

**Current and Future Services to Support
Young Adults with Type 1 Diabetes in Australia**

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Certificate of original authorship

I certify that the work in this thesis has not previously been submitted for a degree nor has it been submitted as part of requirements for a degree.

I also certify that the thesis has been written by me. Any help that I have received in my research work and the preparation of the thesis itself has been acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

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Abstract

Background

Many interacting factors inherent in the young adulthood development stage can limit type 1 diabetes self-management and sustained engagement with diabetes healthcare services, increasing the risk of premature morbidity and mortality in this population. One potential solution is the use of technology, providing additional opportunities to support disease management, maintain and improve communication and engagement with healthcare services. This thesis aims to explore current and future services to the support of young adults with type 1 diabetes in Australia.

Methods

Mixed research methods were used to undertake six studies. A systematic literature review of young adults with type 1 diabetes' vascular complication prevalence and factors predictive of their development was conducted, followed by an assessment of these aspects and healthcare services use in an Australian context through a case note audit. A survey of young people with type 1 diabetes and their parents explored attitudes, perceptions and experiences with diabetes management to identify any challenges, and the proportions transitioning to adult-based diabetes healthcare services potentially requiring support for continuous subcutaneous insulin infusion use. The perspectives of healthcare professionals relating to the support context for patients with type 1 diabetes using or considering this method of insulin delivery, as well as contextual influences for healthcare professionals and their patients, were then examined through semi-structured telephone interviews. Finally, diabetes educators' intentions and reported use of common diabetes-related technologies were identified through a web-based survey, and a subset of survey participants' perceived experiences,

supports and barriers to common technology use were explored through semi-structured telephone interviews.

Results

Few published studies have assessed vascular complication rates in young adults, or factors predictive of their development. However, limited evidence indicated such complications were common. Where assessed, vascular complication rates in an Australian context were like those reported globally and predicted by diabetes duration along with glycaemic control; hypertension was linked with renal function. Important indicators of services not meeting needs were found for young people and young adults, in that routine preventative service usage was low and unplanned acute service usage high. Further, young people with type 1 diabetes and their parents reported experiencing sub-optimal management outcomes. Continuous subcutaneous insulin infusion therapy did not appear to be used to its full potential, with a large proportion intending to use this technology when accessing adult-based diabetes healthcare services.

Healthcare professionals highlighted the complexity of providing support around use of continuous subcutaneous insulin infusion therapy and other common diabetes-related technologies. Intentions were higher than current use, which was unlikely to provide significant support to people with type 1 diabetes. Use of technology in the care of patients with type 1 diabetes was overwhelmingly perceived as burdensome and thus likely to inhibit engagement. Care provided was usually well-intentioned, but often fragmented and inconsistent. Technology benefits are yet to be fully realised because of difficulties with technology access, service co-ordination and insufficient range of healthcare professional expertise.

Conclusions

Thesis findings provide a multi-perspective insight into Australian healthcare services and their gaps for young adults who have type 1 diabetes. In this age group, vascular disease complications occur frequently, as do acute hospital presentations and admissions with secondary prevention services appearing often either under-utilised or inadequate for purpose. Healthcare professionals provide a source of expert care and new technologies provide innovative solutions. Policy and practice innovation is required to better support young adults with type 1 diabetes, especially outside metropolitan areas. The need for consistent and coordinated care, and increased use of common diabetes-related technologies should be a leading focus.

Definitions

Term	Meaning
Young adult	Age range 18 - 30 years
Young people	Age less than 18 years

Abbreviations

Variable	
ACR	Albumin to creatinine ratio
Apps	Smartphone and tablet applications
BMC	BioMed Central, a suite of open access publications
BMI	Body mass index
CGM	Continuous glucose monitoring systems
CI	Confidence interval
CSII	Continuous subcutaneous insulin infusion
GFR	Glomerular filtration rate
OR	Odds ratio
PDSMS	Perceived Diabetes Self-Management Scale
SD	Standard deviation
TAM	Technology Acceptance Model
YOuR-Diabetes	Youth OutReach for Diabetes, a nationally funded project