

Accuracy, acceptability, and feasibility of transdermal alcohol sensors: Two systematic reviews

Eileen Brobbin, PhD candidate at King's College London

Supervisors: Dr Deluca, Prof Drummond, Dr Parkin



What are transdermal alcohol sensors?

[SCRAM by SCRAM Systems](#)



[Skyn by BACtrack](#)



WrisTAS by Giner Inc.



[Milo by ION sensors](#)



Background Prospero: CRD42021231027

1. Accuracy systematic review

This systematic review aims to assess the accuracy of current available transdermal alcohol sensors.

2. Acceptability and feasibility systematic review

This systematic review aims to assess the acceptability and feasibility of current available transdermal alcohol sensors.

Databases: CINAHL, EMBASE, MEDLINE, PsychInfo, PubMed, Scholar, Scopus (searched Feb 2021).

Inclusion criteria: Full text, original studies, written in English, using a wearable transdermal alcohol sensor reporting accuracy, acceptability or feasibility outcomes.

Published on 14.4.2022 in Vol 24, No 4 (2022): April

Preprints (earlier versions) of this paper are available at <https://preprints.jmir.org/preprint/35178>, first published November 24, 2021.



Accuracy of Wearable Transdermal Alcohol Sensors: Systematic Review

Eileen Brobbin¹; Paolo Deluca¹; Sofia Hemrage¹; Colin Drummond¹

Brobbin, E., Deluca, P., Hemrage, S., & Drummond, C. (2022). Accuracy of wearable transdermal alcohol sensors: systematic review. *Journal of medical Internet research*, 24(4), e35178.

eileen.brobbin@kcl.ac.uk

Currently accepted at: [JMIR Human Factors](#)

Date Submitted: Jun 10, 2022

Date Accepted: Nov 7, 2022

Tweet

This paper has been accepted and is currently in production.

It will appear shortly on [10.2196/40210](#)

The final accepted version (not copyedited yet) is in [this tab](#).

Preprint

Accepted
Manuscript

Acceptability and feasibility of wearable transdermal alcohol sensors: A systematic review

Eileen Brobbin; Paolo Deluca; Sofia Hemrage; Colin Drummond

Brobbin E, Deluca P, Hemrage S, Drummond C. Acceptability and feasibility of wearable transdermal alcohol sensors: A systematic review. *JMIR Human Factors*. 07/11/2022:40210 (forthcoming/in press)



LISBON
ADDICTIONS
2022

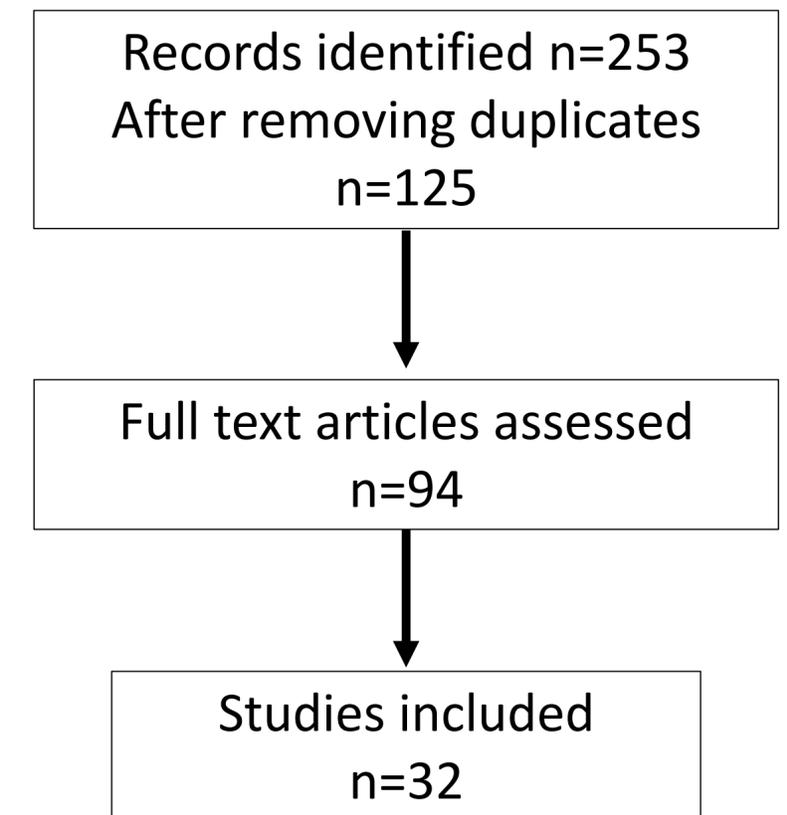
Accuracy of transdermal alcohol sensors: Systematic review

Number of papers on each device:

SCRAM (19), WristAS (7), BACtrack Skyn (5), ION Milo (1), Quantac Tally (1), wearable IoT sensor (1), MOX (1), PEM fuel cell sensor (1), unnamed (1).

Population characteristics:

29 papers (90.6%) used adults in good health, 3 (9.4%) included diagnosed alcohol-dependent clinical population. There were 1228 participants enrolled in total, and 1147 included in the procedure/analysis, = 81 withdrew or had missing data (6.6%).



Accuracy of transdermal alcohol sensors: Findings

- Devices were generally found to positively correlate with BrAC, BAC and self-report (moderate to high correlations).
- WrisTAS (8%) and BACtrack (16-38%) report higher malfunctions and noise compared to SCRAM (2%).
- WrisTAS (30 minutes post peak BrAC, $p < .02$) and BACtrack (24 minutes, $p < .001$) report reduced time lag to peak values compared to SCRAM (69 minutes, $p < .001$).
- Most studies include healthy volunteers, not alcohol-dependent individuals.
- The wear time of the device lasted from a day to a few weeks, with the majority within laboratory settings.

Acceptability and feasibility of transdermal alcohol sensors: Systematic review

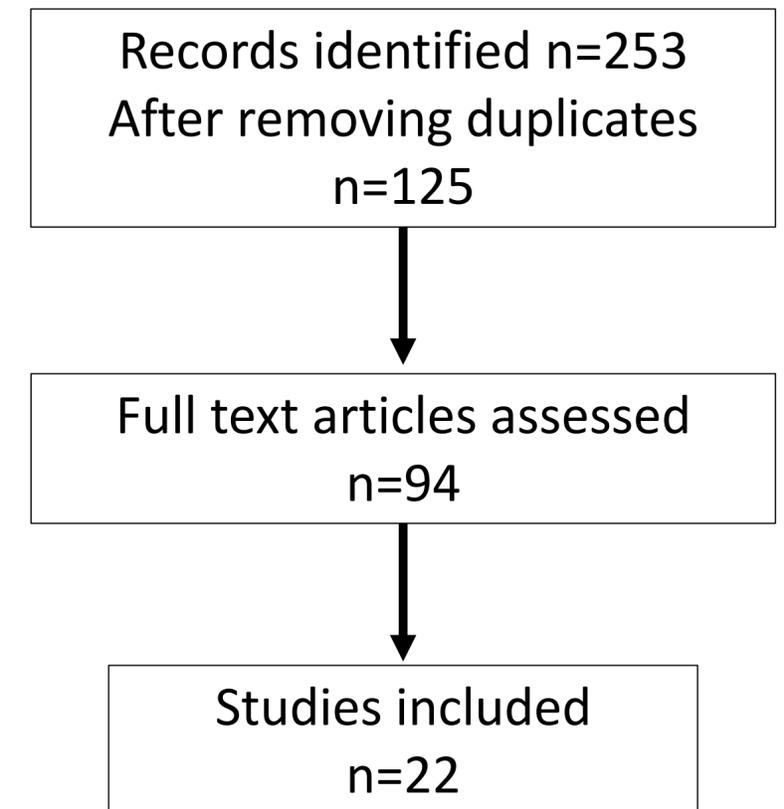
Number of papers on each device:

SCRAM (16), WrisTAS (4), BACtrack Skyn (3), Quantac Tally (1).

Papers with a specific aim on acceptability, adherence and feasibility: 8 (36.4%)

Population characteristics:

18 papers (81.8%) used adults in good health, 4 (18.2%) included diagnosed alcohol-dependent clinical population. There were 821 participants enrolled in total, and 793 included in the procedure/analysis, = 28 withdrew or had missing data (3.4%).



Acceptability and feasibility of transdermal alcohol sensors: Findings

- We found a mix of study designs laboratory, ambulatory, mixed designs, RCTs and focus groups.
- Devices worn ranged in the length of time from days to weeks.
- There was a lack of research specifically investigating the acceptability and feasibility of TAS. No study specifically defined acceptability and feasibility in terms of their research.
- From the data included, views on transdermal alcohol sensors were generally positive with high compliance.

Suggestions: Smaller size device, waterproof, improved comfort, adjustable straps, more notifications and information for the wearer, longer battery life, use of motion/environment sensors to corroborate output.



-> Brobbin, E., Deluca, P., Hemrage, S., & Drummond, C. (2022). Accuracy of wearable transdermal alcohol sensors: systematic review. *Journal of medical Internet research*, 24(4), e35178.

-> Brobbin, E., Deluca, P., Hemrage, S., & Drummond, C. (2022). Acceptability and feasibility of wearable transdermal alcohol sensors: systematic review. *JMIR Human Factors*, *accepted*.

