep quality. Although this model especially targets sorrow, its application to broader emotional states, such annoyance or anger, provides a useful foundation for understanding how recurrent negative thoughts might stop sleep and enhance violent actions. Our study intends to elaborate on this notion by studying the links between rumination, aggression, and sleep quality, filling a gap in understanding how these components interact.

Stress-Reactive Model of Rumination

The Stress-Reactive model of rumination indicates that rumination occurs as a response to stressful experiences, especially through recurrent, negative, event-related inferences (Alloy et al., 2000). This model encourages the Response Styles Theory by claiming that ruminating may start before negative affect completely appears, highlighting ruminative behaviors that develop directly after observing a stressor. In the context of our investigation, this model provides a theoretical framework for understanding how stress-induced rumination might alter aggressiveness and sleep quality by sustaining a focus on negative experiences, which could impair emotional control and interrupt restorative sleep. While effective, a disadvantage is that it focuses primarily on the event-related thoughts, potentially ignoring larger themes like self-deprecating thoughts that may affect sleep and aggression.

Post-Event Ruminating Model

The Post-Event ruminating model, derived from social phobia literature, indicates that rumination drives after social gatherings, especially in those with increased social anxiety. This model can be extended to our study in examining how social factors might trigger ruminative thoughts, which in turn effect psychological responses like aggression and sleep problems. While its relevance to social anxiety is obvious, it is questionable if post-event rumination also relates to larger cognitive processes involved in anxiety and depression. This model suggests a potential relationship between social stress, negative mental processes, and the interaction between rumination, aggression, and sleep quality.

Cognitive Emotion Regulation Model

Another theoretical foundation for comprehending rumination as a cognitive emotion regulation approach is provided by the Cognitive Emotion Regulation model (Garnefski et al., 2001), which is quite pertinent to the present research. According to this paradigm, rumination is a component of a larger range of coping mechanisms people employ to control their emotions, including self-blame, catastrophizing, and reappraisal. ruminating can contribute to the emotional dysregulation, which may have negative effects including increased aggression and worse sleep quality. This is made evident when one considers ruminating in the context of emotion regulation. Thus, from this angle, rumination should be examined as part of broader framework of emotion management techniques rather than being studied in isolation. However, as it could distort the measurement of ruminating, the overlap between rumination and other subscales like self-blame should be taken into account. Furthermore, this model supports the notion that rumination and recursive negative thinking may have profound impacts on the mental and physical health, which is in line with the factors in the present study.

RESEARCH METHODOLOGY

Research Approach

The study used quantitative research methodology. The basis of quantitative research is statistical data analysis. To find and study numerical data or information that may be provided as statistical value for better comprehension, a qualitative method is applied. Based on nature of the research's aims and hypothesis, researcher chose this technique. Researcher used cross-sectional study design to evaluate difference amid young adults and middle adults on the basis of rumination, aggression and sleep quality

Sample of Study

Purposive and convenient sampling techniques were employed to collect data for study, involving 300 Pakistani participants, divided into two groups: young adults (n = 221) and middle adults (n = 79), including genders (male: n = 114, female: n = 186). The inclusion criteria required participants aged 17-55 who could understand English, while those outside this age range or without informed consent were excluded. In this connection, a priori power analysis determined a required sample size of 76, but 224 additional respondents were included to account for bias and attrition in current research study.

Measures of Study

This study's demographic questionnaire gathered the crucial background information from the participants. In this regard, the variables include gender, age, educational level, residential area & family system.

Table 1 Frequency and Percentage of Participants (N = 300)

Variable	F	%
Gender		
Male	114	38.0
Female	186	62.0
Education Level		
Undergraduate	62	20.7
Graduate	92	30.7
Masters/ M. Phil	58	19.3
PhD	88	29.3
Family System		
Nuclear	100	33.3
Joint	200	66.7
Residential Area		
Urban	192	64.0
Rural	108	36.0
	Range	M (SD)
Age	17-35, 36-55	24.8 (5.98)

Note: f=Frequency, %=Percentage, M=Mean, S.D =Standard Deviation

Research Instruments

Ruminative Responses Scale (RRS)

The Ruminative Response Scale (RRS) is an enhanced version of original, broader Response Styles Questionnaire, designed specifically to evaluate rumination with greater precision, free from the influence of depression. RRS exhibits strong reliability, with alpha coefficients between 0.74 and 0.83. This scale consists of 22 items that assess two primary characteristics of rumination: brooding & reflective pondering. Participants evaluate each item using four-point scale: 1 (Almost Never), 2 (Sometimes), 3 (Often), 4 (Almost Always). Questionnaire generates scores for Brooding, Reflection, & Depression measures.

Brief Aggression Questionnaire (BAQ)

The Brief Aggression Questionnaire (BAQ) is a 12-item self-report scale designed to examine four components of trait aggression: Anger, Hostility, Verbal Aggression, and Physical Aggression, each represented by three items. BAQ has showed good reliability, with Cronbach's alpha coefficient of 0.81. Respondents assess each item on a 7-point Likert scale, ranging from 1 (Strongly Disagree) to 7 (Strongly Agree).

Pittsburgh Sleep Quality Index (PSQI)

The Pittsburgh Sleep Quality Index (PSQI) is 19-item self-rated questionnaire designed to evaluate sleep quality and disruptions over 1-month period. It consists of 7 components: sleep duration, sleep disturbance, sleep latency, daytime dysfunction, sleep efficiency, sleep quality & sleep medication use. Each component is evaluated from 0 to 3, with higher scores indicating greater dysfunction, while the score runs from 0 to 21. A global PSQI score above 5 separates poor sleepers from good sleepers, with a sensitivity of 89.6% and a specificity of 86.5%. The scale has reliability, with test-retest reliability of 0.92.

Procedure of Study

Initially, consent from the developers of instruments was obtained before using them. An authority letter from psychology department was produced after getting permission to use scale, confirming the researcher's institutional connection. A physical survey was conducted after receiving formal consent. Each item on the scale was given a question, and all participants were asked to respond honestly. Respondents were given explanation of instructions that were provided on questionnaire. If they had any questions, participants were assisted. They received guarantees that the information will be kept private and used only for research. Scale completion was not subject to a time limit. For their assistance and participation throughout study, participants received appreciation. Data was collected from different cities of Punjab province administering rumination, aggression and quality of sleep scales (questionnaires). Participants were asked to complete all Performa's after describing the research purpose.

RESULTS OF STUDY

Table 2 Internal consistency (alpha coefficient) of all scales (N=300)

Scales	k	α
Rumination Response Scale	22	.60
Brief Aggression Questionnaire	12	.70

Pittsburgh Sleep Quality Index	21	.74

Note: k = number of items, α = Cronbach's alpha

Table 3 Descriptive Statistics of all Scales (N=300)

Scales	Items	M	SD	Skewness	Kurtosis
Rumination Response Scale	22	3.24	0.27	-.70	1.69
Brief Aggression Questionnaire	12	4.00	0.90	.20	0.25
Pittsburgh Sleep Quality Index	21	0.95	0.29	.44	-.56

Note: M=Mean, SD=Standard Deviation

Table 4 Correlation matrix of all the variables (N = 300)

SN	Variables	1	2	3
1	Rumination Response Scale (RRS)	--		
2	Brief Aggression Questionnaire (BAQ)	.29**	--	
3	Pittsburgh Sleep Quality Index (PSQI)	-.08	-.04	

The inter-correlation of all scales is shown in table 1. The Rumination is significantly positively correlated with Aggression ($r = .295^{**}$) and non-significantly but negatively correlated with sleep quality ($r = -.088$), whereas Aggression is non-significantly but negatively correlated with quality of sleep ($r = -.042$). Thus, hypothesis 1 that is there is a positive correlation between rumination and aggression is accepted. The hypothesis 2 is accepted that rumination is negatively correlated with sleep quality.

Table 5 Linear Regression analysis for Predictor of Aggression and Sleep Quality

Predictor	Criterion	B (Coefficient	t	Sig	R Square
Rumination (RRS)	Aggression	.29	5.33	< .001	.087
	Sleep Quality	-.08	-1.53	< .001	.008

(N=300)

The results of table shows that rumination ($\beta = .295^{***}$, $t = 5.33$, $^{***}p < .001$), is positively significant predictor of aggression and 8% variance is contributed by rumination ($R2 = .087$). Analyses of the present study demonstrate that rumination is positive significant predictor of aggression. The result also shows that rumination ($\beta = -.088$, $t = -1.531$, $^{**}p < .01$), is negative non-significant predictor of sleep quality and 0 % variance is contributed by rumination ($R2 = .008$). Rumination is negative non-significant predictor of sleep quality. Thus, hypothesis 3 show that rumination significantly predict aggression is accepted while results show that rumination is negative non-significant predictor of sleep quality.

Table 6 Independent Sample T-Test to Analyze Gender Differences

Variables	M	SD	M	SD	T (98)	P	LL	UL
Rumination	3.60	.391	3.6	.315	-.592	.55	-.1054	.0566
Aggression	4.03	.950	0.03	.820	.019	.98	-.2095	.2063
Sleep Quality	.930	.297	1.00	.295	1.99	.04	-.0010	.1398

Table 6 shows mean and standard deviation of male and female students on rumination, aggression, sleep quality. The analysis revealed no significant gender differences in rumination and aggression, indicating that these traits are relatively consistent across genders. There was significant difference in sleep quality, suggesting gender may play a role in influencing how individuals experience and report quality of sleep.

Table 7 Independent Sample T-Test was used to analyze the Age Differences

Variables	M	SD	M	SD	T (98)	P	LL	UL
Rumination	3.24	.290	3.23	.241	-.497	.62	-.1671	.0566
Aggression	4.09	.887	3.86	.926	1.90	.59	-.0091	.4660
Sleep Quality	.934	.285	1.02	.324	-2.07	.04	-1.412	.0039

Table 7 indicates mean and standard deviation of young adults and middle adults on rumination, aggression and sleep quality. In this linking, the analysis found no significant age differences in rumination, suggesting that the repetitive negative thinking remains the stable across age groups. Still, significant differences were observed in aggression and sleep quality, indicating that these factors may vary depending on age, with different age groups experiencing aggression and sleep quality differently.

DISCUSSION

This study is designed to investigate the relationship between rumination, aggression, and sleep quality, while also examining the influence of demographic factors such as gender and age. The measures used in the study exhibited good internal consistency, confirming their applicability to the Pakistani population. The Pearson correlation analysis provided an initial understanding of the relationships amid variables, with significant correlations observed, which were further analyzed using linear regression. Moreover, cognitive arousal, such as rumination, has been recognized as an important aspect that disturbs sleep. The existing literature shows strong link between rumination, sleep quality, and aggression, while gaps remain in explaining the connection of these variables properly. The first hypothesis, that is, rumination is significantly related towards aggression, was supported by the results. This aligns with previous research (Bushman, 2002; Bushman et al., 2005; Denson et al., 2006), which has shown that increased rumination leads to heightened aggression. The second hypothesis posited the negative relationship between rumination and sleep quality, which was found to be weak and non-significant. Previous studies (Guastella et al., 2007) have suggested that rumination after stressful events can negatively impact sleep quality in individuals predisposed to ruminate.

However, the weak relationship observed in this study could be attributed to cultural influences, individual differences in the rumination tendencies, and gender variations. The third hypothesis examined the predictability of aggression and sleep quality based on rumination. The results partially supported this, showing that rumination significantly predicts aggression, consistent with previous findings (Maya et al., 2010). In this linking, this suggests that rumination and aggression have a bidirectional relationship, with one reinforcing the other. Regarding gender differences, the analysis showed no significant differences in rumination and aggression between the males and

females, but significant differences were found in sleep quality. Males reported better sleep quality than females, possibly due to the cultural factors affecting sleep patterns and routines. The final hypothesis explored age differences between young and middle-aged adults. While no significant differences were found in rumination, young adults displayed higher levels of aggression compared to middle adults. Interestingly, sleep quality was also higher in young adults, which may again be influenced by cultural factors. These findings contribute to the understanding of how rumination impacts the aggression as well as sleep, with the demographic variables playing a nuanced role in these relationships.

CONCLUSION

The analyses indicate sufficient internal consistency for all study variables. The sample consisted of 300 participants, divided into male (n = 114) and female (n = 186) students. The results demonstrate a positive correlation between rumination and aggression, suggesting that as rumination increases, aggression also increases. Additionally, rumination was found to be negatively correlated with sleep quality, indicating that higher levels of rumination lead to poorer sleep quality, & vice versa. The findings also reveal that rumination positively predicts aggression, showing a direct influence on aggressive behavior. The gender analysis showed no significant differences in rumination and aggression between males and females. However, males reported higher levels of sleep quality compared to females. In terms of age differences, young adults exhibited higher scores for both aggression and sleep quality compared to middle-aged adults. However, there were no significant age differences in the rumination between the two groups as evident from the results of current research study.

Limitations

This study, while offering the useful insights, has specific shortcomings that require attention. The sample size was comparatively limited, potentially impacting the generalizability of the results to a wider population. The study also depended on self-reported measures, which may be influenced by social desirability bias or inaccurate self-evaluation. The cross-sectional design of the study restricts the capacity to infer causal correlations among rumination, aggression, and sleep quality. Also, the study failed to consider specific demographic factors, such financial status, marital status, or cultural influences, that could significantly impact the relationship amid rumination, aggression, and sleep.

Future Suggestions

The future studies should adopt a mixed-method approach, incorporating qualitative methods to explore the cause and effect of rumination more comprehensively. The longitudinal studies are recommended to examine how rumination impacts forgiveness and marital satisfaction. Larger sample sizes should be considered in future research to gather more substantial and authentic data, thereby improving external validity and generalizability of the findings. Multiple data collection methods, such as personal interviews or advanced tools, should be used to reduce the influence of socially desirable responses. A more diverse sample, obtained through random selection, should be included in the future studies to enhance the representativeness. In this regard, the additional

demographic variables, such as marital status and socioeconomic status, should be included to provide a more detailed understanding of the relationships between these factors and the variables under study.

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