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Talero-Gutierrez, Claudia; Duran-Torres, Felipe; Ibañez-Pinilla, Milciades; Perez-Olmos, Isabel; Echeverria-Palacio, Carlos Mario
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Sleep quality perception and romantic relationships in university students: cross-sectional study

Percepción de calidad de sueño en jóvenes universitarios y relaciones románticas: estudio de corte transversal

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Claudia Talero-Gutierrez¹ • Felipe Duran-Torres¹ • Milciades Ibañez-Pinilla¹ • Isabel Perez-Olmos¹ • Carlos Mario Echeverria-Palacio^{1,2}¹ Universidad del Rosario - School of Medicine and Health Sciences - Neuroscience Research Group (NEUROS) - Bogotá D.C. - Colombia.² Universidad Nacional de Colombia - Bogotá Campus- Faculty of Medicine - Neuroped UNAL Research Group - Bogotá D.C. - Colombia.Corresponding author: Claudia Talero-Gutiérrez. Neuroscience Research Group, School of Medicine and Health Sciences, Universidad del Rosario. Carrera 24 No. 63C-74. Telephone number: +57 1 2970200, ext.: 3325. Bogotá D.C. Colombia. Email: claudia.talero@urosario.edu.co.

| Abstract |

Introduction: Sleep in adolescence is influenced by emotional states triggered by romantic relationships, which can be determinant in sleep quality perception.

Objective: This study was designed to assess the association between sleep quality perception and romantic relationships, as well as its characteristics in late adolescent/young adult university students.

Materials and methods: A cross sectional study was conducted in 443 subjects. Sleep quality perception was quantified using a validated diary for young persons. Individual attachment style, romantic relationship status and its characteristics were determined using specific validated measures.

Results: Sleep quality perception was determined using five multivariate models that included statistically significant characteristics of romantic relationships. Higher sleep quality perception was associated with the level of satisfaction of a subject with the relationship and liking for the partner ($p=0.035$). The prevalence of romantic relationships in students was 64% (95%CI: 59.4-68.9). The individuals that were not in a romantic relationship experienced significantly prolonged sleep latency ($p<0.05$).

Conclusion: Higher sleep quality perception in university students is associated with being in a romantic relationship and the attachment style. These aspects can be identified and intervened, if support systems of educational institutions recognize their potential importance for health, wellbeing and academic performance.

Keywords: Young Adult; Adolescent; Students; Object Attachment; Love; Sleep (MeSH).

| Resumen |

Introducción. El sueño en adolescentes está influenciado de manera especial por los estados emocionales presentes en las relaciones románticas. Esto puede ser determinante en la percepción de calidad del sueño.

Objetivo. Evaluar la asociación entre la percepción de la calidad del sueño y las características de las relaciones románticas en estudiantes universitarios adolescentes y adultos jóvenes.

Materiales y métodos. Estudio de corte transversal realizado en 443 sujetos. La percepción de calidad del sueño, los estilos de apego, estar en una relación romántica y sus características se determinaron utilizando medidas validadas.

Resultados. La percepción de calidad del sueño se determinó utilizando cinco modelos multivariados que incluyeron características estadísticamente significativas de las relaciones románticas. El nivel de satisfacción del individuo con su relación de pareja y la atracción hacia esta se asoció con su nivel de percepción de calidad del sueño ($p=0.035$). La prevalencia de las relaciones románticas fue del 64% (IC95%: 59.4-68.9). Los que no estaban en una relación experimentaron latencia del sueño significativamente más prolongada ($p<0.05$).

Conclusión. Las relaciones sentimentales románticas y sus características se asocian con la calidad de sueño percibida por los individuos. Estos aspectos pueden ser identificados e intervenidos y ser útiles para los sistemas de apoyo de las instituciones educativas.

Palabras clave: Adulto joven; Adolescente; Amor; Sueño (DeCS).

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Introduction

Adolescence is the period of life between 10 and 20 years of age when transition from infancy to adulthood occurs (1,2). However, adolescence nowadays is prolonged by earlier puberty and a long-lasting phase of social dependence, including young adults who are university students (3).

During adolescence, sleep presents fluctuations manifested as a delay in the initiation of nocturnal sleep, daytime somnolence, and nocturnal hypersomnia or as a reduction in the number of hours required daily until the adulthood pattern is established (4-7), and is influenced by psychological factors (1,8,9). Affective states like sadness, anxiety and obsessive behaviors observed in some affective disorders, have an impact on sleep habits and could generate insomnia (8). Additionally, joyousness and euphoria tend to improve the perception of sleep quality (1,9,10). These processes occur at a narrow margin between physiology and pathology (1,9,10). The incidence of sleep disorders reaches a peak during the university phase in adolescents since 25-60% of this population may be affected (11-15), with consequences for daily performance, especially in the academic field (6,10).

Another state that could influence sleep quality perception is romantic love, a very important issue for psychosexual and social relationships in adolescence (1). Romantic relationships support the integration of social groups and enhance individual self-esteem (9,16,17). About 70% of late adolescents have experienced a romantic relationship, though this proportion varies according to the consulted source (1).

The association between sleep quality perception and relationship status in young people has been studied specially by Brand *et al.* Their studies have shown an association between romantic love and hypomanic states, in which euphoric symptoms are related to better sleep quality perception, and negative emotions, as depression and anxiety, with a worse sleep quality (9,18-22).

The aim of this study is to analyze the association between romantic relationships and sleep quality in a university student population of Latin-America. Our hypothesis is that some features of romantic relationships, such as the level of satisfaction, attachment style, presence of obsessive traits and liking for the partner, influence sleep quality perception.

Methods

Study design: This is a cross-sectional study aimed at evaluating sleep quality perception. Its association with romantic relationship status, as well as its characteristics, were determined.

Population and sample: The target population comprised 1 794 undergraduate students from a health sciences school. The selection criteria included students of the Medicine and Health Sciences School from Universidad del Rosario, both sexes, in late adolescence (18-20 years of age), and young adults (between 21-25 years of age), that accepted to participate voluntarily after being informed about the project.

A stratified, probabilistic, randomized sample was used with proportional assignment according to academic program and sex, so that the students in each stratum had the same probability of being selected. This was accomplished using the random selection tool of the SPSS 20 program. The sample size was estimated based on an expected prevalence of relationships of 70% (1), 4% precision, and 95% confidence interval; it was adjusted to 10% of non-participation, requiring 434 students. In total, 443 participants were included.

Exclusion criteria included having a sleep disorder diagnosis, such as dyssomnia and parasomnia (23), or taking any medication that alters the circadian rhythm (24). No subject was excluded for these reasons. The participants that did not complete the sleep questionnaire, or that did not fill it out correctly, were excluded (14%).

Instruments for collecting information: Two instruments were used. The following descriptions account for the questions related to the first instrument:

Question 1: Inquiry about diurnal somnolence. Adapted from The Pittsburgh Sleep Quality Index (25) validated for Colombia.

Questions 2-4: Individual characterization of romantic relationships. The student responded whether he/she was in a relationship, how many previous relationships they had had, and how long was the last one.

Questions 5-30: Adapted from the Loving and Liking scale (26). The scale is made up of 26 items divided in two sections. The first section evaluates the "loving" component, while the second evaluates "liking" from an individual perspective. This instrument uses a Likert type scoring ranging from 1 - "Completely Disagree" to 9 - "Completely Agree." This score has not been validated in Spanish, and its adaptation to a Colombian context was carried out by the research group during a pilot study on a similar population that is not involved in this study.

Questions 31-37: Adapted from the Relationship Assessment Scale (RAS) (27). This scale has seven items that are scored using a Likert scale ranging from 1 - "Not at all" to 5 - "Very much", thus assessing the general satisfaction with a relationship from an individual perspective. This instrument has been validated in Spanish (28).

Questions 38-40: To identify obsessive traits (9,29), three questions were adapted from the Y-BOCS (Yale Brown Obsessive Compulsive Scale) questionnaire, which has been validated in Spanish (30). Scores were obtained using a Likert scale — for example, "how much time do you spend thinking of your love partner, with a scale between 1 - "Almost none" to 4 - "Almost all the time".

Questions 41-49: Adapted from Assessment of Adults' Attachment Styles (31). Nine items were scored using a Likert scale ranging from 1 - "almost never" to 5 - "almost always". They evaluated secure, dismissing, preoccupied, and fearful attachment styles in romantic relationships based on Bartholomew's attachment styles (32).

The second instrument was a sleep diary, which was based on the perception of sleep quality in young people questionnaire called "Subjective questionnaire regarding sleep quality perception, Mexico – Colombia 2005-2006" (33). The diary recorded the number of days, which were increased to seven to complete a week.

In the first section, the participant had to record the frequency of use of alcohol, cigarettes, energy drinks, marijuana, cocaine and other psychoactive substances during the seven days of observation. Afterwards, quantitative aspects of sleep habits were addressed, including number of hours slept, hours required to feel rested upon waking up, sleep latency, as well as naps taken the day before, whether accompanied by nocturnal sleeping, and frequency of sexual activity.

Sleep quality was assessed based on twenty questions scored with the Likert scale ranging from 1-"No" to 5-"Yes", grouped in "good sleep" (GS), "bad sleep" (BS), "negative perceptions when waking up" (NP), and "dream content" (DC).

The Pittsburgh Sleep Quality Index and the Subjective questionnaire on sleep quality perception México – Colombia 2005-2006 instruments have been validated for the Colombian population (25,28,30,33). The

Loving and Liking scale is in the process of being validated in Spanish, and it was adapted by this research group (26).

Statistical Analysis: The database was created in Microsoft Excel 2010 and analyzed using the modules for complex samples of SPSS® 20.0 (IBM Corporation, Armonk, NY, USA). Univariate, bivariate and multivariate analysis were performed. Variable quartiles were calculated for comparison between groups; then the variables were categorized as low (<P25th), middle (P25th-P75th) and high (>P75th).

Point estimators were estimated at a confidence interval (CI) of 95%. The precision of the estimators was determined using standard error (SE) and relative standard error (RSE), taking as reference the international statistical research parameters in which an estimator may be category A (RSE <15%), B (RSE 15.1-30%), C (RSE: 30.1-50%) or D (RSE >50%). Given this, the precision estimators were admitted as category A.

The association of the qualitative variables was evaluated by Pearson's chi-squared test and likelihood ratio. Multivariate models of hierarchical ordinal regression were constructed and adjusted for age and sex. Sleep quality perception scores were considered dependent variables and the individual characteristics of romantic relationships as independent variables. The Bonferroni test was used for multiple comparisons among the categories of the variables.

Bias and confounding control: Potential bias in the selection was controlled by random assignment of the participants and by inclusion/exclusion criteria. To guarantee a representative sample, at least 80% of the sleep questionnaires were collected in each group.

Rejecting sleep questionnaires that were inconsistent or poorly filled served to control the bias in classification. Confounding variables were controlled using multivariate analysis methods. The effect of academic performance determinants on sleep quality perception was not evaluated because it was not an objective of this survey. However, it is expected to be homogeneously distributed in this population because it is a probabilistic sample.

Ethical aspects: The research ethics committee of Universidad del Rosario approved this study. It was classified as minimal risk according to current legislation, considering that the personal information collected could be psychologically sensitive. The participants were volunteers, provided verbal informed consent, and were not subordinated to the researchers during the development of the study. Confidentiality of all data was guaranteed.

Results

The final sample comprised 443 health sciences students aged 18 to 25 years. Mean age was 21.16 years \pm 0.087, and 75% were women. The information was collected between September 2012 and January 2013.

The prevalence of students in a relationship was 64% (95%CI: 59.4-68.2). The average rate of relationships among students was 3.75 \pm 0.135 (95%CI: 3.49-4.02), and their mean duration was estimated at 18.8 \pm 1.31 months (95%CI: 16.27-21.43). From the respondent perspective, the characterization of the current relationships and scores obtained in each instrument are shown in Table 1.

Table 1. Estimation of some loving and liking features, obsession and attachment styles of students in a relationship

Questionnaire	Mean	SE	95%CI	
			Low	High
Liking ^a	6.70	0.07	6.6	6.9
Loving ^a	5.44	0.08	5.2	5.5
Relationship Assessment Scale (RAS) Satisfaction level in relationship ^b	2.18	0.04	2.1	2.27
Total Obsessive traits ^c	8.40	0.08	8.25	8.55
Dismissive attachment ^d	2.19	0.04	2.11	2.2
Secure attachment ^d	2.02	0.05	1.93	2.11
Fearful attachment ^d	1.74	0.04	1.66	1.83
Preoccupied attachment ^d	1.67	0.04	1.6	1.7

SE= standard error; CI= Confidence interval.

a) Likert rating range: 1 = "not completely true/ completely disagree" - 9 = "Definitely true/completely agree";

b) Likert rating range: 1 = "Low satisfaction" - 5 = "High satisfaction", items 4 and 7 are reverse scored;

c) Likert rating range: 1 = "not at all" - 4 = "all day/extremely";

d) Likert rating range: 1 = "rarely" - 4 = "almost always".

Source: Own elaboration based on data obtained in the study.

Students reported needing 7.88 \pm 0.6 (95%CI: 7.75-8.01) hours of nocturnal sleep to feel rested upon waking up, of which they slept a mean of 6.5 \pm 0.5 (95%CI: 6.39-6.62) hours per night. Sleep latency was lower than fifteen minutes in 44.4% (95%CI: 39.6-49.4), between 15 minutes and a half hour in 5.9% (95%CI: 4-8.6), and 2.8% (95%CI: 1.5-5) took more than 30 minutes to fall asleep with a frequency of more than five nights in the week, totaling 53.1% of the observed sample. The remaining population showed higher variability in sleep latency during the week but with a lower frequency (less than five nights). 45% of the students experienced mild diurnal somnolence, 24.3% moderate, and 7.7% severe; only 23% of the students reported no diurnal somnolence.

Regarding sleep quality perception, "good sleep" (GS) scored higher (mean: 3.3 \pm 0.03; 95%CI: 3.24-3.37), followed by "bad sleep" (BS) (mean: 2.04 \pm 0.03; 95%CI: 1.98-2.09) and "negative perceptions when waking up" (NP) (mean: 1.67 \pm 0.05; 95%CI: 1.57-1.77). With respect to dreaming, the highest score was for agreeable dreams, and the lowest for erotic dreams.

40% (95%CI: 29-37.5) of the students reported interfering nocturnal sleep factors, which included academic work (50.8%), environmental conditions (24%), personal conditions (21%), health problems (17.2%), social activities (16.6%), and work or academic activities at night (12.4%). The consumption of psychoactive substances during the week showed a predominance of alcohol (37.2%), followed by

tobacco (15.4%), energy drinks (9.5%), marijuana (1.0%), and cocaine (0.5%). The prevalence of sexual activity in this population was estimated to be 32.6% (95%CI: 28.1-37.4). Moreover, 38% (95%CI: 33.4-42.8) of the students slept with their partners all night at least once during the observation week. These factors were not associated to sleep quality perception in the bivariate analysis, therefore, they were not included in multivariate analysis.

Most students who were in a relationship were between 20 and 21 years of age ($p=0.001$), with a higher frequency in women (68% vs. 55%; $p=0.027$). Men reported more relationships (P50: 4 vs. 3; $p=0.005$) with higher scores in the loving component ($p=0.027$), which had an inverse correlation with age ($p=0.004$). Students older than twenty-one presented short sleep latencies more frequently ($p=0.020$), as well as an inverse association with hours of sleep required to feel rested ($p=0.006$), and with GS ($p=0.025$).

In this study, 48% of students who were not in a romantic relationship showed prolonged sleep latencies at some point during the week, while the number was 33% ($p=0.041$) in those who had a relationship. There was not any other association between the main characteristics of perceived sleep quality and being in a romantic relationship.

Five multivariate models showed significant associations. These models included GS perception, negative perception, number of slept hours needed to feel rested upon waking up, average number of hours slept per night, and number of recalled dreams. Statistical details obtained from these multivariate models are presented in Table 2.

Table 2. Multivariate analysis of sleep quality perception in students, and characteristics of romantic relationships.

Relationship characteristics	Effect on Sleep Quality Perception *	OR	OR - 95%CI	
			Inf	Sup
Low satisfaction level	Negative perceptions at wake up	3.224	1.613	6.442
High satisfaction level	Good Sleep	2.565	1.153	5.705
	Number of hours slept	2.585	1.309	5.105
	Number of dreams recalled	2.235	1.112	4.489
Low liking	Number of dreams recalled	3.911	1.91	8.01
	Number of hours required to feel rested at wake up	2.181	1.135	4.19
Age <20 yrs.	Good Sleep	2.491	1.25	4.964
	Number of hours slept	2.376	1.305	4.324
More than 5 relationships including the current	Good Sleep	4.356	1.474	12.875
Low fearful attachment style	Number of hours required to feel rested at wake up	4.218	1.576	11.291
High obsession traits		2.696	1.362	5.338
Female		1.974	1.098	3.548
Low dismissive attachment style	Good Sleep	2.506	1.101	5.704

* All models were adjusted by age and sex. $p<0.05$.

Source: Own elaboration based on the data obtained in the study.

Both male and female students reported a high level of satisfaction with their current relationship, had more than 5 previous relationships, a low level of dismissive attachment, were younger than 20 years, and rated sleep quality as good. Furthermore, NP was associated with

a low level of satisfaction. Additionally, women reported needing more sleep hours to feel rested upon waking up, had lower levels of liking their partners, as well as a lower fearful attachment style, and higher levels of obsessive traits. Students younger than 20 years and those with a higher level of satisfaction with their relationship slept more nocturnal hours.

Furthermore, those students with a higher level of satisfaction in their current relationship and those with low levels of liking their partner were able to recall more dreams.

Discussion

Studies that relate emotional aspects of relationships with sleep quality, although few in number, have focused on hypomanic symptoms and obsessive traits, as well as on anxiety and depression (8,9,18,22,34,35). This study is the first of its type conducted in Latin America.

The prevalence of current individual romantic relationships in this study was 64%, with a higher frequency among women, while men reported a greater number of relationships, which coincides with the literature. It has been reported that during late adolescence at least 70% of individuals have a relationship (1,2). For example, Brand found a prevalence of current individual relationships of 67% in young Swiss students (9), Bajoghli *et al.* estimated 44% of relationships in Iranian adolescents, and Viejo-Almanzor (34) found a rate of 37% in 24 Spanish schools.

These variations could reflect different criteria to define romantic relationships. For this study, the participants did not define their relationship status based on a duration criteria, which in average lasted 18 months. Because of this and the probabilistic sampling used, it can be inferred that the spectrum of romantic relationships included "flirting", "going out with someone", and couples engaged or living together, as defined by Viejo-Almanzor *et al.* (34).

The population in this study slept fewer average hours than the sample in the validation study of the sleep questionnaire used (6.5 vs. 7.22 hours, respectively) probably due to the latter being limited to late adolescents (mean age of 18.6 years \pm 2.81), while this study included young adults as well (mean age: 21.16 years \pm 1.85) (33). This difference may be caused by both biological and psychosocial factors, as well as the academic load associated with the difference in age (5,7). Nevertheless, sleep quality perception scores were similar between both populations (GS: 3.331 vs. 3.32; BS: 2.04 vs. 1.92; NP: 1.67 vs. 1.68).

In this study, sleep quality did not differ significantly among students regarding being or not in sentimental relationship. However, opposite results have been found. In 2014, Bajoghli *et al.* found that individuals with higher scores for being in love were associated with better sleep quality (9,19,20). In a different study, Bajoghli *et al.* evaluated the state of being in love in females in Iran, and did not find any association between being in love and sleep quality, even though it was associated with traits of hypomania and physical activity (18). The same finding was obtained in another study by the same author in Iranian female and male adolescents published in 2013 (22).

Subjects who were in their first relationship had a lower probability of GS, regardless of the duration of the relationship, in contrast to what was found by Brand, who concluded that subjects in recently-formed relationships reported better perception of sleep quality (9). The level of satisfaction with the relationship was found to be a predictor of sleep quality in four of the five multivariate models.

The probability of GS, the number of hours slept, and dreams recalled were greater in those who were highly satisfied with their relationships, while those who were not satisfied had a greater

probability of NP. This might be attributable to the reduction of negative emotional load resulting from being satisfied with the partner (8,35,36). This fact is reaffirmed by the decrease in sleep quality in those subjects with higher scores in obsessive traits, and with preoccupied, fearful, or dismissive attachment styles.

Liking the partner was another characteristic that predicted sleep quality in the multivariate models of the present study. Subjects with a higher level of liking their companions reported needing fewer hours of sleep to feel rested upon waking up. This finding is consistent with other research in which being intensely in love, self-described as “sick with love”, is reflected by better sleep quality, even though sleep hours are fewer (9). Persons strongly attracted to their partners, in addition to needing fewer hours of sleep, reported fewer dreams recalled during the week. The effect of academic performance determinants on sleep quality perception was not an objective of this survey.

One of the limitations of this study was the definition of relationship, which varies from one culture to another, therefore, there is no universal criterion that can be applied in this type of research (1). The information collected here is based on self-reporting instruments, which limits the researchers' control over the way in which they are filled out. There were no objective quantification methods for sleep, and because this was a cross-sectional study, it was only possible to estimate associations without establishing causality.

Conclusions

This study examined sleep quality perception, associations with relationship status and attachment style in young people. The results contribute to the development of intervention strategies that could enhance the daily performance and mental health of this population.

The results of this study support the hypothesis that the perception of sleep quality in adolescents and young adults is associated with some characteristics of romantic relationships, since those who are in that situation take less time to fall asleep. The perception of sleep quality is associated positively with the level of satisfaction and the level of liking the partner. Obsessive traits, as well as the “dismissive”, “fearful”, and “preoccupied” attachment styles are associated with negative perception of sleep quality.

The associations found between perceived sleep quality and some characteristics of romantic relationships in adolescents and young adults assessed in this study are highly relevant for their health condition. The support system of educational institutions must recognize the importance of these aspects for the health and academic performance of their students.

Conflicts of interest

None stated by the authors.

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