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Athletic Trainers' Familiarity with Potential Concussion Biomarkers: A Descriptive Study

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Introduction: An estimated 3.8 million individuals sustain a concussion annually in the United States. Despite the high number of cases, this number may not accurately depict the true incidence rate due to underreporting of symptoms by patients. With current concussion tools relying heavily on subjective input from patients, it is imperative that a valid and reliable objective tool, such as a clinical biomarker, is identified to improve concussion diagnosis and management. If such a biomarker is identified, it will be essential that athletic trainers (ATs) be familiar with how biomarkers could be used. The purpose of this study was to determine ATs' familiarity with potential concussion biomarkers. **Methods:** An online, cross-sectional survey that included six demographic questions. Three content experts were solicited to establish the content validity of all survey items by scoring each item's relevancy to the overall research question, and a mean content validity index of 0.9 was established for the overall instrument. The survey was distributed to 1,000 ATs biweekly for eight weeks through the NATA Research Survey Service (response rate: 6%). Additional participants were recruited through social media, resulting in a total of 238 ATs who submitted the survey. Participants were asked to identify biofluids and biomarkers they were familiar with (two questions) and were also asked to rate their knowledge of the literature on biomarkers for both concussion diagnosis and management using Likert-scales (extremely knowledgeable, very knowledgeable, moderately knowledgeable, slightly knowledgeable, not knowledgeable at all). Participants were asked to answer all questions but were not required to answer all questions to submit their responses. We used descriptive statistics to summarize participants' demographics and responses to familiarity questions. **Results:** Of the 238 ATs that submitted surveys, varying numbers responded to each of the questions: familiarity with biomarkers (n=214), familiarity with biofluids (n=216), self-rated knowledge of literature for concussion diagnosis biomarkers (n=215), and self-rated knowledge of literature for concussion management biomarkers (n=216). When identifying biomarkers they were familiar with, ATs were most often familiar with protein (30.4%, n=80) and least often familiar with DNA (3.7%, n=8). Relative to biofluids, ATs were most often familiar with blood (37.5%, n=110) and least often familiar with urine (3.2%, n=7). Interestingly, 55.4% (n=119) of ATs stated that they had "No knowledge at all" of the current literature regarding the use of biomarkers for concussion diagnosis, and 62.0% (n=134) stated they had "No knowledge at all" of the current literature regarding biomarkers used for concussion management. (Figure 1.) **Translation to Practice:** Despite the increase in research attempting to identify a concussion biomarker, ATs remain unfamiliar with biomarkers and biofluids. Targeted continuing education efforts are needed to familiarize ATs with biomarkers and biofluids that will likely be used in the diagnosis and management of concussions in the future.

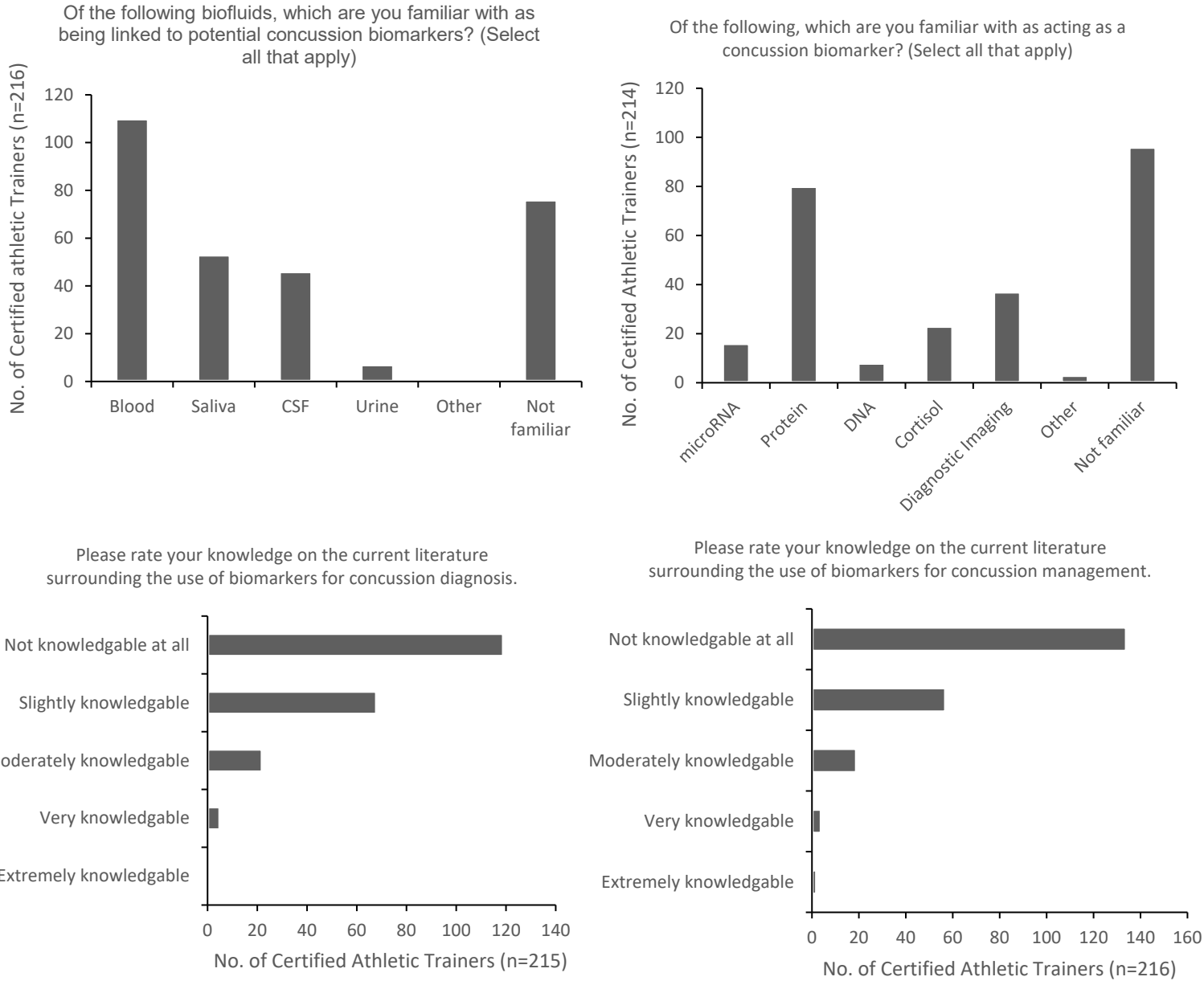

Figure 2. Most familiar biofluids and biomarkers as reported by athletic trainers and self-reported knowledge of biomarker use for concussion diagnosis and management.