

# Testing Interoceptive Dysfunction as a Mediator between Sleep Disturbances and Suicidal Ideation among Military Service Members

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Suicide among military service members (MSM) is a major public health problem. Veterans are at increased risk for suicide compared to non-veterans (Kaplan et al., 2012; McCarthy et al., 2009). Additionally, the suicide rate for active-duty service members has become comparable to that of the general population following sharp increases in recent years (Pruitt et al., 2019). Public health entities such as the Veterans Health Administration have taken steps to reduce the burden of suicide among MSM, but the need to identify factors that confer risks for suicidality among MSM is still significant. Thus, the current study attempted to identify two potential risk factors/mechanisms for suicidality among MSM: insomnia severity and interoceptive dysfunction. Interoception is defined as the central nervous system's ability to monitor and notice signals coming from the body. Likewise, dysfunctional interoception can occur whenever external factors hinder one's ability to accurately assess such signals. Interoceptive dysfunction influences various psychopathologies, and insomnia is a known risk factor for suicidality among MSM (Forrest et al., 2015; Troxel et al., 2015). These constructs may work conjointly to predict suicidality among MSM. Specifically, interoceptive dysfunction may underlie the relationship between insomnia severity and suicidal ideation. Individuals with sleep difficulties may have difficulty perceiving their internal sensations, as a result of poor sleep quality. This interoceptive dysfunction may culminate in suicidal thoughts, given the well-established link between decreased interoception and suicidality. Therefore, we investigated longitudinal relationships between interoceptive dysfunction, insomnia severity, and suicidality among a sample of MSM. We hypothesized interoceptive dysfunction to act as a mediator between insomnia severity and suicidal ideation.

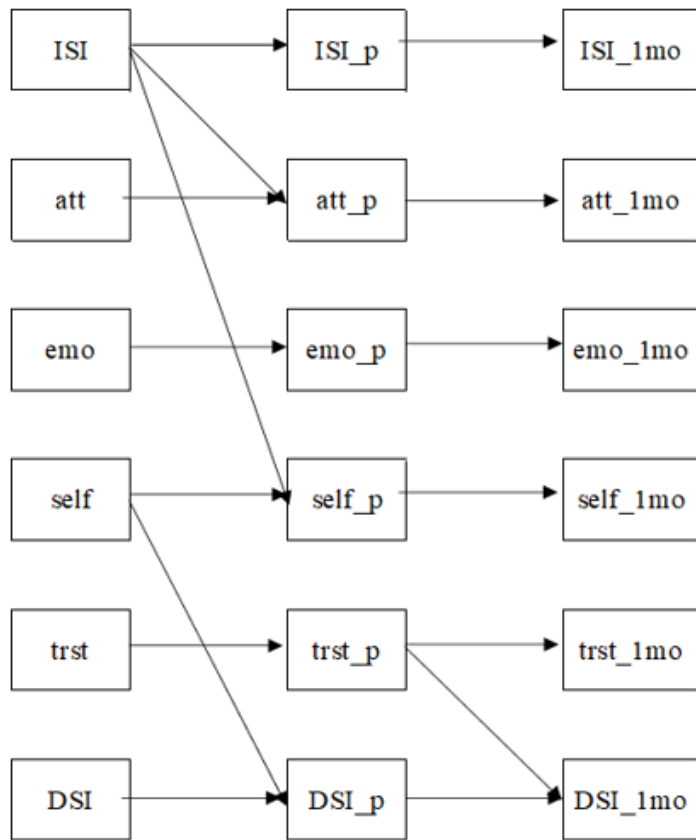
For this study, archival data were collected from 195 MSM enrolled in a randomized control trial meant to reduce suicidality among MSM. Participants completed self-report surveys at three timepoints separated by one month each that measured suicidal ideation, insomnia severity and interoceptive awareness (4 subscales included). Analyses focused on a 3-timepoint longitudinal autoregressive cross lagged mediation model using MPlus. Longitudinal paths from insomnia severity to interoceptive dysfunction, interoceptive dysfunction to suicidal ideation, and insomnia severity to suicidal ideation were estimated, each separated by one timepoint. In addition, formal tests of mediation of insomnia severity to suicidal ideation by interoceptive dysfunction were conducted.

Results of this model are presented in Figure 1. Insomnia severity significantly predicted interoceptive dysfunction over time, while interoceptive dysfunction predicted increased suicidal ideation over time. Interoceptive dysfunction did not mediate relationships between insomnia severity and suicidal ideation. Significant relationships between insomnia severity and interoceptive dysfunction suggest that insomnia severity may be a risk factor for interoceptive dysfunction in that poor sleep quality may lead to reduced ability to recognize bodily sensations. Furthermore, our results replicate previous research (Forrest et al., 2015) by highlighting that disconnection from one's bodily sensations increases suicide risk.

Given our results, we recommend assessing for both interoceptive dysfunction and insomnia severity as potential risk factors for suicidal ideation among MSM. Furthermore, results suggest that interoceptive dys-

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function may be a promising intervention target to reduce suicidality among MSM. Clinicians may consider improving interoceptive abilities by utilizing mindfulness, exposure, and cognitive-behavioral techniques.



**Fig. 1** Significant effects observed from the model. ‘p’ = post, ‘1mo’ = 1 month timepoint. ‘ISI’ = Insomnia Severity Index Scores, ‘att’ = MAIA “attention” subscale, ‘emo’ = MAIA “emotional regulation” subscale, ‘self’ = MAIA “self-regulation” subscale, ‘trst’ = MAIA “trusting” subscale, ‘DSI’ = Depressive Symptom Index suicidality subscale scores.

### Statement of Research Advisor

Walton Ferguson led the development of this project testing the relations between sleep disturbances, interoception, and suicidality among military service members (MSM). Under the supervision of graduate student, Will Grunewald, Walton learned how to conduct and interpret the longitudinal path analyses for this study. These results can inform clinical assessments and interventions for MSM.

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### References

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### Authors Biography



Walton Ferguson is studying Psychology and Statistics at Auburn University. He intends to pursue graduate studies in Psychology. His research interests include learning, neuroplasticity, and interoception and currently has one publication with the REDS lab.



Will Grunewald is a third-year clinical Psychology PhD student at Auburn University. His research interests include identifying risk factors for disordered eating, body image disturbance, and suicidality, with a particular emphasis on these risk factors among vulnerable populations. He also studies the overlap between conformity to masculine norms and Muscle Dysmorphia.



Dr. Smith is currently an Assistant Professor of Psychology at Auburn University and the director of the Research on Eating Disorders and Suicidality (REDS) Laboratory. She received her B.A. in Psychology and Plan II from the University of Texas at Austin in 2004. She received her Ph.D. from Florida State University's Clinical Psychology Program in 2012, and completed her clinical residency at the University of California, San Diego.