Transdermal monitors to assess alcohol consumption in real-time and real-life: A qualitative study on user-experience
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Centre for Alcohol Policy Research (CAPR)
APSAD Conference, 5 November 2018

How to collect alcohol-related data from humans?
Questionnaire-based research

- Very time and cost-efficient
- However, estimates may fail to reproduce the total per capita alcohol consumption compared to sales statistics
- Reason: Recall bias due to memory deficits, i.e. people tend to remember only a part of what they have consumed

Are you Drunk?
☐ Yes
☐ No  X
Alcohol consumption assessed retrospectively (30 days) and in the evening cell phone study.


How to Measure Consumed Amounts Precisely?


High precision scales (error margin < 0.1 grams)
Collecting data in ‘the wild’: Street / bar intercept studies, e.g. using Breathalysers

😊 No recall bias, high ecological validity, but...

😊 Labor & cost intensive
😊 Limited number of locations
😊 Small samples
😊 Limited number of assessments

Transdermal alcohol measurement

People excrete approximately 1% of consumed alcohol through their skin as insensible perspiration.

This enables:

😊 Objective measurement, no recall bias
😊 Continuous measurement over time (e.g. each 30 minutes)
😊 Non-intrusive, passive measurement, no user action required
😊 No response burden, i.e. convenient for both participants and researchers
The Secure Continuous Remote Alcohol Monitor (SCRAM™)

The SCRAM is an ankle bracelet incorporating a small pump that takes readings every 30 minutes (making a small vibration whilst doing so)

😊 SCRAMs can be worn continuously for several months without battery change; all readings are date- and time-stamped

😊 The company has more than 10 years of experience in transdermal alcohol measurement

Design for convicted offenders on compliance orders
Priority: robustness, theft, tamper-proofing features and a rigid locking mechanism

😊 Participants report discomfort and public embarrassment

Our present work: Qualitative studies on the experience of wearing SCRAMs in natural drinking environments

Recruitment of two samples of young adults in south-east Australia in early 2018:

❖ Attendees of a music festival (three nights, four days); 7 women and 5 men, mean age = 23.3 (range 18-29)

❖ Metropolitan residential college students during orientation week; 9 women & 9 men, mean age = 19.5 (range 18-22)

Framework analysis based on transcribed interviews
Results: Perceptions of the device, social experiences

😊 “sturdy”, “bulky”, “heavy”, “chunky”

😊 Participants noted similarities to house arrest monitors

😊 “I was a little bit worried also that maybe the bars wouldn’t want us coming in if we had like a research thing on”

😊 Increased engagement with other festival attendees due to the device opening up positive social interaction that would not otherwise have occurred

😊 Some reported developing amusing stories about having a criminal history, feeling it was a useful ice-breaker and “a good conversation starter”

Results: Drinking Experiences

😊 The majority of participants ($n_{total} = 24, 80\%$) reported that their drinking patterns were not affected by wearing the SCRAM

❖ Several participants ($n_{college} = 6, 33\%$) reported being more aware of their drinking patterns

😊 Two festival participants felt obliged to drink more than usual for the research “just to create some data”
Results: Physical Experiences

The physical experience varied greatly between individuals and activities

❖ Most found the SCRAM’s clamping mechanism awkward creating “pressure”, “tightness” and felt “constricting”, “pretty painful”

❖ Over half ($n_{total}=17, 57\%$) said they got used to the initial awkwardness (“it really just was an extension of the leg after the first few hours”); only became aware when their attention was drawn to it

❖ Running/sports and sweating shift the SCRAMs into less comfortable positions, increased swelling, or increased friction with the ankle.

❖ Researchers made adjustments: the use of tube socks, plasters, medical tape employed to reduce rubbing and “stabilise” the device

Conclusion

❖ The ability to continuously monitor alcohol consumption in naturalistic settings in a non-intrusive way is incredibly valuable

❖ Although not designed for research purposes, the SCRAMs proved to be a useful tool for measuring consumption during drinking events without apparent performance bias

❖ SCRAMs are relatively expensive and bulky

❖ Discomfort was commonly noted and has to be addressed to ensure that it does not interfere with or limit future research through attrition and added participant burden
Thank you

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