

# Relationship Between Dissociative Experiences, Abnormal Sleep Experiences, and Sleep Quality in Undergraduate Students

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## ÖZET

Üniversite öğrencilerinde disosiyatif deneyimler, anormal uyku deneyimleri ve uyku kalitesi ilişkisi

**Amaç:** Üniversite öğrencilerinde disosiyatif deneyimler, uyku deneyimleri ve uyku kalitesi arasındaki ilişkiyi araştırmaktır.

**Yöntem:** Çalışmaya 127 üniversite öğrencisi alındı. Katılımcılara, Disosiyatif Yaşantılar Ölçeği (DES), Iowa Uyku Deneyimleri Ölçeği (ISES) ve Pittsburg Uyku Kalitesi İndeksi (PUKİ) uygulandı.

**Bulgular:** DES toplam ve DES Taxon puanları ile ISES toplam, ISES genel uyku deneyimleri alt ölçekleri arasında orta düzeyde ilişki bulundu. PUKİ uyku bozuklukları, uyku ilacı kullanma, gün içi disfonksiyon alt ölçek ortalamaları ve toplam puan ortalamaları ile ISES toplam ve genel uyku deneyimleri alt ölçek puanları arasında zayıf ilişki bulundu. Regresyon analizi sonucunda, DES toplam puanlarının genel uyku deneyimlerini büyük ölçüde ön gördüğü, bunun yanında PUKİ uyku bozuklukları alt ölçek ortalamalarının ISES genel uyku deneyimleri ile ilişki olduğu bulundu.

**Sonuç:** Bu çalışmada disosiyatif deneyimler ve anormal uyku deneyimleri arasında anlamlı ilişki bulunmuş, bunun yanında uyku problemleri gibi uyku kalitesi ile ilişkili bazı değişkenlerin disosiyatif deneyimler ve genel uyku deneyimleri ile ilişkili olduğu görülmüştür.

**Anahtar kelimeler:** Uyku, uyku kalitesi, disosiyasyon, rüya

## ABSTRACT

Relationship between dissociative experiences, abnormal sleep experiences, and sleep quality in undergraduate students

**Objective:** To investigate the association between dissociative experiences, sleep related experiences and sleep quality.

**Method:** 127 undergraduate students have completed the Dissociative Experiences Scale (DES), the Iowa Sleep Experiences Scales (ISES) and the Pittsburg Sleep Quality Index (PSQI).

**Results:** DES total and DES Taxon scores were moderately correlated with total ISES and ISES General Sleep Experiences (GS) subscale scores. PSQI total scores as well as the scores from PSQI subscales of sleep disturbances, use of sleeping medication and daytime dysfunction were weakly correlated with total ISES and ISES GS subscale scores. DES and PSQI total and subscale scores were not correlated with the lucid dreaming (LD) subscale of ISES. DES total scores explained a considerable amount of variance in ISES GS scores. Sleep disturbances and use of sleeping medication as indicators of sleep problems, were related to ISES GS.

**Conclusions:** The present study showed the association between dissociative experiences and nighttime experiences and further revealed that some aspects of general sleep quality, especially the ones related to sleep problems are also related to both dissociation and general sleep experiences.

**Key words:** Sleep, dissociation, sleep quality, dream

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## INTRODUCTION

Pathological forms of dissociation involve a disruption in the usually integrated functions of consciousness, memory, identity and perception (1, 2).

Sleep Related Experiences (SREs) include a variety of nocturnal altered-consciousness phenomena, such

as nightmares, dreams with narcoleptic characteristics, recurring dreams, dream recall, vivid dreams, problem-solving dreams, dreams confused with reality, and lucid dreams (3,4). People suffering from nightmares report an overall richness in their dream life and are more likely to be affected by their dreams the following day (5-7). Several studies have reported a positive association

between frequency of nightmares and dissociative disorders, schizophrenia, and PTSD (8,9). A recent study by Agargun et al. (9) compared the dissociative and traumatic experiences of the subjects with vs. without nightmares and found that the nightmare group scored significantly higher in dissociation and had a higher rate of childhood traumatic experiences. In another study, more than half of the subjects with dissociative disorders also had a diagnosis of nightmare disorder (8).

It has been argued that dissociative symptoms of derealization, depersonalization and amnesia, along with SREs belong to a common domain characterized by unusual and intense forms of cognition and perception (4,10). Watson reported a positive association between self-reported measures of SREs and dissociative experiences in 2 different studies. In these studies, SREs have been measured with Iowa Sleep Experiences Scale (ISES) (4,10) and dissociative experiences were measured with the well-validated Dissociative Experiences Scale (DES) (11). ISES is a self-report questionnaire measuring general sleep experiences and lucid dreaming. Association of ISES, particularly ISES General Sleep Experiences scale with dissociative experiences and schizotypy have been reported in several studies, mainly with non-clinical populations (10,12-15).

The present study considers the role of sleep quality and its relation to unusual sleep experiences and dissociation. Sleep quality seems to be inherently linked to night time experiences. Additionally, previous literature suggests a positive association between sleep quality and general psychopathology (16,17). However, the role of general sleep quality in the context of the overlap between day-time experiences of dissociation and the night-time experiences has not been analysed in any study. Based on previous findings, we hypothesized that high level of dissociative symptoms would be associated with impairment of sleep quality.

Furthermore, we considered the predictive value of dissociative symptoms and of general sleep quality on general sleep experiences. To investigate the hypothesized relations, self-report measures of

dissociation, general sleep experiences and general sleep quality have been used in a Turkish undergraduate sample.

## METHOD

### Participants

Participants were 127 undergraduate students recruited from Boğaziçi University. The only exclusion criteria was a history of psychiatric complaint in the last 6 month. After the study protocol was thoroughly explained, informed consents were obtained from the participants. Sixty-seven (53%) of the participants were females and 60 (47%) of them were males, general mean age was 23.07 years (SD=2.12; range: 10).

### Measures

#### Dissociative Experiences Scale (DES):

The DES is a self-report scale asking respondents to indicate the extent to which they experience 28 dissociative phenomena in daily life on 100 mm visual-analog scales. Examples of such phenomena include feelings of depersonalization, derealization, and psychogenic amnesia. A subset of eight DES items forms the Dissociative Experiences Scale Taxon (DES-T) (18) which is thought to be especially sensitive to pathological dissociation. DES-T scores can be obtained by averaging across the DES items 3, 5, 7, 8, 12, 13, 22, and 27.

The DES has adequate validity and reliability in both normal and clinical samples (19). The Turkish version of the scale has satisfactory reliability and validity with indices comparable to its original form (20,21).

**Iowa Sleep Experiences Scale (ISES):** The ISES (4,10) consists of 18 questions asking the respondent to rate the frequency of various sleep- and dream-related experiences (e.g., “A dream helped me to solve a current problem or concern.”, “Lying in bed, I sense the presence of someone who actually isn’t there.”) on a 7 point-Likert scale (anchors: 1= never; 7=

several times a week). The ISES contains two separate subscales that measure general sleep experiences (GSE, 15 items; Cronbach's  $\alpha = 0.81$ ) and lucid dreaming (LD, 3 items; Cronbach's  $\alpha = 0.77$ ), respectively. These subscales show a moderate correlation with correlation coefficients around 0.40, indicating that they measure distinct, but related constructs (4). A mean score can be obtained by averaging across all items.

The ISES is the only reliable and valid measure of the wide range of nocturnal altered-consciousness experiences. However, the validity and reliability of this scale were not established for the Turkish version. The ISES is translated to Turkish by the authors. Cronbach's alpha was 0.87 for ISES total score, 0.86 for GSE and 0.83 for LD in this study. Finally, for the present sample, Kaiser Meyer Olkin measure of sampling adequacy was 0.83.

**Translation of the ISES:** The repeated forward-backward translation procedure was adopted as it is most commonly quoted in the adaptation and translation process (22). In this procedure, a forward translation is made from the source original language to the target new language. The target language version is then translated back into the source language and compared to the original version. Errors in the target language version are identified through changes in meaning that arise in the back translation. The procedure was broadly divided into four phases. Phase 1 was to make four Turkish translated versions of the original scale and unify these four. Phase 2 was to produce a back-translated version. Phase 3 was to check the equivalence between the original scale and the back-translated version. Phase 4 was to continue forward and backward translation until satisfactory equivalence was agreed.

**Pittsburgh Sleep Quality Index (PSQI):** The PSQI which is an instrument with previously established reliability and validity (23), was administered to assess sleep quality during the previous month. Turkish version of the the PSQI was validated by Agargün et al. (24). The PSQI consists of 19 self-rated questions. These 19 items are grouped into seven component scores, each

weighted equally on a 0-3 scale. The components are subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbance, use of sleeping medications, and daytime dysfunction. The seven component scores are then summed to yield a global PSQI score, which has a range of 0-21; higher scores indicate worse sleep quality.

## Statistical Methods

The statistical package SPSS 18 for Mac was used for all analyses. Correlation analyses (Pearson, bivariate) between the ISES and DES and PSQI were performed. In order to examine the predictive value of dissociation and general sleep quality on general sleep experiences, stepwise regression were performed between ISES general sleep scores as the dependent variable and DES total, PSQI subscales, and age as predictor variables. Age was entered in the first step in order to accommodate the effects of this extraneous variable. In the second step, the DES scores were entered and, in the final step, seven dimensions of the PSQI were included to the analysis. For all statistical analysis p values were two-tailed and differences were considered significant at  $p < 0.05$ .

## RESULTS

Mean DES total scores were 12.12 (SD=9.25), PSQI global scores were 7.89 (SD=2.36), and ISES total scores were 2.29 (SD=0.80). The mean DES score complied with values that previous studies reported for student samples (25). Table 1 shows subscale and total score means of the DES, PSQI and ISES (Table 1).

Table 2 presents Pearson correlations between DES, ISES and PSQI subscales and total scores. Total scores of the DES and the DES-T scores were moderately correlated with total ISES and the ISES GS subscale scores. Correlations varied between 0.48 to 0.57,  $p < 0.001$ . PSQI total scores as well as the scores from PSQI subscales of sleep disturbances, use of sleeping medication and daytime dysfunction were weakly correlated with total ISES scores and ISES general sleep experiences subscale scores. Correlations varied

**Table 1: Mean and standard deviations of the total ISES, DES, PSQI and their subscale scores**

Scales	Minimum	Maximum	Mean	S.D.
ISES GS	1.20	6.80	3.00	1.04
ISES LD	1	7	2.63	1.46
ISES	0.94	5.28	2.29	0.80
DES-T	0	46.25	7.56	8.60
DES Total	0.36	41.43	12.12	9.25
PSQI-1: Subjective Sleep Quality	0	2	0.07	0.34
PSQI-2: Sleep Latency	0	3	1.04	0.81
PSQI-3: Sleep Duration	0	3	0.58	0.63
PSQI-4: Habitual Sleep Efficiency	0	3	2.74	0.79
PSQI-5: Sleep Disturbances	0	2	1.11	0.39
PSQI-6: Use of Sleeping Medication	0	3	0.88	0.88
PSQI-7: Daytime Dysfunction	0	3	0.98	0.81
Global PSQI	1	15	7.89	2.36

ISES, Iowa Sleep Experiences Scale; ISES GS, Iowa Sleep Experiences Scale General Sleep Experiences; ISES LD, Iowa Sleep Experiences Scale Lucid Dreaming; DES, Dissociative Experiences Scale; DES-T, DES-Taxon; PSQI, Pittsburg Sleep Quality Index

**Table 2: Correlations between total ISES, DES, PSQI and their subscale scores**

		ISES	ISESGS	ISESLD	DES Total	DES-T
ISES GS	r	0.992***				
ISES LD	r	0.392***	0.396***			
DES Total	r	0.568***	0.559***	0.081		
DES-T	r	0.491***	0.485***	0.049	0.873**	
PSQI-1: Subjective Sleep Quality	r	0.026	0.023	0.051	0.104	0.171
PSQI-2: Sleep Latency	r	0.093	0.084	-0.052	0.082	0.082
PSQI-3: Sleep Duration	r	0.127	0.110	0.067	0.094	-0.015
PSQI-4: Habitual Sleep Efficiency	r	0.006	-0.003	0.014	0.027	0.017
PSQI-5: Sleep Disturbances	r	0.346**	0.340***	0.061	0.242**	0.187*
PSQI-6: Use of Sleeping Medication	r	0.277**	0.285**	0.004	0.235**	0.154
PSQI-7: Daytime Dysfunction	r	0.218*	0.230**	0.128	0.235**	0.180*
Global PSQI	r	0.331***	0.330***	0.052	0.290**	0.209*

Correlation is significant at the \*0.05 level, \*\*0.01 level and \*\*\*0.001 level (2-tailed).

ISES, Iowa Sleep Experiences Scale; ISES GS, Iowa Sleep Experiences Scale General Sleep Experiences; ISES LD, Iowa Sleep Experiences Scale Lucid Dreaming; DES, Dissociative Experiences Scale; DES-T, DES-Taxon; PSQI, Pittsburg Sleep Quality Index

from 0.22 to 0.35,  $p < 0.05$ . On the other hand, DES total scores and PSQI total and subscale scores were not correlated with the lucid dreaming subscale of the ISES, implying that the correlations in the total scores were mainly derived by the general sleep experiences subscale (Table 2).

DES total scores were weakly correlated with the total PSQI scores ( $r=0.29$ ,  $p < 0.05$ ) and with the scores from PSQI subscales of sleep disturbances, use of medication and day time dysfunction. The results were similar to DES total scores for DES-T scores except for the fact that DES-T scores were not significantly related to the use of sleeping medication subscale of PSQI. Correlations varied from 0.18 to 0.29,  $p < 0.05$  (Table 2).

In order to examine the predictive value of

dissociation and general sleep quality on general sleep experiences, stepwise regression were performed between ISES general sleep scores as the dependent variable and DES total, PSQI subscales, and age as predictor variables. Age was entered in the first step in order to accommodate the effects of this extraneous variable. In the second step, The DES scores were entered and, in the final step, seven dimensions of the PSQI were included to the analysis. The stepwise regression conducted with maximum likelihood method revealed that PSQI sleep disturbances and DES total scores were significant predictors of general sleep experiences and together these accounted for 34% of the variance in general sleep experiences subscale of ISES (Table 3).

**Table 3: Regression results where the dependent variable is Iowa Sleep Experiences Scale General Sleep Experiences subscale score**

Model		B	Std. Error	Beta	t	p
1	Constant	2.238	0.129		17.320	<0.001
	DES Total	0.063	0.008	0.560	7.500	<0.001
2	Constant	1.659	0.236		7.026	<0.001
	DES Total	0.058	0.008	0.508	6.789	<0.001
	PSQI- 5: Sleep Disturbances	0.581	0.201	0.216	2.890	0.005

Model 1: F=56.25, SD=1.123, Adjusted R<sup>2</sup> = 0.308

Model 2: F=33.984, SD=2.122, Adjusted R<sup>2</sup> = 0.347

## DISCUSSION

In the present study we found significant positive correlations between ISES, ISES general sleep experiences, DES-T and DES total. No association was found between lucid dreaming and DES total scores. Furthermore, we examined the relationship between general sleep quality (e.g. sleep duration, latency, disturbances, efficiency etc.), dissociative experiences and SREs. We found that some indices of sleeping problems like sleep disturbances, use of sleeping medication and day time dysfunction due to sleeping problems, were positively associated both with dissociation and general sleep experiences. However, subjective sleep quality, sleep latency and duration, as well as habitual sleep efficiency scores were not significantly associated neither with DES scores nor with ISES scores (see Table 2). The regression analyses revealed that DES total scores explained a considerable amount of variance in general sleep experiences. Sleep disturbances (with DES total scores) were related to ISES General Sleep Experiences (see Table 3).

Most of the researchs examining the overlap of SREs and dissociation have been conducted using the ISES (3,4). Several studies have found that the DES correlates significantly with the ISES General Sleep Experiences scale, but not with the ISES Lucid Dreaming scale (12-14). Similar findings were obtained in the present study (4,10,13,15).

Three views have been put forward to explain the overlap between dissociative experiences and sleep related experiences: The first view explains this overlap by abnormalities of the sleep-wake cycle. According to this view, errors or overlaps that occur during the shift from sleep to wakefulness (or vice versa) cause

a blurring of the boundaries between these states and underlies the overlap between daytime and nighttime experiences (26). To explain the association between sleep-related experiences and dissociation, Watson (4), on the basis of his finding, speculated that dissociative symptoms might be enhanced by labile sleep-wake cycles, given that individuals with these symptoms easily pass from normal waking mentation state to dream-like states. It has also been hypothesized that individuals who are prone to dissociation have an inherited or acquired hypersensitivity of the cholinergic system that allows them to easily shift from waking to dreamlike states (27).

The second view emphasizes the role of stress and trauma. Traumatic experiences are known to disrupt both daytime and nighttime experiences since trauma usually triggers day time dissociations, i.e. flashbacks and sleep disturbances such as nightmares (28,29). Nightmares are also positively associated with personality disorders (6), schizotypy (30), dissociative disorders (8) and acute and posttraumatic stress disorders (31). Recently, Agargun et al. (9) examined the relationship of nightmares to dissociative experiences in a large group of adolescents, and demonstrated a relationship between dream anxiety, dissociative experiences and causal role of childhood traumatic events in this relationship.

The final view highlights the importance of underlying personality traits. More specifically, absorption and fantasy proneness are found to be the main aspects of personality that have been found to be related to the overlap between day-time and night-time experiences (12,15). In a recent publication, Koffel and Watson (3) reviewed the evidence for all three models and concluded that any comprehensive theory of

daytime and nighttime symptoms will most likely need to invoke aspects of all three models. Furthermore, they argue that the overlap between unusual sleep experiences, schizotypy and dissociation is underlied by a common domain referred to as “unusual cognitions and perceptions”. However, previous studies reporting a relationship between dissociative tendencies and schizotypy (32) have limitations. First, multidimensionality of both constructs schizotypy and dissociation does not seem to be considered. A second limitation is that these studies overlooked the possibility that dissociation-schizotypy association is spurious. More specifically, the apparent association could be an artifact of each of these variables’ relationship to a third factor such as history of childhood trauma (32). Another limitation is about the conceptual clarity of dissociation. Previous findings suggest that absorption should be differentiated from dissociation. The term dissociation is used to indicate not only ‘true’ dissociative symptoms, e.g. dissociative amnesia, but also encompasses non-dissociative phenomena, such as absorption. Phenomena such as absorption, spaciness, daydreaming, imaginative involvement, altered time sense and trance-like behaviour represent alterations in consciousness. It is not clear whether these alterations can be adaptive or maladaptive (33). Maladaptive alterations in consciousness are not only pervasive in trauma-related disorders, but also in many other mental disorders (34). Nevertheless, most authors regard these alterations as dissociative phenomena (3,4,10). Manifestations of retraction of the field and lowering of the level of consciousness have been defined as ‘dissociation of context’ (35) or ‘dissociative detachment’ (36). However, temporary loss of concentration, shifts in attentional focus and other alterations of consciousness, do not in themselves imply the existence of dissociative parts of the personality, that is, structural dissociation (33).

Previous studies do not take into account the effect of sleep quality on the association between nightmares and dissociation. However, sleep experiences, such as nightmares, may be observed also in other psychopathologies. For example, the diagnostic criteria for Posttraumatic Stress Disorders (PTSD) include nightmares

(1). Nightmares typically arise from REM sleep (37,38). There are studies that found REM fragmentations in PTSD patients which suggests increased noradrenergic activity during REM sleep (39,40). There are some possible neurophysiological hypotheses for explaining dreaming, but it is likely that multiple neurochemical systems are involved in dreaming (41).

The results of our study showed that ISES general sleep scores and DES total scores are correlated with the total PSQI scores, the scores from PSQI subscales of sleep disturbances, use of medication and day time dysfunction. The regression analyses revealed that DES total scores explain a considerable amount of variance in general sleep experiences. Sleep disturbances (with DES total scores) as indicators of sleeping problems, were related to ISES General Sleep Experiences. These findings suggest that, sleep disturbances effect the relation between dissociative experiences and SREs. Sleep disturbances can lead to neurophysiological changes in REM sleep, which, in turn, may cause changes in dream contexts. And, sleep problems, particularly those involving REM period, can cause disruptions in memory and consciousness during wakefulness.

Here, we aimed at analyzing the effect of sleep quality on the association between SREs and dissociative experiences. The study revealed that some aspects of general sleep quality, especially the ones related to sleep problems, are positively associated with both dissociation and general sleep experiences. Regression analyses revealed that DES total and general sleep problems significantly predicted general sleep experiences subscale of ISES. Our findings lead to the conclusion that sleep disturbances, but not the general sleep characteristics (like sleep duration, or latency), are associated with dissociation and SREs.

The present study has several limitations. First, the role of personality traits like schizotypy was not considered. Watson (4) suggested that the mechanism underlying the association between SREs and dissociative tendencies might be a personality trait and provided evidence that SREs are related to schizotypy. A second limitation of the study is that it does not take into account the role of stress and previous trauma.

Childhood trauma, particularly child maltreatment, has been repeatedly shown to be associated with dissociation (42-44), and therefore might be associated with SREs as well (45). Future studies of the SREs should also consider the role of stress and trauma. Another limitation of the present study is that the study is mainly based on self-report questionnaires from a

non-clinical sample. Future research on the topic with clinical samples would improve the existing knowledge on the topic. Finally, one should be careful to interpret the present findings in the sense that the conclusions drawn from the present study are mainly correlational, and any generalization on the causal mechanisms is not warranted.

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