



Sleep quality and sleep duration are associated with charitable donations: Evidence from two population-based surveys

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ABSTRACT

Study objectives: Insufficient sleep alters emotional processing, leading to mood disturbances, reduced gratitude, and potentially the withdrawal of compassionate helping. Using data from two national surveys, we investigated whether sleep quality and sleep duration were associated with willingness to donate to local charities and places of worship.

Methods: We conducted secondary analyses of two Gallup-administered studies that used random address-based sampling methodologies to approximate population-representative samples. BRS-5 included 1501 respondents and BRS-6 included 1336 respondents (independent samples). Each survey inquired about sleep quality and whether participants had donated in the last year to local organizations and places of worship. In addition, BRS-5 included questions about sleep duration.

Results: In both studies, participants who had better sleep quality and better sleep durations were more likely to donate charitably to local organizations and places of worship (ORs of 1.07–1.45). Most associations remained significant when accounting for age, gender, and income.

Conclusion: Better sleep was associated with a greater likelihood to donate charitably. Experimental work is needed to determine if the relationship between sleep health and prosocial behaviors is uni- or bi-directional.

1. Introduction

Philanthropic behaviors are typically attributed to personal values, socioeconomic status, and empathy for other people [1–3]. However, willingness to donate is not solely a personality characteristic, but also can fluctuate in relation to one's current emotional state [1]. Emerging research indicates that sleep quantity and sleep quality may be important moderators of socio-emotional processes and willingness to engage in prosocial behaviors. For example, in laboratory settings, reducing sleep has a negative impact on empathy [4], gratitude [5], interpersonal connectedness [6], and altruistic responding [7]. In the broader population, donations and civic engagement are lower following the spring Daylight Saving Time shift [8] and at time-zone boundaries [9], which could implicate mild sleep loss as an influencer of prosocial behaviors. Based on this literature, we hypothesized that people with inadequate or poor quality sleep would be less likely to donate to organizations. We tested this hypothesis using data from two national surveys that included items on sleep quality, sleep duration, and willingness to make charitable donations (local organizations and places of worship).

2. Methods

We conducted secondary analyses of two independent samples from the cross-sectional Baylor Religion Surveys (BRS; [10,11]). Each BRS was conducted by Gallup and included 11,000 mailed surveys. BRS-5 was administered via paper surveys in 2017 and had a 13.6 % completion rate (N = 1501 respondents; M_{age}: 54.95 years \pm 0.46, 58.1 % female; 72.4 % with household income below \$100,000). BRS-6 was administered to another group of randomly-selected participants in 2021 and included paper or web-based response options (N = 1336 respondents; M_{age}: 54.89 years \pm 0.49, 53.8 % female; 68.8 % with household income below \$100,000). Both studies used random address-based sampling methodologies to approximate population-representative samples, with stratification weighting targets matching national demographics for age, gender, race/ethnicity, education, and region. The surveys were provided in both English and Spanish and participants included adults from all 50 states and D.C., including both urban and rural areas. If participants did not return the first survey, they were mailed up to two reminders. If a participant

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returned multiple complete surveys, then the repeated surveys were discarded; if participants returned multiple partially completed surveys, then the more completed survey was used. A flow chart is shown in [Fig. S1](#).

We extracted sleep, donations, and demographic data from each study. The exact wording of each item is provided in [Table S1](#). With regard to donations data, each survey inquired about donations to local organizations as a binary variable (yes or no). Participants also selected the amount they donated to places of worship amongst eight categories/ranges. We examined donation amount, but also transformed responses to a binary outcome (yes donation or no donation) for consistency with the local organization donation measure. With regard to sleep, both studies also included questions about restlessness and sleep onset latency (SOL); we transformed these responses to Z-scores and averaged them such that higher values indicated better sleep quality. In addition to sleep quality items, BRS-5 included a question about sleep duration; we classified participants based on whether they met the consensus sleep duration of 7–9 h/night [\[12\]](#).

We conducted a series of logistic regressions to determine whether the odds of donating to local organizations or places of worship was related to sleep quality or sleep duration. We conducted both unadjusted analyses and adjusted analyses (controlling for age, gender, and income). All tests were two-tailed with alpha set to 0.05. Statistical analyses were conducted using SPSS version 28. The Baylor University Institutional Review Board exempted this secondary analysis of de-identified, publicly accessible data. All materials and data are available at www.thearda.com.

3. Results

We first examined the bivariate relationships between the primary dependent variables ([Tables S2–S3](#)). Because donating to local organizations was weakly associated with donating to places of worship in both studies ($r = 0.17$ and $r = 21$), we treated these outcome variables separately. The sleep-donations results are displayed in [Fig. 1](#) and showed conceptual replication across the two cross-sectional studies ([Table S4](#)).

In BRS-5, people were more likely to donate charitably to a local organization and a place of worship if they had sleep durations within the recommended 7–9 h range (local: OR = 1.39, 95%CI: 1.11, 1.75, $p = .004$; place of worship: OR = 1.45, 95%CI: 1.00, 2.09, $p = .05$; donation amount: rho = 0.09, $p = .005$). Donating to local organizations was reduced in both short sleepers (<7 h; OR = 0.74, $p = .01$) and long sleepers (>9 h; OR = 0.46, $p = .03$), relative to the 7–9 h reference group. Similar effect sizes were observed for reduced likelihood of donating to places of worship when separating short sleeper groups (OR = 0.70, $p = .07$; donation amount: rho = -0.08, $p = .01$) and long sleeper groups (OR = 0.56, $p = .31$; donation amount: rho = -0.08, $p = .03$), though these associations were less consistent, possibly due to the reduced sample sizes.

In addition to sleep duration, BRS-5 participants with better sleep quality were also significantly more likely to donate to local organizations (OR = 1.18, 95%CI: 1.03, 1.34, $p = .02$) and a place of worship (OR: 1.38, 95%CI: 1.11, 1.72, $p = .003$; donation amount: rho = 0.16, $p < .001$). Adjusting for age, gender, and income reduced but did not eliminate the effects ([Table S4](#)). Even after adjustment, willingness to donate to a place of worship was still associated with better sleep quality (OR = 1.30, 95%CI: 1.03, 1.64, $p = .03$), and willingness to donate to a local organization was still associated with sleep durations within the 7–9 h range (OR = 1.28, 95%CI: 1.00, 1.65, $p = .05$). Sleep duration and sleep quality did not show significant interactions for the donation outcomes ($p > .50$).

Similar outcomes emerged in the BRS-6 study, which included measures of sleep quality but not a measure of sleep duration. Better sleep quality was associated with greater willingness to donate to a local charity (OR = 1.33, 95%CI: 1.16, 1.52, $p < .001$) and greater donation

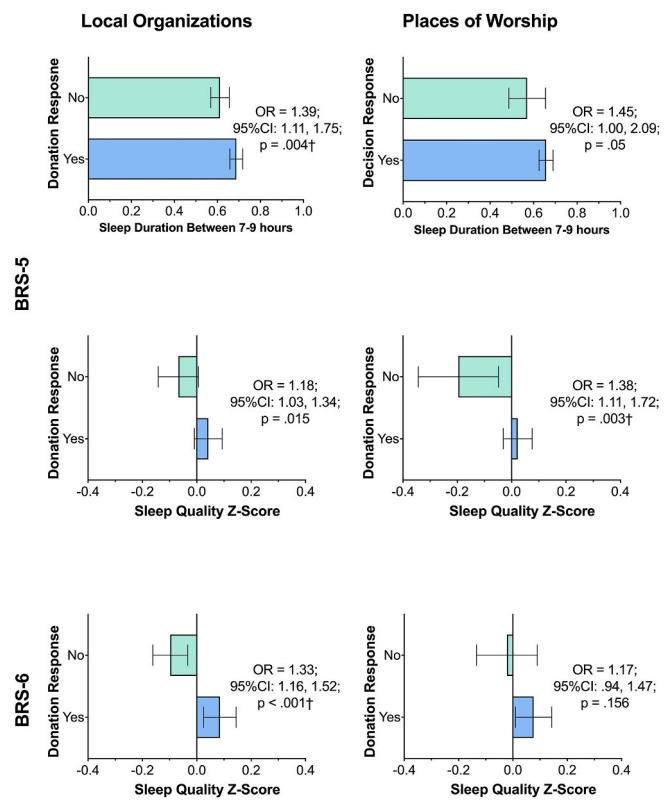


Fig. 1. Relationship between donation type and sleep quality/quantity across BRS-5 and BRS-6. † indicates $p \leq .05$ after adjusting for age, gender, and income. Error bars are 95 % CIs.

amounts to places of worship ($\rho = 0.11$, $p = .005$; but not donations to places of worship as a binary outcome: OR = 1.17, 95%CI: 0.94, 1.47, $p = .16$). After adjusting for income, age, and gender, better sleep quality was still significantly associated with willingness to donate to a local charity (OR = 1.18, 95%CI: 1.01, 1.38, $p = .04$).

Lastly, we explored whether similar sleep-donation outcomes would emerge for different race/ethnicity groups, education levels, and religious affiliations. [Table S5](#) shows that the effect sizes were relatively consistent across subgroups.

4. Discussion

In two population-based studies we found that better sleep was associated with a 7 %–45 % greater likelihood of charitably donating. These findings add to a growing body of evidence that better sleep promotes positive emotions, not just reduces negative emotions or mood disturbances [\[5,13\]](#).

Three interpretations of the sleep—donations association should be considered. First, it is possible that the sleep-donations association reflects a shared trait, such as a positively-disposed personality [\[14\]](#). In support of this trait/personality view, happy individuals are more likely to donate than unhappy individuals [\[1\]](#) and people who score highly on positive affect scales tend to be more likely to report better sleep quality [\[14\]](#). Second, it is possible that individuals were more likely to have better sleep quality because they had made charitable donations. The act of giving increases feelings of happiness, at least temporarily [\[3\]](#), which may subsequently facilitate sleep quality (e.g., better sleep onset latency via fewer negative pre-sleep cognitions; [\[15\]](#)). In support of this possibility, experimental work has shown that inducing gratitude (e.g., with a gratitude writing activity) is followed by an increase in happiness/well-being and better sleep quality [\[16\]](#).

A third possibility is that a well-rested brain may feel greater

empathy, greater interpersonal connectedness [6], and greater gratitude [5]. There is also evidence that better sleep can have a positive influence on emotional intelligence [17], implicit biases [18], judgments [19], and trust and altruistic behaviors [7], amongst a range of other social cognitive processes [20]. Studies have documented that fostering such processes—particularly empathy, altruism, and generosity—is foundational to prosocial behaviors such as willingness to donate resources [1, 3]. If so, then it is possible that better sleep is a precipitating factor that increases willingness to donate [5,8,9].

This study had limitations including a cross-sectional design, reliance on self-report, and low survey response rate. Low response rates can limit the generalizability of findings because the participants who respond may differ in meaningful ways from the individuals who do not respond to the survey invitation. Therefore, the current findings will benefit from replication in studies with higher response rates, as well as in studies that involve objective, longitudinal tracking of sleep and charitable donations. In addition, experimental work is needed to determine if improving sleep causally increases charitable donations, if engaging in prosocial behaviors causally improves sleep quality, or if both occur (bidirectional view).

The current work adds to the emerging literature that focuses on the positive outcomes of sleep health [21], or how improving one's sleep quality could yield health benefits and promote human flourishing [5, 22]. This knowledge may benefit nonprofit organizations, policymakers, and community leaders in developing targeted initiatives focused on healthy sleep practices, enroute to promoting a culture of giving and social responsibility.

Data availability

All data are publicly available at www.thearda.com.

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Consent and ethics

Retrospective analysis of publicly available de-identified Gallup survey data.

Clinical trial registration

Not a clinical trial.

CRediT authorship contribution statement

Allison E. Nickel: Writing – review & editing, Writing – original draft, Conceptualization. **Michael K. Scullin:** Writing – review & editing, Writing – original draft, Supervision, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.sleep.2024.10.007>.

References

- [1] Anik L, Akin LB, Norton MI, Dunn EW. Feeling good about giving: the benefits (and costs) of self-interested charitable behavior. Harvard Busi School Market Unit Working Paper 2009;10-2.
- [2] List JA, Pysakhovich Y. Charitable donations are more responsive to stock market booms than busts. *Econ Lett* 2011;110(2):166–9.
- [3] Ren Q, Ye M. Donations make people happier: evidence from the Wenchuan earthquake. *Soc Indicat Res* 2017;132(1):517–36.
- [4] Guadagni V, Burles F, Ferrara M, Iaria G. The effects of sleep deprivation on emotional empathy. *J Sleep Res* 2014;23(6):657–63.
- [5] Do, A., Schnitker, S. A., & Scullin, M. K. Gratitude, flourishing, and prosocial behaviors following experimental sleep restriction and sleep extension. *J Posit Psychol*.
- [6] Palmer CA, John-Henderson NA, Bawden H, Massey A, Powell SL, Hilton A, Carter JR. Sleep restriction reduces positive social emotions and desire to connect with others. *Sleep* 2023;46(6):zsac265.
- [7] Dickinson DL, McElroy T. Sleep restriction and circadian effects on social decisions. *Eur Econ Rev* 2017;97:57–71.
- [8] Ben Simon E, Vallat R, Rossi A, Walker MP. Sleep loss leads to the withdrawal of human helping across individuals, groups, and large-scale societies. *PLoS Biol* 2022;20(8):e3001733.
- [9] Holbein JB, Schafer JP, Dickinson DL. Insufficient sleep reduces voting and other prosocial behaviors. *Nat Human Behav* 2019;3(5):492–500.
- [10] Froese P. Baylor religion survey. Wave VI; 2024, January 12. <https://doi.org/10.17605/OSF.IO/RY8GW>. 2021.
- [11] Froese P. Baylor religion survey. Wave V; 2020, December 1. <https://doi.org/10.17605/OSF.IO/5SYNU>. 2017.
- [12] Watson NF, Badr MS, Belenky G, Bliwise DL, Buxton OM, Tasali E. Joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society on the recommended amount of sleep for a healthy adult: methodology and discussion. *J Clin Sleep Med* 2015;11(8):931–52.
- [13] Shen L, van Schie J, Ditchburn G, Brook L, Bei B. Positive and negative emotions: differential associations with sleep duration and quality in adolescents. *J Youth Adolesc* 2018;47:2584–95.
- [14] Ong AD, Kim S, Young S, Steptoe A. Positive affect and sleep: a systematic review. *Sleep Med Rev* 2017;35:21–32.
- [15] Wood AM, Joseph S, Lloyd J, Atkins S. Gratitude influences sleep through the mechanism of pre-sleep cognitions. *J Psychosom Res* 2009;66(1):43–8.
- [16] Jackowska M, Brown J, Ronaldson A, Steptoe A. The impact of a brief gratitude intervention on subjective well-being, biology, and sleep. *J Health Psychol* 2016;21(10):2207–17.
- [17] Killgore WD, Kahn-Greene ET, Lipizzi EL, Newman RA, Kamimori GH, Balkin TJ. Sleep deprivation reduces perceived emotional intelligence and constructive thinking skills. *Sleep Med* 2008;9(5):517–26.
- [18] Alkozei A, Haack M, Skalamera J, Smith R, Satterfield BC, Raikes AC, Killgore WD. Chronic sleep restriction affects the association between implicit bias and explicit social decision making. *Sleep Health* 2018;4(5):456–62.
- [19] Nguyen S, Corrington A, Hebl MR, Scullin MK. Endorsements of surgeon punishment and patient compensation in rested and sleep-restricted individuals. *JAMA Surgery* 2019;154(6):555–7.
- [20] Ben Simon E, Vallat R, Barnes CM, Walker MP. Sleep loss and the socio-emotional brain. *Trends Cognit Sci* 2020;24(6):435–50.
- [21] Buysse DJ. Sleep health: can we define it? Does it matter? *Sleep* 2014;37(1):9–17.
- [22] Scullin MK. The eight hour sleep challenge during final exams week. *Teach Psychol* 2019;46(1):55–63.