

Sleep Disturbance among Individuals with Multiple Myeloma: The Interplay between Physical and Psychosocial Symptoms

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Background

- As long-term survival rates for multiple myeloma (MM) improve, and patients receive more prolonged courses of treatment, individuals living with MM experience cumulative physical symptom burden and psychosocial distress. However, the relationship between physical and psychosocial symptoms in MM remains poorly understood
- Sleep disturbance is a common symptom in MM, and has been linked to both physical symptoms and psychological issues, including fatigue, mood disturbance, and decreased physical function

Aims

- We test our hypothesis that the interaction between physical and psychosocial health is associated with sleep disturbance in a national sample of MM patients

Methods

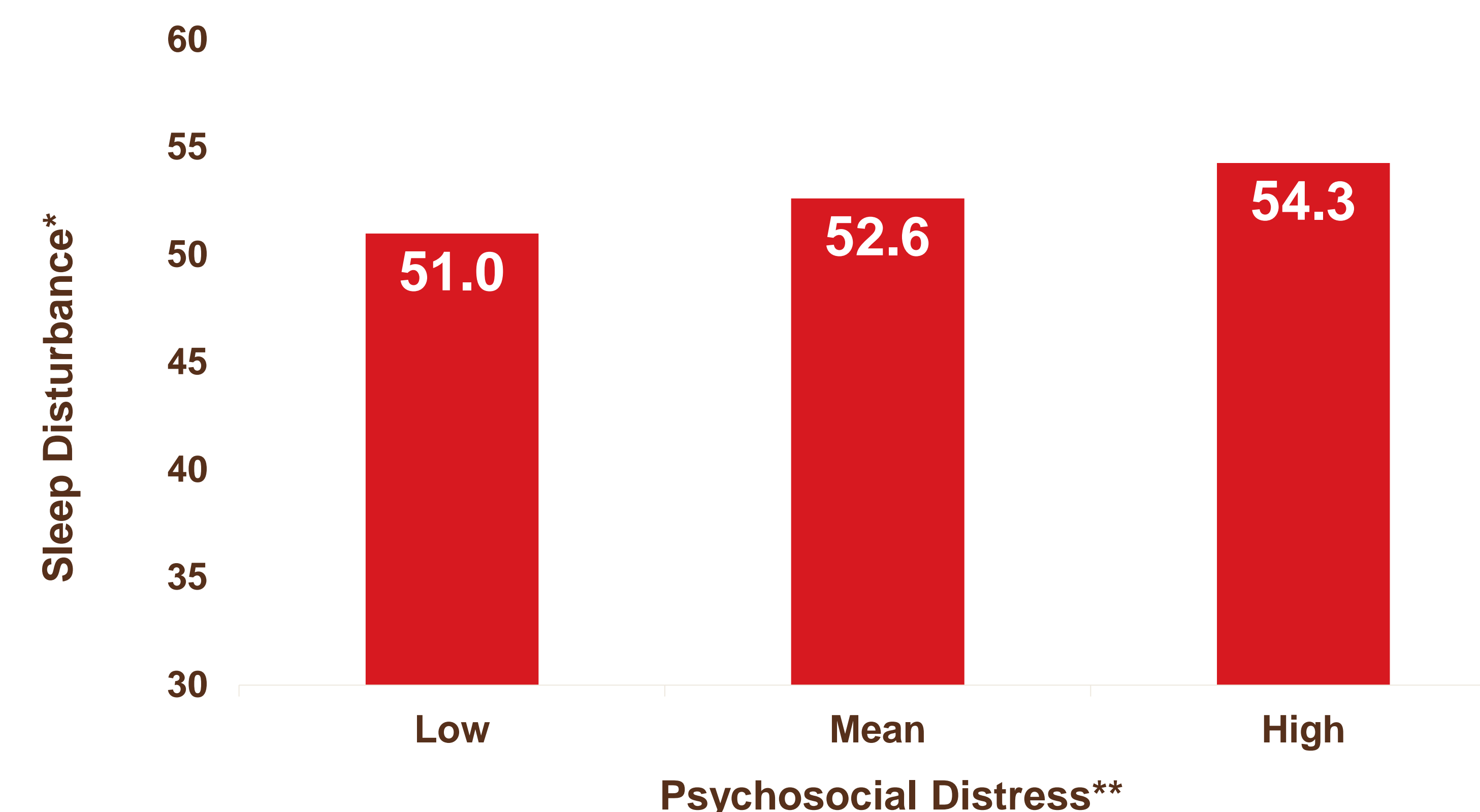
- 288 patients diagnosed with MM (primary diagnosis), enrolled in the Cancer Support Community's online Cancer Experience Registry® and completed the Patient-Reported Outcomes Measurement Information System (PROMIS-29v1.0), a self-reported measure of functioning in 7 domains (depression, anxiety, satisfaction with social roles, physical function, pain interference, fatigue, and sleep disturbance)
- The dependent variable was the continuous T-score on the PROMIS sleep disturbance subscale
- Our independent variables included psychosocial distress, operationalized using a continuous T-score on the PROMIS depression subscale, and physical symptom burden, which we calculate using patient-reported data on daily interference from peripheral neuropathy, bone pain, GI toxicity, and infection
- Using multivariate regression, we predicted sleep disturbance from psychosocial distress and physical symptom burden, controlling for gender, age, race/ethnicity, time since diagnosis, and a dichotomous indicator of ever having received a stem cell transplant
- Next, we calculated an interaction term (physical symptom burden X distress) to evaluate whether sleep disturbance is associated with the concurrent presentation of physical and psychosocial symptoms

Participants

	M/n	SD/%
Age (years)	63	9
	Range: 28 – 87	
Females	153	54%
Non-Hispanic White	247	86%
Time Since Diagnosis	4	4
Stem Cell Transplant	194	70%

Results

Experience with Sleep Disturbance and Psychosocial Distress

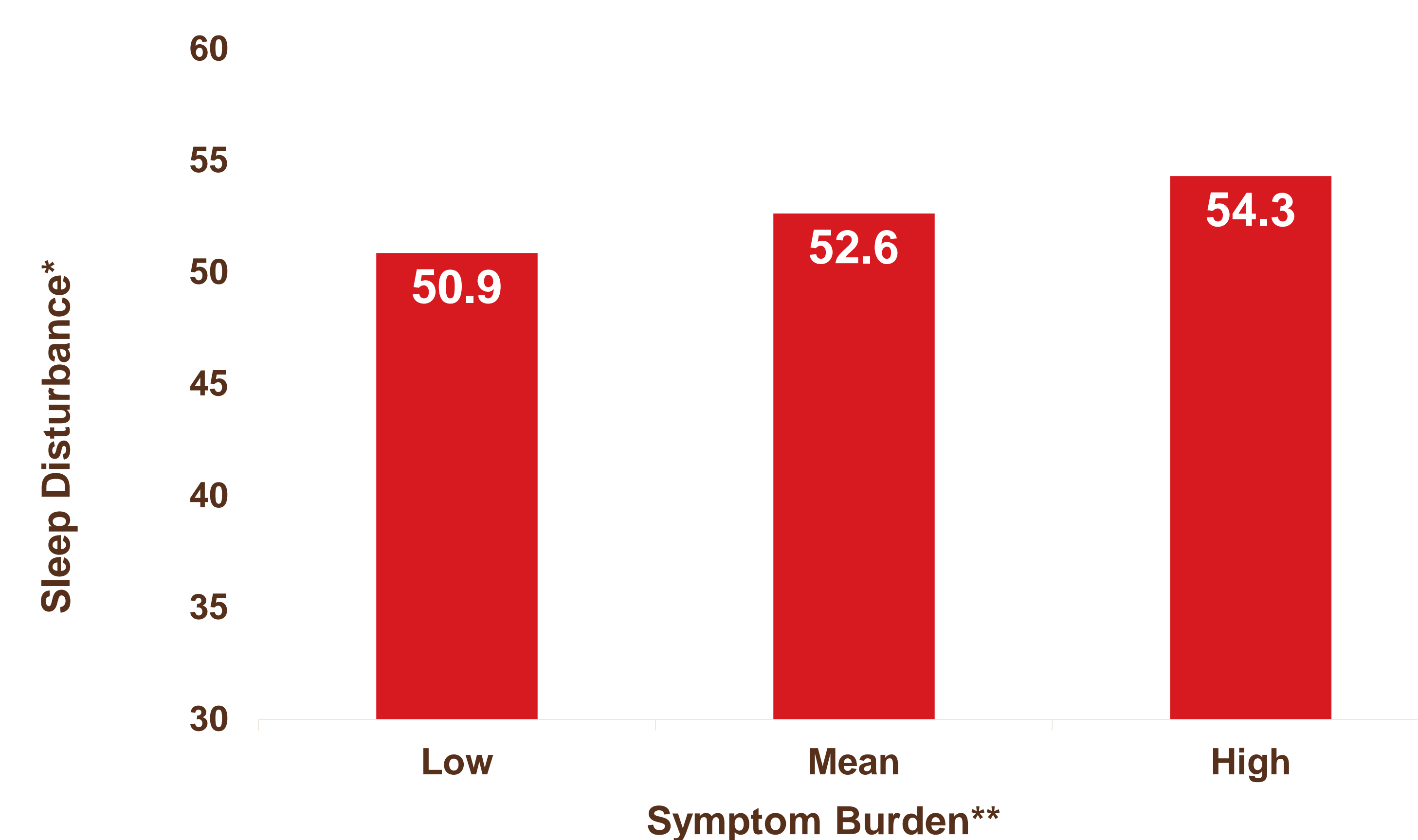


* Predicted Continuous T-score on the Promise-29v1.0 Sleep Disturbance Subscale

** Low and High Psychosocial Distress are Scores Smaller/Greater Than or Equal to 1 SD Away from the Mean (PROMIS-29 Subscales)

- 17% of our sample reported levels of psychosocial distress significantly worse (>1SD) than the national average. 6% fell above (>1SD) the national average for sleep disturbance
- Respondents with higher levels of psychosocial distress report greater sleep disturbance

Experience with Sleep Disturbance and Symptom Burden



* Predicted Continuous T-score on the Promise-29v1.0 Sleep Disturbance Subscale

** Low and High Symptom Burden are Scores Smaller/Greater Than or Equal to 1 SD Away from the Mean

- Respondents with higher levels of symptom burden report greater sleep disturbance

Physical Symptom Burden and Psychosocial Distress are Associated with Sleep Disturbance

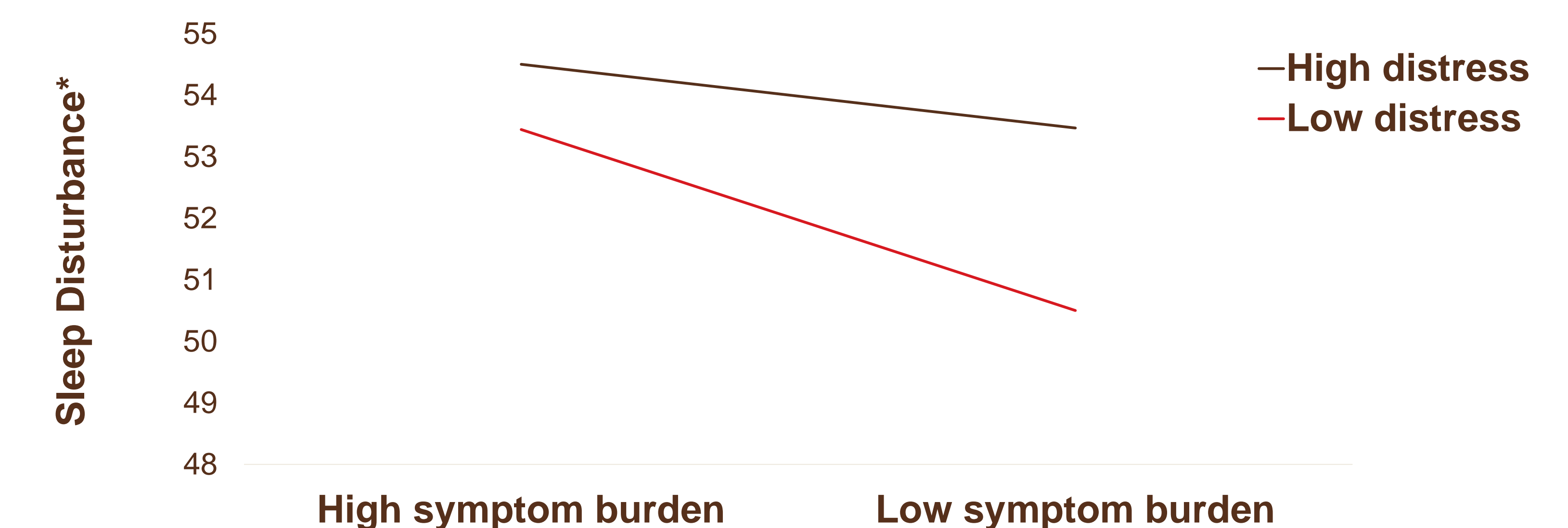
Predictor	t	B	p
Physical Symptom	2.38	.31	<.05
Psychosocial Distress	2.44	.11	<.05
Age	-2.24	-.10	<.05

(F(214)=5.43, R²=.16, p<.000)

* Significant Associations Only Displayed

- Results of the multivariate analyses revealed that physical symptom burden and psychosocial distress were independently and positively associated with sleep disturbance ($p < .05$)
- In other words, greater physical symptom burden and higher levels of distress were linked to elevated sleep disturbance, after controlling for sociodemographic and clinical variables

Interaction Between Physical Symptom Burden and Psychosocial Distress on Sleep Disturbance



* Predicted Continuous T-score on the Promise-29v1.0 on the Sleep Disturbance Subscale

- Additionally, when the interaction between physical symptom burden and psychosocial distress was added to the multivariate model, the interaction was statistically significant ($p = .05$). That is, the degree to which MM symptom burden is linked to sleep disturbance depends on psychological distress
- Sleep disturbance is intensified for individuals living with MM when physical symptom burden is accompanied by distress
- Overall, our results point to the important interplay of physical and psychological health for sleep

Implications and Conclusions

- In the presence of physical symptom burden, sleep disturbance is exacerbated for individuals with psychosocial distress
- Clinicians should consider screening for and addressing psychosocial distress when addressing sleep disturbance, particularly among those patients who also report physical symptoms
- Assessing both physical and psychosocial symptoms will inform more comprehensive symptom management. We recommend referrals to inter-disciplinary teams with specialists that address both physical and psychosocial concerns

Acknowledgments

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References

- Mystakidou, K., et al. (2007). "The relationship of subjective sleep quality, pain, and quality of life in advanced cancer patients." *Sleep* 30(6): 737-742.
- Coleman, E. A., et al. (2011). "Fatigue, sleep, pain, mood, and performance status in patients with multiple myeloma." *Cancer Nurs* 34(3): 219-227.
- Zaleta, A. K., et al. (2017). "Multiple myeloma symptom burden, perceived control, and quality of life: Findings from the Cancer Experience Registry." *Blood* 130(Suppl 1): 5629.