Characterizing Sleep Disturbance Based on Text Messages of Suicide Attempt Survivors

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INTRO

- Sleep disturbance is a modifiable risk factor for suicidal thoughts and behaviors (STBs).
- Digital signatures of sleep disturbance may aid in the assessment of sleep problems, and by proxy, STBs.

METHODS

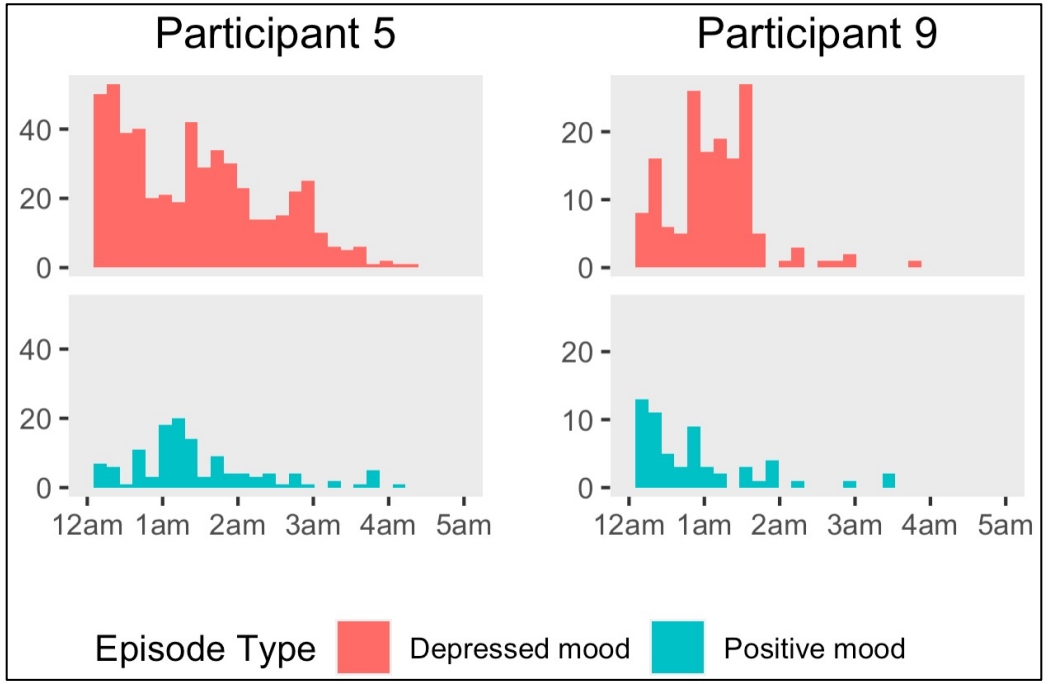
- *N* = 26 suicide attempt survivors identified 2-week past episodes of positive mood, depressed mood, or suicidal ideation and 2-week periods leading up to an attempt.
- Participants provided personal texts from these episodes.
- Linguistic Inquiry Word Count was used to identify sleep-related words and phrases used in text messages.
- Generalized multilevel models were used to examine differences in episode type and sleep disturbance feature: (1) sleep-related communication; 2) number of texts sent during midnight – 5:00 AM window; 3) spread of outgoing texts across midnight – 5:00 AM window.
- **Preregistered Hypotheses:** Sleep-disturbance indicators (e.g., number of texts where someone conveys they are struggling with sleep) will increase in tandem with increasing suicide risk: https://osf.io/9f3v2/.

RESULTS

- The first set of analyses yielded no significant differences in sleep-related indicators across episodes type.
- After the sleep word list was revised for accuracy, sleep-related communication was more likely in depressed-mood episodes than positive-mood episodes.
- There were no other significant differences in sleep indicators across episode types.

Suicide attempt survivors texted about sleep more during prior 2-week periods where they felt depressed, compared to prior 2-week periods where they were feeling positively, but no differences in sleep disturbance indicators were found across suicidal episodes

Difference in number of outgoing texts from midnight – 5:00 AM across positive mood and depressed mood episodes for n = 2 participants



Revised LIWC Custom Sleep Dictionary

Root words	Multi-word phrases
Insomnia	In bed; Go to bed
Snor*	Passed out; Pass out
Doz*	Can't sleep; Cant sleep
Ambien	Couldn't sleep; Couldnt sleep
Lunesta	Not sleep*
Asleep	Didn't sleep; Didnt sleep
Wiped	Try to sleep
Nightmare	Wanna sleep; Want to sleep
Nyquil	Get some sleep
Melatonin	Need sleep
Trazodone	Haven't slept; Havent slept
Slumber	Still up; Still awake
Dream*	Wiped out
Collapse	U awake; You awake
Blackout	Up late; Up all night
Groggy	Lay down
	Hit the hay
	Nodding off; Nod off
	I have to be up
	Woke up

Note. Asterisks indicate word-stems in LIWC

DISCUSSION

- Though we did not detect differences in sleep-related communication tied to STBs, secondary analyses showed sleep-related communication was more likely during depressed than positive mood episodes.
- Future studies would benefit from recruiting a larger *N* and leveraging multiple indices of wakefulness (e.g., wearable sensors; phone on/off activity).

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