

## Physical Activity Promotion for Young People with Type 1 Diabetes

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### Abstract

#### *Aim*

The aim of this project was to provide support for children and families with Type I Diabetes (T1D) to participate in an established community-based fun run.

#### *Methods*

Eligible families were asked to complete a survey exploring their experiences and beliefs about physical activity participation. Prior to the fun run, families were provided with information about safe participation, diabetes management and nutrition. On the day of the fun run, a hypoglycaemia treatment stand was available. Additionally, medically trained chaperones were present to run with and support the young people before, during and after the run.

#### *Results*

20 families with children with T1D participated in the event. The median age was 9 years (range 6-18 years). In response to the pre-participation survey, 14 (70%) of participants reported fear of hypoglycemia as a barrier to participation in large scale activity events. 11 (55%) reported co-participants or organisers not being aware of hypoglycemia signs as a barrier to taking part. 15 (75%) of Parents reported lack of facilities to support diabetes management.

#### *Discussion*

This initiative allowed young people to safely engage in PA through addressing some of the known barriers to participation (e.g. fear of hypoglycemia, lack of supervision, lack of diabetes management awareness). It is hoped that the experience of participating in the run will encourage further PA participation and empower families living with T1D to participate in community-based PA events.

## Introduction

The global incidence of Type 1 Diabetes (T1D) in children is increasing; reports suggest that approximately 79,000 children develop T1D annually<sup>1,2</sup>. Whilst insulin is essential in the management of T1D<sup>2</sup>, additional non-pharmacological interventions promote positive clinical, psychological, and social outcomes for chronic disease management<sup>3</sup>. Physical activity (PA) has been identified as an important adjunct to pharmacological and dietary management for T1D<sup>2-7</sup>. Unfortunately, figures suggest that children with T1D are not meeting the recommended 60 minutes of daily PA to sustain health<sup>5</sup>. PA engagement for children with T1D requires careful management of blood glucose excursions<sup>2-7</sup> and T1D populations face significant, disease-specific barriers to PA engagement. Fear of hypoglycemia is a commonly reported barrier to PA participation. Furthermore, parents may be reluctant to allow children to participate in large scale community PA event (e.g. fun runs) due to potential lack of supervision and fear of hypoglycaemia. The purpose of our study was to examine barriers and facilitators to engagement in community-based PA and to pilot a support initiative for children with T1D at an already-established large-scale community fun run. A yearly fun run for children has been organised in Limerick as part of a bank holiday marathon festival annually. Ultimately, our support initiative set out to encourage attendance from among the population of young people with T1D attending our paediatric outpatient diabetes clinic in the children's fun run.

## Methods

Families who attend a regional hospital outpatient paediatric diabetes clinic were sent an email with information about the fun run and our support initiative for young people with T1D. Our support initiative included free entry to the event, pre-run information regarding nutrition and insulin management for PA, medically trained chaperones to run with the children, a hypoglycaemia treatment stand and a dedicated meeting point for children to meet and warm-up as team. Children with T1D, aged 5-12 years, and their families were considered eligible for inclusion. All families were invited to complete a brief questionnaire. The questionnaire completed by families provided information on the following variables; insulin therapy regimen, most recent HbA1c, age, age at diagnosis, perceptions of barriers and facilitators to PA participation and previous PA engagement. A code to allow free registration to the event was provided. Parents and young people were informed that medically trained chaperones would be present and would act as a 'buddy' to run with, anticipated to help allay concerns about hypoglycaemia. A meeting time was set to allow children and families to gather, become familiar with the hypoglycaemia treatment stand and meet other participants with T1D and the chaperones.

## Results

20 children and families with T1D responded (15 female, 5 male). The median age was 9 years (range 6-12 years). A minority (15%) reported that they did not intend to participate in the initiative. 60% of participants reported that they had participated in a large-scale community PA event before. 70% of respondents reported that they do not meet others with diabetes socially. There was no statistically significant difference between HbA1c of those who intended to participate and those who do not (7.7% and 8.1% respectively  $p=0.7$ ). 50% used insulin pump therapy and 50% used a multiple daily injection regimen.

The results reported below pertain to participants overall PA participation in community-based events. 70% of participants reported fear of hypoglycemia as a barrier to participation. 55% reported co-participants or organisers not being aware of hypoglycemia signs as a barrier to taking part. 45% reported ability to appropriately manage nutrition prior to the event, 30% reported fear of being left behind as a deterrent to participation. 75% of Parents reported lack of facilities to support diabetes management, 55% reported challenges to supervision with large numbers of attendees at the event as barriers to participation. 45% reported young person motivation and confidence were factors that would increase likelihood to participate in the event.

## Discussion

Exercise and PA is an integral factor for sustaining physical health and it may provide a mechanism for supporting psychosocial and quality of life factors for children and adolescents living with life-long chronic conditions such as T1D. Thus, it is important to consider the factors that support children and adolescents with T1D to participate in PA and the disease-specific barriers that they experience in leading a physically active life. Participation in this initiative provided an opportunity for young people with T1D to socialise in an active setting and to meet others with T1D outside of a clinical context. The initiative allowed young people to safely engage in PA through addressing some of the known barriers to participation (e.g. fear of hypoglycemia, lack of supervision, lack of diabetes management awareness).

Notably, the response rate was low ( $n=20$  out of 140). There are a number of factors that may have contributed to this. The lead in time (4 weeks) from first information to participation may have been too short, families may have had prior commitments. In future, the initiative will be discussed at a previous clinic visit and followed up with email information to promote increased engagement. It is hoped that this approach will allow individuals who are anxious about participation to ask questions and seek support or motivation on an individual basis. Additionally, most respondents were female, thus further research to explore the rationale behind low male response rate and low participation rate overall. Additionally, no post-run

event information was gathered. A post-run questionnaire will be included with future initiative to explore participant experiences.

Importantly, 17 young people participated in this event, all reported that diabetes-specific support was an important factor in their decision to take part. It is hoped that the number of participants will increase with iteration of this initiative annually. Furthermore, it is hoped that the experience of participating in the run will encourage further PA participation and empower families living with T1D to participate in community-based PA events by removing some of barriers (actual and perceived) to PA participation experienced by young people with T1D. Furthermore, it is hoped that similar initiatives may benefit other young people with chronic diseases, e.g. asthma, cystic fibrosis, arthritis.

**Declarations of Conflicts of Interest:**

None declared.

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