Can my smartphone tell what I had to drink last night? Systematic review of the measurement properties of smartphone based approaches to assess alcohol use

LOUISE THORNTON[1], BRIDIE OSMAN[1], KATRINA CHAMPION[1], OLIVIA GREEN[1], ANNIE B WESCOTT[2], LAUREN GARDNER[1], COURTNEY STEWART[3], RACHEL VISONTAY[1], JESSE WHIFE[3], BELINDA PARMENTER[4], LOUISE BIRRELL[1], ZACHARY BRYANT[1], CATH CHAPMAN[1], DAVID LUBANS[5], TIM SLADE[1], JOHN TOROUS[6], MAREE TEESSON[1] AND PEPIJN VAN DE VEN[7]

[1] The Matilda Centre, The University of Sydney, Sydney, NSW, Australia
[2] Galter Health Sciences Library & Learning Center, Northwestern University Feinberg School of Medicine, Chicago, IL, US
[3] National Drug Research Institute, Curtin University, Perth, WA, Australia
[4] School of Health Sciences, The University of New South Wales, Sydney, NSW, Australia
[5] Priority Research Centre for Physical Activity and Nutrition, The University of Newcastle, Newcastle, NSW, Australia
[6] Beth Israel Deaconness Medical Centre, Harvard Medical School Boston, MA, US
[7] Health Research Institute, University of Limerick, Limerick, Ireland

Presenter's email: *Louise.Thornton@sydney.edu.au*

Introduction: Accurate and low burdensome measurement of alcohol use is important to successful behaviour change. Smartphones have the potential to provide a real-time, unobtrusive and cost-effective way to measure alcohol use and deliver feedback. Despite this, the validity of using smartphones to measure alcohol use is largely unknown. We aimed to identify existing smartphone-based approaches to measure alcohol use and critically appraise the quality of their measurement properties.

Method: A systematic search was conducted. Studies measuring alcohol use via smartphone, and reporting at least one measurement property (e.g. validity, reliability) were included.

Key Findings: Sixteen studies describing the measurement properties of smartphone-based approaches to measure alcohol were identified, describing eight measurement techniques. Techniques included self-report approaches (e.g. recording alcohol use in a mobile-app in real-time), approaches where participants actively provided an objective measure of their behaviour (e.g. tests of psychomotor performance assessing alcohol induced impairment), and approaches where data was collected without the active involvement of users (e.g. using sensors to detect gait and infer alcohol intoxication). The methodological quality of studies varied widely.

Discussions and Conclusions: This world first review found some evidence to support the reliability and validity of using smartphones to assess alcohol use. Included studies provided good evidence for the validity of daily and real-time self-reporting of alcohol use via smartphones and promising initial findings for other approaches. More high-quality studies validating smartphone-based approaches against criterion measures, involving larger samples and research investigating objective measurement approaches are needed.

Implications for Practice or Policy (*optional*)**:** *Many people already use apps to track behaviours like alcohol use. It is often difficult to identify safe, evidence-based apps in the crowded marketplace. We provide evidence-based recommendations to clinicians regarding types of smartphone tools they might consider using in their practice to accurately measure and feedback clients' alcohol use.*