

Combating Complex, Chronic, & Costly Conditions Using a Learning Health System (LHS) Approach: A Scoping Review

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Introduction

- A LHS is an aspirational model where data from day-to-day healthcare encounters are utilized to create a **feedback loop for continuous improvement**.
- A key component of a LHS is using feedback from patient encounters to inform future care as well as incorporating feed forward mechanism where data **recently collected is used at the point of care**.
- 90% of the U.S.'s annual healthcare expenditures are for people with chronic and mental health conditions. LHSs have been tested in a wide variety of 3C conditions with many lessons learned.
- We structured our review based on the Donabedian framework for evaluating the quality of health care. The model frames the quality of health care within three simple components: **structure, process, and outcome**.

Learning Health Systems



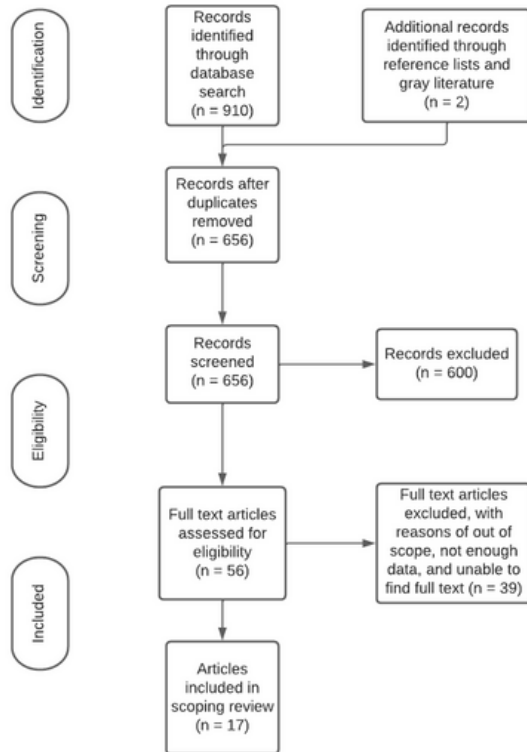
Objective

To investigate in the literature how a LHS can be implemented in cases of complex, costly, chronic conditions.

Methods

A scoping review of literature published in English since 2007 was conducted using Medline, CINAHL, SCOPUS. Two authors screened the resulting articles and two authors extracted study details on the structure, process, and outcome of each LHS. Eligibility criteria included studies of LHSs that focused on populations experiencing a chronic condition. A narrative synthesis of data was conducted using deductive qualitative methods.

Results



- We reviewed 17 LHSs that specifically addressed a chronic health condition and followed some aspect/s of the Donabedian quality of care framework. These LHSs were based in different settings such as university medical centers, VA, hospitals, and they varied in their purpose of study.
- The studies in our review focused on different chronic conditions and we categorized them based on the structural design chosen, the process utilized to deliver the required change and outcomes achieved.
- We found that all the studies reported achieving their respective desired outcomes even though they had different designs and processes in ways that they set up their LHSs, and that speaks of the flexibility of a LHS in adapting to different environments and populations.
- Some of the challenges noted in the studies we reviewed are consistent with those found in other studies in a primary care context, such as financial and time constraints, data infrastructure. CancerlinQ, the most evolved LHS in our review that was established in 2015, has encountered numerous barriers in its implementation such as improving data interoperability and utility, mitigating legal and user trust issues, and remaining competitive in the environment of emerging

Conclusion

Our findings suggest that LHSs are **feasible** in the different chronic conditions and contexts explored as part of this review. However, the challenges of initiating and sustaining a LHS are real especially in the case of chronic diseases that are multi-faceted, complex and involve many different stakeholders, and ongoing and future efforts should focus on ways to mitigate those with **evidence based proven solutions**.