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Background

Secretory IgA (SIgA) is the major class of immunoglobulins in mucosal secretions and is considered to be a major effector of host defense against microorganisms causing illnesses such as upper respiratory tract infections.

Increasingly, researchers have been examining the influence of sleep debt (chronic partial sleep deprivation) on health and there is emerging evidence that poor sleep has an impact on physical health.

The primary aim of the present study was to examine the extent to which baseline levels of SIgA are associated with both psychological stress and self-reported sleep.

Stress

Perceived Stress Scale (PSS) is a 10-item Likert-type scale that asks respondents “In the last week, how often have you . . .” and includes items such as “felt nervous and stressed?”, “felt that you were unable to control the important things in your life?”. Response choices range from (0) “Never” to (4) “Very Often”, with a maximum possible score of 40 points.

Inventory of College Students' Recent Life Experiences (ICSRLE) scale is a 49-item measure of the number and intensity of hassles experienced during the past month (e.g., “Financial conflicts with family members” or “finding courses uninteresting”).

Sleep

Pittsburg Sleep Quality Index (PSQI) differentiates “poor” from “good” sleep by measuring seven areas: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction over the last month. The subject self-rates each of these seven areas of sleep based on the past month’s sleep behaviors.

Epworth Sleepiness Scale (ESS) is an 8-item scale in which subjects indicate the likelihood of dozing in a variety of situations (e.g., “Watching TV”).

Secretory Immunoglobulin A (SIgA)

SIgA secretion rates (SIgA concentration X saliva secretion rate) were transformed (square-root) to normalize the distribution. SIgA levels differed significantly between males and females; therefore the data was analyzed separately for each sex.

Method

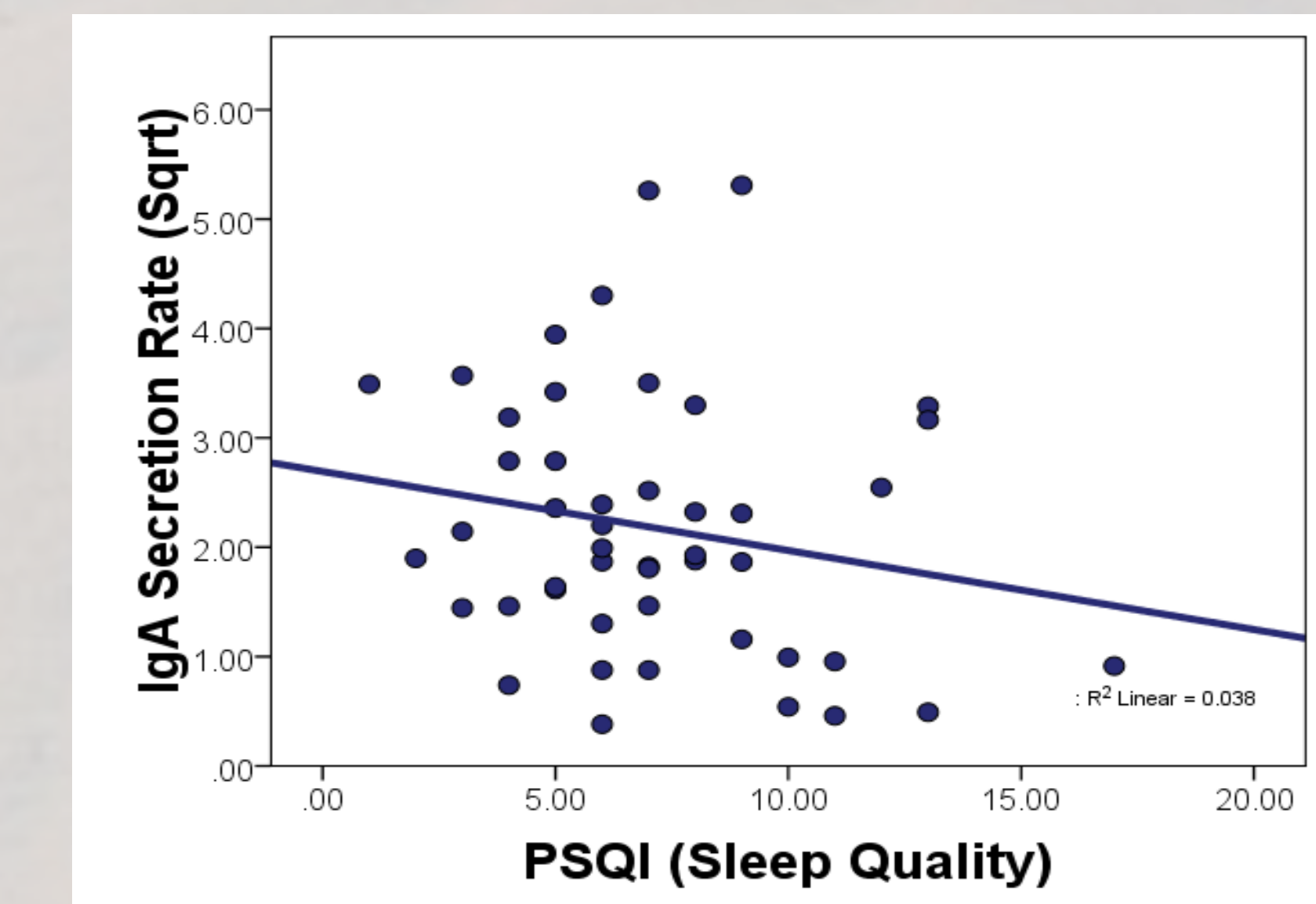
A total of 120 undergraduate students (mean age 22.7 (5.7), 53% female, 93% Hispanic) attended group sessions ranging in size from three to eighteen students. After a five minute quiet sitting period, each participant provided a three-minute timed saliva sample and then completed a packet of paper-and-pencil measures.

The measures included demographic and health behavior questions, measures of sleep quality (Pittsburgh Sleep Quality Index [PSQI]), daytime sleepiness (Epworth Sleepiness Scale [ESS]), and two stress measures (Perceived Stress Scale [PSS] and the Inventory of College Students' Recent Life Experiences [ICSRLE]).

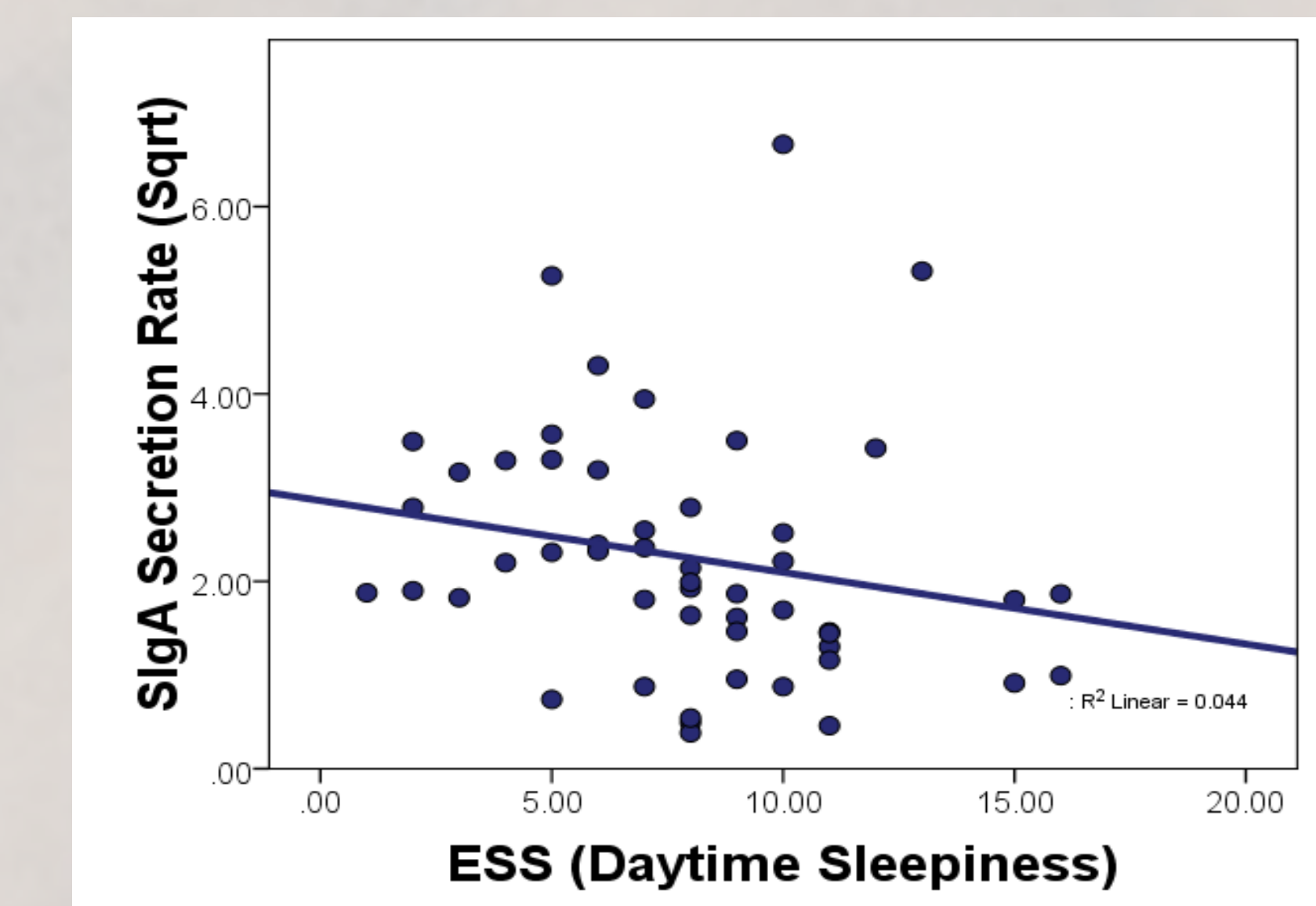
Results

Individuals who reported smoking more than five times per week were excluded from analyses, along with male and female subjects with SIgA secretion rates ± 2.5 SD from the mean. The final sample consisted of 56 males and 56 females.

Poor sleep quality (higher PSQI scores) was associated with lower SIgA secretion rate in males ($r(41)=-.46$, $p<.001$), but not females ($r(43)=.09$, $p>.05$).



Daytime sleepiness was negatively associated with SIgA secretion rate for males ($r(44)=-.37$, $p=.007$), but no significant association was found for females ($r(56)=-.15$, $p>.05$).



Male SIgA secretion rate was not associated with either measure of stress (self-perceived stress, PSS, $r(43)=-.22$, $p>.05$ and recent life experiences, ICSRLE, $r(43)=-.17$, $p>.05$). The same null finding was true for females (PSS, $r(56)=.22$, $p>.05$; ICSRLE, $r(54)=.19$, $p>.05$).

Discussion

In conclusion, our study suggests that self-reported psychological stress levels are not a viable predictor of baseline Secretory Immunoglobulin A secretion rate, but that self-reported sleep quality is positively correlated with this immune measure in males. Additional research is needed to determine whether or not these findings are replicable and, if so, to elucidate why the disparity between males and females exists.