

DESIGNING LIVERCARE AI: AN INTELLIGENT DIGITAL HEALTH PLATFORM FOR SELF-MANAGEMENT AND PREVENTION OF LIVER CIRRHOSIS

Background

Liver Cirrhosis remains one of the public health crises that significantly increases morbidity and mortality rates globally. In the UK, liver cirrhosis causes approximately 4000 deaths annually, while around 700 patients require a liver transplant to survive (NHS Inform, 2026).

- This disease is largely driven by excessive alcohol consumption, hepatitis B and C infection, and obesity.
- Another report shows that the mortality rate from liver diseases in England rose by 21.4% in 2022 (GOV.UK, 2024).

Therefore, as this disease creates significant concern, an appropriate public health intervention is required to minimise the severity of liver cirrhosis diseases and its associated causes.

In particular, regardless of its medical fallout, Liver Cirrhosis causes substantial pressures on the NHS through immediate and prolonged hospitalisation (LiverUK, 2023). For this reason, it demonstrates the need for early intervention and prevention healthcare strategies that encourage addressing long-term disease management.

- To manage liver cirrhosis several nondigital (conventional) approaches, such as alcohol cessation services, pharmacological treatments and liver function monitoring, have been integrated previously (Zheng et al., 2024).
- However, this intervention is highly dependent on face-to-face interaction and medical adherence, which limit its ability to detect disease symptoms earlier.

In terms of managing liver cirrhosis, digital technology like CirrhoCare has introduced a multi-modal remote monitoring system through smartphone applications and wearable devices (CirrhoCare, 2026). Continuous monitoring allows detection of liver disease deterioration with real-time patient data, which emphasises comprehensive clinical decision-making for healthcare professionals.

However, this existing technology creates significant challenges for older adults with limited digital literacy, while some patients also face language barriers that limit its effectiveness.

Therefore, considering the substantial public health crisis and the limitation of digital intervention highlighted the need for more comprehensive interventions like LiverCare AI. This poster is focused on proposing LiverCare AI, discussed in component 1, an AI-driven digital health intervention that integrates AI, personalised behavioural coaching, and medication reminders to support people with liver cirrhosis.

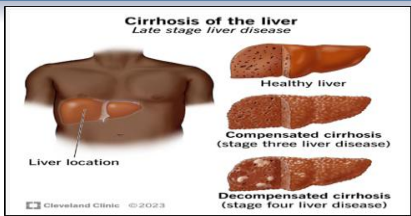


Figure1: Liver Cirrhosis (Source: Cleveland Clinic, 2026)

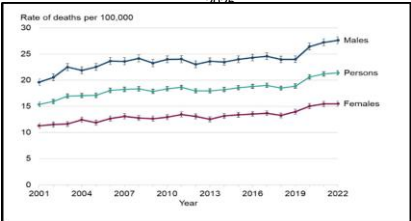


Figure 2: Mortality rate due to liver diseases (GOV.UK, 2024)

Health promotion values and principles

Health promotion encourages people to adopt healthy lifestyles, make informed decisions and prevent disease, which ultimately helps to manage long-term conditions like Liver Cirrhosis. In this matter, the core values of health promotion are equity, empowerment, and participation which ensure digital health interventions are accessible to all (WHO, 2026).

- Through personalised health coaching and medical reminders, LiverCare AI will develop patients' personal skills, aligning with the Ottawa Charter Principle for Health Promotion (WHO, 2026a).
- Additionally, by providing AI-driven recommendations for alcohol consumption, physical activity, and nutrition, LiverCare AI will allow patients to make informed lifestyle choices that encourage healthcare behavior and self-management, which highlights a supportive environment for patients.
- To promote equity, LiverCare AI will incorporate voice commands and multilingual interfaces and personalised accessibility features will enable patient's accessibility with digital literacy.
- In addition, this caregiver portal will facilitate family participation in medical adherence and the management of clinical appointments, which strengthen community action through collaborative approaches.
- By empowering patients, AI-driven remote monitoring technology will identify liver complications and predict risk, which allows timely intervention and reduces the chances of hospital admission (Tsvetanov et al., 2024).

Therefore, by facilitating AI-driven platforms, this intervention can support people with liver cirrhosis to predict risk factors through personalised behaviours and maintain their own health, which support enhancing quality of life. However, in spite of these advances in technology, inconsistencies in internet connectivity and digital skills may hamper equitable access for some people.

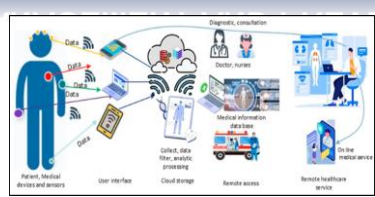


Figure 5: Integrating AI in Remote Monitoring (Source: Tsvetanov, 2024)

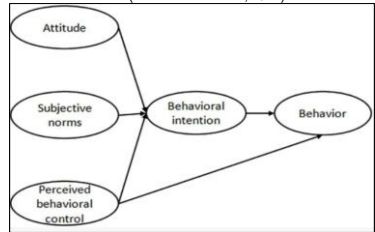


Figure 6: Theory of Planned Behaviour (Source: Lihua, 2022)

Behavioural change theory

Theory of Planned Behaviour (TPB) posits that patients change their intention towards healthy habits through a positive attitude, where LiverCare AI supports patients for long-term disease management (Lihua, 2022). This is broadly adopted in health promotion as it evaluates the way patients influence and shape their health-related decision-making.

- LiverCare AI can positively influence patients' attitudes by providing personalised behavioural coaching and education regarding nutrition consumption and sodium intake (Hallowick et al., 2025). With this platform, patients can understand the benefits of engaging with the interventions and adopting healthier lifestyles.
- Subjective norms will be enriched through the participation of healthcare professionals and caregivers in patient care through this digital intervention. This social encouragement can influence patients' intention to adhere to treatment and engage in durable self-management, which supports their health improvements.
- This digital platform will continuously monitor patients' daily activities and blood pressure, provide personalised lifestyle coaching and medication reminders, which reinforce the patient's perceived behavioral control by increasing their ability and confidence in terms of managing diseases independently (Lee et al., 2025).

Hence, using technologies such as smartwatches and mobile applications, LiverCare AI will influence patients' attitudes and intentions in terms of managing self-management and making informed decisions. Although TPB has several advantages in health promotion, patients with a lack of digital literacy and inadequate encouragement from health professionals can undermine the patient's intention and confidence in engaging with LiveCare AI.

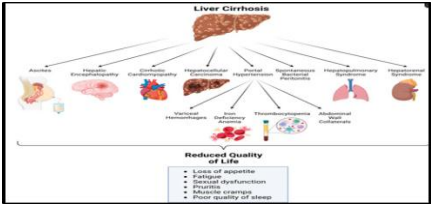


Figure 3: Liver Cirrhosis (Source: Fadlallah et al., 2025)

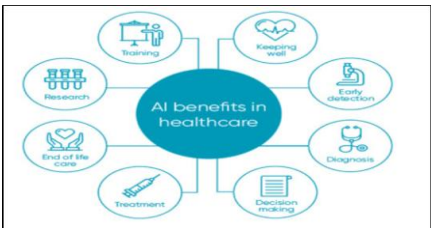


Figure 4: Benefits of AI in Healthcare (Source: Chaturvedi et al, 2025)

Expected outcome

With the integration of the Theory of Planned Behavior (TPB) into the LiverCare AI intervention, its expected outcome is to foster long-term lifestyle modification for people with liver cirrhosis. In particular, through personalised health education, such as alcohol reduction and nutrition intake, patients can understand the substantial advantages of adherence to LiverCare AI.

As a consequence of behavioral change, LiverCare AI will contribute to increasing patients' self-management through medical reminders and personalised recommendations.

With regular symptom monitoring and healthy dietary management, LiverCare AI will significantly empower patients to manage their own health and make more effective decisions about clinical intervention. Continuous AI-powered monitoring can help to detect the early signs of liver complications, which allows patients to take clinical intervention immediately before the disease gets worse (Chaturvedi et al, 2025).

- Supporting patients with early detection intervention and improving disease management, this platform will be effective for the patient to minimise emergency hospital visits and prolonged hospital admissions.
- Consequently, this implementation of digital intervention helps to reduce the burden on the NHS through improved self-management and early intervention.
- The remote monitoring features of this intervention can allow healthcare professionals to focus more on person-centered approaches and coordination of care (Thomas et al., 2021).

Therefore, controlling disease symptoms and patients' self-management through the LiverCare AI will support patients with a more preventative approach, which ultimately enhances quality of life and promotes sustainable behavior change.

However, despite the core positive expected outcomes, data privacy concerns and cybersecurity risk due to data collection can hinder the use of LiverCare AI by undermining the patient's trust.

Additionally, AI prediction may generate inaccurate and biased results, which can lead to delayed treatment and inappropriate clinical decisions (Evans and Sneed, 2024). Therefore, alongside the AI prediction and results, it still requires clinical decision-making and healthcare professional competency for better clinical diagnosis and treatment.

Conclusion

LiverCare AI evaluates its ability to strengthen long-term health management of people with liver cirrhosis through personalised support and care by integrating artificial intelligence. To reduce the impact of liver cirrhosis, LiverCare AI will maintain healthcare policies by ensuring ethical and responsible AI implementation through establishing responsible governance by complying with GDPR and data cybersecurity and data privacy policies. It will drive a positive impact on healthcare policy by promoting accessibility for all patients, which is key to reducing health inequalities and promoting health.

In the context of education, the proposed digital technology intervention will enable users to upskill their knowledge about the features and AI literacy through providing them with digital health training, digital literacy programs, and AI education. It will also contribute to encouraging patients, including older patients to boost their confidence to use digital technologies in managing long-term disease. Future research is required to evaluate the long-term effectiveness of LiverCare AI in terms of detecting liver cirrhosis symptoms earlier and its acceptability across the diverse population. Hence, LiverCare AI presents its ability to manage liver cirrhosis through personalised care, which significantly contributes to health promotion.

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