Using complex systems methods to inform a wraparound inpatient model of care for adolescents and young adults

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Background:
The period of adolescence represents an opportunity to support lifelong health and well-being, through being responsive to the biopsychosocial needs of adolescents and young adults (AYA). In whole-of-life hospitals, a wraparound AYA inpatient model of care (MOC) (akin to a pediatric ward where patients are cohorted by developmental stage) could support this response. This MOC is beginning to emerge across Australia but there is limited evidence on patient outcomes. This paper describes the findings from a study that sought to determine whether a wraparound AYA inpatient MOC at the Sunshine Coast University Hospital would improve AYA patient outcomes.

Methods:
Healthcare systems are recognised as complex systems, comprising multiple interactions among organisations (e.g., hospitals), groups (e.g., medical teams), and individuals (e.g., doctor, AYA). Thus, 3 complex systems methods were used: (1) a work domain analysis (WDA) to design the wraparound AYA inpatient MOC, and (2) a causal loop diagram (CLD) and (3) a system dynamics (SD) model to evaluate this MOC. These methods involved group modelling processes with key stakeholders, including AYA health consumers.

Results:
The WDA model described the purpose of the wraparound AYA inpatient MOC, its values, the functions that need to be undertaken to achieve the purposes, and the physical objects and associated processes required to achieve the functions. The CLD created a visual representation of the factors and relationships between the factors that influence MOC performance. The SD model simulated the MOC performance over time and assessed the impacts of this MOC on patient outcomes. The models show the complexity of the wraparound AYA MOC, including the various factors (staffing, quality of care, funding) that interact to create positive patient outcomes.

Conclusions:
Applying complex systems methods provided rich insights into AYA healthcare and contributes to healthcare efforts by providing initial evidence to inform decision-making and healthcare planning.