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Humanoid-human Collaboration in Understanding Implications of Driving Under Influence of Drugs: Systematic Review Versus Artificial Intelligence

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Abstract

This research involved co-creating a systematic review analysis alongside the world's smartest humanoid robot, Ami. The work involved a human-humanoid collaboration in understanding driving under the influence of drugs' (DUIDs') prevalence, implications and chemical analysis. The systematic review was conducted according to the preferred reporting items for systematic reviews and meta-analysis guidelines. Quantitative studies reporting drugs encountered in DUID published between 2007 – 2025 were included. Studies that had no confirmatory chemical analysis were excluded. Included studies ($n = 25$) were analysed independently by researchers and integrated into Ami's knowledge-based system. Ami deployed large language models for analysis but often needed prompt to extract information. The results showed similarity in extraction between the systematic review and the humanoid analysis. Both approaches confirmed key drugs reported in DUID were alcohol, cannabinoids, cocaine, amphetamine, benzodiazepines, and opiates. Such drugs were often detected in blood and urine and less occasionally in oral fluid. Key techniques employed for their analysis were immunoassay, gas chromatography-mass spectrometry, and liquid chromatography-mass spectrometry, where the latter was the most sensitive technique. Implications of these drugs on driving included impairment, increased risk of accidents, with fatal accidents less frequent but more severe. No AI hallucinations were encountered in Ami's answers; yet, examples were used from outside the studies integrated into the knowledge-based system. This showed that the humanoid is integrating experience and knowledge from other sourcing and adapting them in the present study. In summary, the humanoid offered a valuable and quick tool in analysis and can support healthcare research.

Keywords Humanoid robot · Driving under influence of drugs · Systematic review · Healthcare research · Ami · Artificial intelligence

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Data Availability No datasets were generated or analysed during the current study.

Declarations

Ethical Approval and Consent to Participate The project did not require any ethical approval upon checking with LJMU ethics tool.

Consent for Publication Not applicable.

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Competing interest The authors declare no competing interests.

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