The Differential Effects of Sleep Quality and Quantity on the Relationship between SES and Health

AMY E. SICKEL,[a,b] PHILIP J. MOORE,[b] NANCY E. ADLER,[c]
DAVID R. WILLIAMS,[d] AND JAMES S. JACKSON[d]

[b]Department of Psychology, George Washington University,
Washington, D.C. 20052, USA

[c]Department of Psychiatry, University of California,
San Francisco, California 94115, USA

[d]Institute for Social Research, University of Michigan, Ann Arbor, Michigan 48106, USA

INTRODUCTION

Although socioeconomic status (SES) has long been recognized as a principal determinant of health, one factor yet to be considered in the context of SES and health is the role of sleep. Individuals of lower socioeconomic status have been found more likely to experience sleep disorders,[1] and sleep disturbances have been associated with poorer health.[2] The amount of sleep people get has been found to mediate the relationship between stress-related intrusive thoughts and natural killer cell levels.[3] However, sleep has yet to be examined as a potential mediator of the impact of socioeconomic status on physical or mental health. This study tested the following three hypotheses. First, participants of higher socioeconomic status will report better psychological health. Second, participants of higher socioeconomic status will report better physical health. Third, the relationship between participants' socioeconomic status and their health will be mediated by either their quantity or quality of sleep.

METHOD

The data for the current analyses comes from the 1995 Detroit Area Study (DAS), a multistage area probability sample of adults. Face-to-face interviews were conducted on 520 Caucasians and 586 African Americans. 63% (693) were women who ranged in age from 18 to 89 years old, with an average age of 46 years.

[a]Address for correspondence: Department of Psychology, George Washington University, 2125 G. Street, NW, Washington, DC 20052, USA. 202-994-4942 (voice); 202-994-1602 (fax).
   e-mail: sickel@gwu.edu

Socioeconomic Status

There were two measures of SES. First, *degree years* of education indicated the number of years associated with participants' completion of their highest degree. Second, participants reported access to *income* for 1994.

Sleep

Sleep quantity indicated participants' average hours of sleep per night during the previous month. *Sleep quality* was assessed on a 1–5 scale (1, "poor"; 5, "excellent").

Psychological and Physical Health

The index of *psychological health* combined participants' reports of depression and their overall satisfaction with their lives ($r = -0.22$, $p < 0.001$). Depression responses indicated whether participants had felt depressed for two weeks or more during the previous 12 months, ("yes" or "no"). Current life satisfaction was measured on a 1–5 scale (1, "not at all satisfied"; 5, "completely satisfied"). Both measures were standardized and combined to form an aggregate, single-item measure of psychological well being. Self-reported overall *physical health* was assessed by participants' responses on a l-to-5 scale (1, "poor"; 5, "excellent").

RESULTS

Psychological Health

Although participants' education levels were not directly related to either their sleep quality or mental health, higher income was associated with both better sleep quality ($b = 0.11$, $p < 0.01$) and greater psychological well-being ($b = 0.21$, $p < 0.001$). Better psychological health was also associated with better sleep quality ($b = 0.18$, $p < 0.001$). Sleep quantity was unrelated to participants' education, income, or their mental health. (FIG. 1).

Physical Health

As in the model of psychological well-being, higher income was directly associated with more education ($b = 0.35$, $p < 0.001$), better sleep quality ($b = 0.11$, $p < 0.01$) and better physical health ($b = 0.13$, $p < 0.01$). Physical well-being was also directly related with more education ($b = 0.14$, $p < 0.01$) and better sleep quality ($b = 0.24$, $p < 0.001$), whereas sleep quantity was unrelated to either SES or physical health (FIG. 2).

Sleep Quality versus Sleep Quantity

Regression analyses tested the effect of the interaction between sleep quality and quantity on physical and psychological health. This interaction was a significant predictor of participants' physical health ($b = -0.34$, $p < 0.05$).
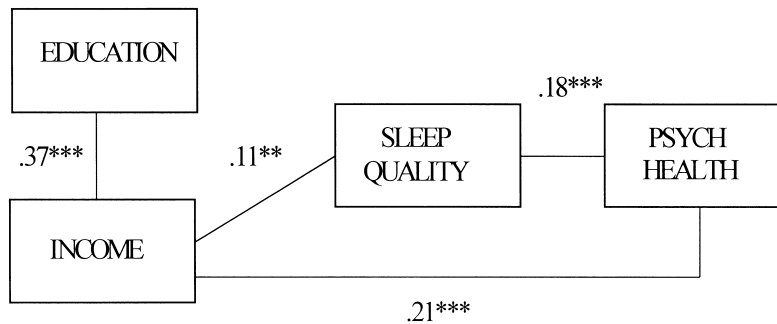
FIGURE 1. Path-analytic model (*n* = 928) predicting psychological health from education, income, and sleep quality. Models show standardized regression coefficients. ***$p < 0.001$; **$p < 0.01$.

DISCUSSION

Considered separately, both income and education were associated with both physical and psychological health. However, when combined to predict health, income continued to exert a direct influence on both physical and psychological well being, whereas education predicted only physical health. Sleep quality mediated the effect of income on physical and psychological health, and sleep quantity moderated the relationship between sleep quality and physical well being. These findings are consistent with previous research showing significant associations between SES and health, but also suggest that different components of socioeconomic status operate through different pathways to affect health.
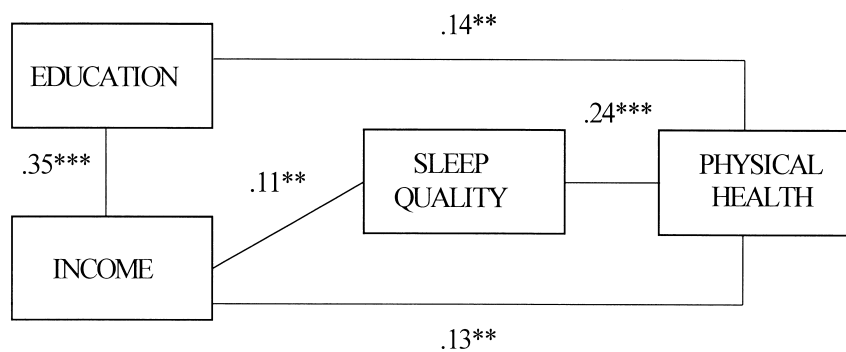

FIGURE 1. Path-analytic model (*n* = 928) predicting self-reported physical health from education, income, and sleep quality. Models show standardized regression coefficients. ***$p < 0.001$; **$p < 0.01$.

REFERENCES

1. HUNT, S.M., J. MCEWEN & S.P. MCKENNA. 1985. Measuring health status: a new tool for clinicians and epidemiologists. J. Roy. College Gen. Pract. **35:** 185–188.
2. SEGOVIA, J., R.F. BARTLETT & A.C. EDWARDS. 1989. The association between self-assessed health status and individual health practices. Can. J. Pub. Health **80:** 32–37.
3. HALL, M., A. BAUM, M.D. BUYSSE, H.G. PRIGERSON, *et al.* 1998. Sleep as a mediator of the stress–immune relationship. Psychosom. Med. **60:** 48–51.