to assessment (median (IQR) = 5.5 (2.0-11.3) months). Participants completed the Brain Injury Recovery Disposition Scale (BIRDS) to assess FA and END behaviors, and Sport Concussion Assessment Tool (SCAT5) Symptom Inventory. A BIRDS spectrum score was calculated as the difference between FA and END scores to determine individual coping behavior on a spectrum from extreme FA (more negative) to extreme END (more positive). SCAT5 symptoms were separated into four domain scores: somatic, cognitive, sleep, and emotion. Regressions were performed for each outcome examining their potential linear and quadratic associations to coping behavior (i.e., BIRDS spectrum score). Follow-up regressions were performed covarying for age and sex to explore the potential influence of these variables on each outcome.
Results: The linear and quadratic components of the BIRDS spectrum score were not significantly related to total number of persisting concussive symptoms. For overall total symptom severity, the quadratic component of the relationship was significant (B = .24, p = 0.04). Visualization of the overall trend line suggested that symptom severity was highest on the extreme FA side of the BIRDS spectrum (highly negative BIRDS spectrum score), decreased as coping behavior become more balanced (BIRDS spectrum score surrounding “0”), plateaued, then increased abruptly on the extreme END side (highly positive BIRDS spectrum score). For cognitive symptoms, the linear component of the BIRDS spectrum score was significant (B = -.28, p = 0.02) and the quadratic component was marginally significant (B = .22, p = 0.06). The quadratic (but not linear) component was significantly related to both the severity of sleep (B = .31, p = 0.01) and emotion symptoms (B = .25, p = 0.03). Finally, neither the linear nor quadratic components were significantly related to the somatic symptom severity. After covarying for age and sex, the quadratic component remained significant for total symptom severity (p = 0.05) as well as the linear component for cognitive severity (p = 0.02).
Conclusions: Both extreme “fear avoidance” and “endurance” coping styles may be related to more severe chronic mTBI symptoms, especially in domains of sleep and emotion symptoms. Patients with balance of both fear avoidance and endurance behaviors may be more likely to experience less severe symptoms even among mTBI patients with persistent complaints. Identifying coping behavior styles early after mTBI could improve prognostication and help with developing personalized treatment plans to improve patient recovery. Future research with larger sample sizes should further examine the influence of age and sex on the relationship between coping behavior and symptom severity.

Categories: Concussion/Mild TBI (Adult)
Keyword 1: concussion/ mild traumatic brain injury
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55 The Association of Prior Concussion and Subjective Sleep Quality in Young Adult Athletes

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Objective: There is rising concern over the potential cumulative and long-lasting effects of prior concussions in active and retired athletes. Previous studies suggest that there is an inverse relationship between concussion (or mild traumatic brain injury) and sleep, with increasing evidence of individuals reporting chronically disrupted sleep following remote concussion. The extent to which these effects are cumulative across repeat concussions is unknown. This project aimed to investigate the association between the number of prior concussions and subjective sleep quality in otherwise healthy collegiate-aged athletes. Furthermore, we investigated which aspects of sleep are most associated with prior concussion.
Participants and Methods: A total of 176 collegiate-aged athletes (M_{age} = 21.19, SD = 1.63; 65.9% men) completed off-season clinical visits, at least 6 months since their most recent concussion. Semi-structured interviews captured detailed sport and head injury history across the lifespan. The number of prior concussions for each participant was retrospectively assessed based on American Congress of Rehabilitation Medicine criteria. Subjective sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI). A general linear model tested the relationship between number of prior concussions and global PSQI score (i.e., overall

https://doi.org/10.1017/S135561772300259X Published online by Cambridge University Press

sleep quality). Logistic regression models were fit to investigate the association of the number of prior concussions with individual sub-components of the PSQI (i.e., quality, latency, duration, efficiency, disturbances, use of sleep medications, and daily dysfunction), which were binarized based on their distribution. Sex and total number of years of exposure to contact sports were included as covariates for all models.
Results: The number of prior concussions was significantly associated with worse overall sleep quality as assessed by the global PSQI score, F(3,172)=6.92, p= <0.001, unstandardized beta[B](standard error[SE])=0.54(0.14). Investigation of sub-components showed that the number of prior concussions was significantly associated with multiple PSQI sub-components, including: poorer sleep quality, odds ratio [OR]=1.35, 95% CI [1.05, 1.74], p=0.02; longer sleep latency, OR=1.35, 95% CI [1.08, 1.68], p=0.008; more sleep disturbances, OR=1.56, 95% CI [1.15, 2.12], p=0.004; and more sleep-related daily dysfunction, OR=1.46, 95% CI [1.16, 1.83], p=0.001. The number of prior concussions was not significantly associated with sleep duration, sleep efficiency, or the use of sleep medication (ps>0.05). There were no years of exposure effects (ps>0.05). Select sex-related effects on sleep quality were observed. Specifically, women reported significantly worse global sleep scores, F(3,172)=6.92, p=0.048, B(SE)=-0.99(0.50), and women reported significantly more sleep disturbances, B(SE)=1.47(0.70), p=0.04, OR=4.34 (95% CI [1.11, 16.98].
Conclusions: These results suggest a potential dose-effect of concussion history on poorer sleep quality ratings in otherwise healthy athletes. Specific facets of sleep that were adversely associated with prior concussion included sleep quality, latency, disturbances, and daily dysfunction, highlighting potential areas for sleep-related clinical interventions. Given the adverse effects of chronic sleep disturbance on mental health, future studies are needed to determine the role of concussion-related sleep problems in the adverse psychological outcomes observed in some athletes with multiple prior concussions.

Categories: Concussion/Mild TBI (Adult)
Keyword 1: concussion/ mild traumatic brain injury
Keyword 2: sleep

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56 Investigating the Moderating Effect of Family Psychiatric History on the Association Between Concussion History and Elevated Symptom Endorsement

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Objective: Prior research has found that a greater history of concussion is associated with subtle increases in symptom endorsement. Recent work indicates that a family history of psychiatric disorder is a potential risk factor for prolonged recovery following a single injury. While greater symptom endorsement is observed among those with a personal psychiatric history, the potential role of family psychiatric history in elevated symptom endorsement in the context of repeated concussion has not been investigated. Therefore, the objective of this work was to determine whether family psychiatric history moderates the association of concussion history and elevated symptom endorsement in active collegiate athletes.
Participants and Methods: A total of 176 (mean age = 21.19 ± 1.63; 116 male) collegiate athletes completed this study at the Medical College of Wisconsin. Participant's family psychiatric history was collected through a modified Family History Screen (FHS) regarding the participant's biological parents, siblings, and children, focusing on questions relating to major depressive disorder (MDD; 3 total questions) and general psychiatric history (5 total questions). Concussion history was assessed through a semi-structured interview using American College of Rehabilitation Medicine criteria for mild traumatic brain injury. Concussion symptoms were measured via the Sport Concussion Assessment Tool (SCAT-5) and psychological distress was assessed using the Brief Symptom Inventory-18 (BSI-18). General linear models tested the association of the number of prior concussions with log-transformed SCAT-5 and BSI-18 scores. Additional general linear models were fit to

https://doi.org/10.1017/S135561772300259X Published online by Cambridge University Press