

Investigating Awareness of Type 1 Diabetes and Support for Students in Secondary Schools

**by
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Project Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Education

in the
Educational Leadership Program
Faculty of Education

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SIMON FRASER UNIVERSITY
Summer 2023

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Ethics Statement

The author, whose name appears on the title page of this work, has obtained, for the research described in this work, either:

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or

- b. advance approval of the animal care protocol from the University Animal Care Committee of Simon Fraser University

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Abstract

Adolescence can be a challenging time for those with health complications. I was interested to investigate supports for students living with Type 1 Diabetes (T1D) in secondary schools as teenage years are a difficult time for managing blood glucose levels; yet this is when assistance at school tends to decline. Through an anonymous online survey, questions helped determine awareness of T1D among teachers and administrators and adaptations for students both in the classroom and school wide. The implementation of provincial policy with respect to diabetes care in schools was also queried. Findings indicate a greater need for information about T1D to be shared with staff and a willingness to learn more to support students in school. Students with T1D need to be included in all areas of schooling in a safe and supported way with appropriate adaptations to show what they know and can do.

Keywords: Type 1 Diabetes; adolescent; secondary school; inclusive education

Dedication

I dedicate this work to my own T1D warrior and youngest daughter, Jemma. You are such a delight in my life and you live with such grace and tenacity – go and do big things!

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List of Acronyms

BG	Blood Glucose
CGM	Continuous Glucose Monitoring
DKA	Diabetic ketoacidosis
DM	Diabetes Management
EA	Educational Assistant
FA	First Aid attendant
NSS	Nursing Support Services
PHE	Physical and Health Education
Pro-D	Professional Development
T1D	Type 1 Diabetes Mellitus
TOC	Teacher on call

Glossary

Basal	Basal insulin covers the glucose your liver makes throughout the day (in between meals) and overnight. People with type 1 diabetes must always have basal insulin to stop DKA from happening. (My Health Alberta, para. 1)
Bolus	A bolus is a single, large dose of medicine. For a person with diabetes, a bolus is a dose of insulin taken to handle a rise in blood glucose (a type of sugar), like the one that happens during eating. A bolus is given as a shot or through an insulin pump. (Nemours Kids Health, Definition: Bolus)
Diabetic ketoacidosis (DKA)	A serious complication of diabetes caused by not having enough insulin. Symptoms include abdominal pain, nausea, vomiting, high blood sugar and ketones (which cause fruity-smelling breath). Without treatment, DKA can be life threatening. (Diabetes at School, Dictionary)
Glucagon	A hormone that raises blood sugar. An injectable form of glucagon is used to treat severe low blood sugar levels (hypoglycemia) when a person is not able to take fast-acting sugar by mouth (in the case of unconsciousness, for example). (Diabetes at School, Dictionary)
Hyperglycemia	Also called high blood sugar (glucose) , hyperglycemia is when a person's blood sugar level is higher than the target range. Sometimes this condition needs an urgent response. (Diabetes at School, Dictionary)
Hypoglycemia	Also called low blood sugar/glucose , mild or moderate hypoglycemia is an urgent situation and a potential emergency. It occurs when a person's blood sugar level drops below the target range. Hypoglycemia must be treated immediately with fast-acting sugar. Blood glucose must be monitored until the level is stable and returns to the target range. Hypoglycemia can be caused by: too much insulin, too little food, or too much physical activity without extra food. (severe): An urgent and life-threatening emergency. Someone with severe low blood sugar needs another person's help immediately. Symptoms include confusion, fainting, seizure, and difficulty speaking. (Diabetes at School, Dictionary)

Introduction

My youngest daughter was diagnosed with Type 1 Diabetes (T1D) when she was two years old. While providing care was overwhelming at times, for early elementary years she was in a home learning program allowing for lots of flexibility and individualized attention. Once she moved to a traditional elementary school, we participated in a series of meetings to establish and evaluate a care plan for safely managing her T1D during school hours. This included regular check-ins with a trained Educational Assistant (EA) prior to and post recess, lunch and gym sessions to assess blood glucose levels. In late elementary, I was approached by my daughter's school to inform me that her Category "D" Chronic Health designation was going to be rescinded and her support at school would be stopped for auditing reasons. This sent me into a flurry of research into provincial policy around designations and what a local school district does to support students living with T1D. Knowing that adolescence is hard for everyone regardless of health issues and that puberty has been making diabetes management challenging, I was surprised that there was such an abrupt ending to her support before high school.

I learned that in removing the designation, any funding allocated to a student is eliminated and the process would rely on the family to submit a Diabetes Support Plan and Medical Alert information to the school. A medical flag is then put into the MyEducationBC information storage platform used by the Ministry of Education and many school districts and students are left to advocate for their own support with each teacher. Some difficulties with this approach include: the reliance on a cumbersome method of disclosing medical information for everything from a pollen allergy to a life-threatening disease to be seen by the teacher, the strength of advocacy by the family to the school (though not all families will be versed in how to navigate the system) and the physical and emotional awareness of the student to speak up for their own needs.

I called and talked to the District Principal to appeal the decision and they suggested that my daughter's needs would be covered under "universal supports" available to all students. So, I started wondering what high school teachers even know about diabetes and how they offer support in the school or classroom. The provincial policy for supporting students with T1D at school requires school districts to make sure staff attend a presentation about diabetes, post a visual notice about managing

hypoglycemia in visible locations and have a process for identifying students to all staff, including teachers on call (TOCs) (BC Ministries of Health, Education and Children and Family Development, 2015). I wanted to examine how these standards of care were being implemented in high schools in my local school district.

What is Type 1 Diabetes?

Type 1 Diabetes mellitus, also known as insulin-dependent or juvenile diabetes, is an auto-immune disease when the pancreas stops producing insulin, a hormone required to get fuel from food into cells for energy. Without insulin to act as a key to the cells, glucose builds up in the blood stream which causes major disruption to bodily functions, damage to internal organs and essentially starves the cells making external intervention for glucose regulation extremely important (Nemours Kids Health, 2021). Diabetes management (DM) includes a complicated routine of insulin injections for basal (background) and bolus (for food), blood glucose (BG) monitoring and balancing nutrition with physical activity to maintain a healthy lifestyle. DM can often feel like bicycling on a tightrope - high levels of BG can have serious long-term effects like neuropathy, retinopathy and kidney disease but if BG is too low, immediate treatment is required before the body shuts down into a diabetic coma (Diabetes Canada, 2023). So, the goal is to have BG in a “healthy range” at all times which requires significant time and mental investment.

Children and Youth with T1D

The number of children and youth with T1D is growing (Kise et al., 2017; Lawrence et al., 2015; Mitchell et al., 2022). Parents of children with T1D are usually trained on diabetes care management but considering that many school-aged children and youth spend six hours a day or more at school, it is important that students with T1D are supported to help them stay in optimal BG range as much as possible while there. According to Lawrence et al. (2015) “[o]ne in 300 children has diabetes, so it is very likely that most schools will have at least one student with diabetes at any given time” (p. 35).

For many, adolescence is an exciting but stressful time where youth are testing the boundaries of their own independence while experiencing physical, social and

cognitive changes. For youth living with T1D, there are additional challenges such as insulin resistance during puberty, physical activity-induced hypoglycemia, chronic health burnout and potential cognitive issues. As well, there can be increased risk of developing eating disorders, extra hurdles in getting a drivers license and significant concern with the way a person with T1D reacts to drinking alcohol (Better Health Channel, 2021). The impact of T1D on adolescent well-being is complicated to discern as it can be reliant on several factors including (but not limited to): how long the youth has had T1D, how well regulated and controlled BG levels are, amount of parental support at home, involvement in strenuous physical activity, social understanding of peer group and need for school performance accommodations (Kelly & Berg, 2021; Kise et al., 2017; McCollum & O’Grady, 2020; Mitchell et al., 2022).

T1D in Secondary School

For students with T1D, both low and high BG levels can affect academic performance and learning. *Hypoglycemia* (low BG) can acutely and *immediately* impact the ability to concentrate and think clearly. Even once treated, it can take close to an hour for cognitive function to come back to normal. *Hyperglycemia* (high BG) “is associated with slowing of cognitive performance on tests, with increased errors and slower responses on basic mathematical and verbal tasks” (Lawrence et al., 2015, p. 36). If BG is outside of “target range” during assessment time, accommodations may be required to best represent what the student knows or can do. This may be more complicated in a high school setting with time constraints on schedule blocks and more frequent tests and exams. As T1D can be a ‘hidden disability’, it requires teachers to be aware that adolescents may not always choose or be able to advocate for their needs. At high school, where students have multiple teachers and classes in a day, this can be an extra burden on youth living with T1D.

Students with T1D may need more than just learning accommodations as outlined above. They may want a discreet location in the school to be able to administer insulin or a specific person assigned that they could go to for help with medical needs that may arise throughout the day (for example, insulin pump malfunction or sensor interruption). They may require allowance for absences due to medical appointments or side effects from BG level dysregulation. They may need accommodations in PHE class depending on required activities and BG levels at the time, as well as someone who

would know what to do if there was an incidence of acute hypoglycemia (low BG). As Lawrence et al. (2015) state: “Legally, schools must reasonably accommodate the special needs of children, including students with diabetes” (p.36).

Literature Review – T1D and Adolescence

There are many studies on the impact of T1D on adolescent life from medical implications to how BG affects learning but, recently, more research is being done on the *psycho-social* ramifications for youth. Within the literature, there are some themes that emerge: adolescence as a particularly critical time for DM with consequences for short- and long-term health, potential problems faced by adolescents with T1D at school, lack of Nursing Support Services (NSS) and care plans in secondary school and protection for rights of safety, support and inclusion in school.

Adolescence - critical time with health consequences

Before continuous glucose monitoring (CGM) technology, people with T1D needed to test their BG often, trying to keep in a target range with complicated doses of long- and short-acting insulin. As technology and iterations of monitoring devices have progressed, BG can now be seen over the whole day and “time in range” is becoming increasingly informative. Maintaining BG control is critical for both short- and long-term health. Short-term consequences of being significantly out of range are hypoglycemia (low BG) or diabetic ketoacidosis (DKA) while long-term ramifications can be complications with vision (retinopathy), nerve damage (neuropathy) and kidney function (nephropathy) (Mitchell et al, 2022).

Adolescence is a challenging time to maintain good BG control due to physical, emotional and social changes. Physically, adolescents with T1D will experience insulin resistance during puberty requiring significant increase to insulin dose routines (Kise et al, 2017; McCollum & O’Grady, 2020). Emotionally, there is often a strong desire for some independence and autonomy with DM, but the results of making poor choices can be dire. In the transition of transferring DM from parents to adolescents, it is important to establish good habits and health behaviours for the long-term (Evans-Atkinson et al, 2021). Along with greater responsibility for DM, adolescents have other psychosocial challenges – “fitting in with friends” (Kelly & Berg, 2021), “social awkwardness” (Chao et

al, 2015) and the stress of maintaining BG control during a time of “erratic eating habits, sleep patterns and activity levels [and] the emergence of increased risk-taking behaviours” (McCollum & O’Grady, 2020). Many adolescents struggle with accountability for their choices while their brains are in a stage of active development but those living with T1D have additional pressure of long-term health consequences.

Potential problems faced in school

Having T1D can affect learning in school as less than optimal BG control can result in cognitive problems, affecting concentration and performance (Mitchell et al, 2022). This can directly impact adolescents if there is difficulty with DM as “individuals whose glucose levels are frequently outside of the target range are at greatest risk for performing below their true academic potential” (Knight & Perfect, 2019). Beyond general DM, there may be some need for adaptive academic accommodations depending on BG in the moment of assessment. According to a study of glycemic control and academic performance “more time spent hypoglycemic (<70 mg/dL) within the 12 hr prior to the evaluation increased the risk for impaired performance on academic tasks. These findings support the need to move beyond considering only overall glycemic control to review temporal influences of glucose levels on academic performance” (Knight & Perfect, 2019). On-going but responsive academic accommodations for assessment may be needed as hypoglycemia can affect performance for a length of time even after treatment (Lawrence et al, 2015).

In addition to potential learning challenges, there are other impacts on teens with T1D in school like anxiety, depression or chronic health burnout and high levels of stress with friendships that may require school staff understanding (Evans-Atkinson et al, 2021). For some adolescents, having their diabetes be visible or revealed to others causes difficulty (Kelly & Berg, 2021; Chao et al, 2015), sometimes resulting in choices that do not promote self-care. “The overriding importance of belonging to a peer group and aligning with social norms can result in reduced glucose testing and insulin omission, particularly during school hours” (McCollum & O’Grady, 2020, p779). Even regular school routines can cause hardship if there are any rules or regulations that deny students with T1D access to their DM devices (including phones), snacks or supplies at all times – for example, if backpacks must be left in lockers. Whether made highly visible or kept private, DM is a burden on adolescents with T1D at school (Hayes et al, 2017).

Yet, this critical period is when at-school support tends to wane for students living with T1D. Kise et al. (2017) suggests:

[A]dolescents are at risk for having problems with DM. Some students are less confident managing diabetes by themselves at school and some students do not perform DM tasks to avoid unwanted attention and feeling “different.” Several concerns may lead to this perception, one of which is a lack of support during transition from parent-dependent relationship to the relative independence of adolescence. (p. 364)

Due to spending a considerable percentage of waking hours in school, it is necessary for DM to be supported there (Lawrence et al, 2015).

Adolescence can be a time of anxiety with school and social life and those with T1D have additional stressors such as: pressure to always keep BG in control, pain on insertion of CGM or insulin pump technology, remembering to complete all the DM tasks or feeling that they are missing out on school activities, sports or events due to DM or endocrinology appointments (Chao et al, 2015). Additionally, advocacy for self against assumptions, stereotypes or stigma can be exhausting (Hayes et al, 2017).

Nursing services and care plans – lack of support in high school

In British Columbia, NSS often completes care plans and training for EAs to support students with T1D in elementary school. As students move up the grades, the support lessens as students take on more of the DM. “The ultimate goal of NSS-delegated care is to support students to work toward independence in self-management, to the extent that is appropriate for their functional and cognitive ability, maturity and experience” (Evans-Atkinson et al, 2021, p16) This system seems to be positively perceived by families for elementary school; however, in high school, there is limited NSS support in place.

Lawrence et al (2015) suggests that an individual care plan should be developed for *each* student with T1D and clearly define the division of responsibility among school staff, parents and the student. As a large percentage of high school students do not have a care plan, many identify the lack of training of school staff in case of a T1D incident, lack of private location for DM and restrictions on activity as difficulties and “it is

clear that greater school-based support is required for adolescents with type 1 diabetes” (McCollum & O’Grady, 2020, p783).

Student rights at school - safety, support, inclusion

As advocated by the Canadian Paediatric Society, all students, including those with T1D, have the right to be safe, supported and included at school, which requires school administrators, teachers, parents and students to work towards the same goal. With respect to the right of safety, there is concern that school staff are not trained for hypoglycemic incidents (low BG) as it is *imperative* that a student not be left unattended in that state (Kise et al, 2017; Lawrence et al, 2015). While unrealistic to expect teachers to become experts in all health conditions, it is necessary for school staff to be aware about the possibility of acute T1D incidents and to recognize signs of student emergency. Different levels of training are available for school personnel depending on how involved a staff member will be with the T1D student (Scarr & O’Donnell, 2013); however, “[n]early half of interviewed adolescents, parents and school personnel believed that school personnel were inadequately trained” (Kise et al, 2017) which can create a barrier to have T1D adolescents participate fully and safely in all high school activities.

Other ways to support a student living with T1D can include a private area for self-care and academic accommodations when needed (Lawrence et al, 2015). Nutritional information for food at the school cafeteria is helpful for students with T1D to make insulin dose calculations (Kise et al, 2017). Support may even be as simple as allowing students with T1D to always have access to diabetic supplies, snacks and devices (which may be linked to their phone) and not to have to go to a locker to retrieve them (Kise et al., 2017). As adolescents move into greater independence and responsibility for DM, support for their autonomy results in better health and well-being outcomes (Kelly & Berg, 2021).

Inclusion in all activities is the goal for full school experience and it is possible, with notice and accommodations (Stirk et al., 2021). “Students with diabetes should participate fully in physical education classes and team or individual sports” (Scarr & O’Donnell, 2013, p.8) and may require extra attention to BG and individual response to physical activity. Policies around attendance need to be accommodating for medical

appointments and time for related DM (Lawrence et al, 2015). Notably, when inclusion-focused support was in place, even if rarely used, the level of personal resilience in adolescents was higher and stress was lowered (Hayes et al, 2017).

Points of Conflict

There are “mixed” findings on the impact of T1D on academic performance with studies in Sweden and the US showing a negative effect and other studies in Australia and Scotland showing no difference. A prior study found that length of time living with T1D may be an influencing factor (Mitchell et al, 2022). Progress in diabetes research and CGM technology may render previous studies less relevant as BG monitoring and focus on “time in range” become more important.

Gaps in Research

There is a limited amount of information on high school specific support for students with T1D. A recent study into the perception of safety with care plans in BC had only 1.3% of respondents for Grade 8 or above (Evans-Atkinson et al, 2021, Table 1). “Literature assessing secondary school teacher knowledge of diabetes is limited and, in some of the studies that do exist, data for secondary teachers are not reported separately from their primary school counterparts” (McCollum & O’Grady, 2020, p780). Given the academic, physical and social challenges faced by adolescents living with T1D and the de-designation of students as they transition to high school, finding out what teachers and administrators know and do to support T1D is an important area that I wanted to research.

Methodology

I sought to assess the level of general knowledge about T1D in secondary school teachers and administrators and determine the extent of access to adaptive supports in both the classroom and schoolwide. I also was interested to find out if the care measures that were identified by the provincial policy were implemented in schools. To answer these questions, I created an anonymous online survey with both quantitative and open-ended questions. An email invitation to complete the online survey was a cost-

effective, minimally intrusive method allowing administrators and teachers to participate at their own convenience. The quantitative questions allowed for numerical analysis while the two open-ended questions added depth to the results.

The Research Questions

In order to examine this topic, I created the survey to examine the following overarching and sub questions:

Q1: What knowledge do teachers and administrators have about T1D in secondary schools?

Sub Q1a: Is there willingness to learn more about T1D as professional development (Pro-D)?

Q2: What supports for students with T1D are available in the classroom and in the school as a whole?

Sub Q2a: What is the perception of timely access to first aid and support for a hypo- or hyperglycemic emergency within the school?

Q3: How familiar are Principals and Vice Principals with provincial and district policies around identifying and supporting students with T1D?

Sub Q3a: How are the policies implemented within schools?

I designed the survey questions to directly query what was laid out in the provincial standards of care or identified in the literature. Survey questions are listed in the appendix. Respondents were asked to describe their own level of knowledge about T1D and then identify as many symptoms of hypo- and hyperglycemia as possible along with their level of confidence in the recognition of specific signs of BG dysregulation. Respondents were asked about the level of support for impactful help to students, including access to devices, snacks and washrooms as well as rescheduling of assessments in case of T1D related events. Participants were asked if they were a designated first aid attendant (FA) in the school or if they ever needed access to first aid on behalf of a student and their confidence in a timely response. Teachers were asked to identify their primary teaching subject in order to filter out PE teachers to query process of identification of a student with T1D and access to supplies in case of a hypoglycemic incident.

With respect to provincial policy implementations, provincial standards include that staff have seen a general presentation about diabetes, that information regarding the management of low blood sugar is put up in places around each school, that two staff members be trained in emergency delivery of glucagon and that each school have a specific way that all staff (including temporary coverage for the day) would be notified about students with T1D in the school (BC Ministries, 2015). The survey included questions for teachers and administrators on these points. Another one of the provincial standards requires each district to “ensure that schools are familiar with the Provincial Standards of Diabetes Care in the School Setting document and district policies and procedures related to supports for students with T1D, and that these policies are communicated to the public” (BC Ministries, 2015, p.8). The survey included a question to ask administrators to identify their level of familiarity with this document. Logic branches were developed to allow individual answers to flow to relevant questions.

Researcher Role/Positionality

As my own daughter moves from elementary school to high school and is de-designated from the Category “D” chronic health, I have some concerns for her safety and health (both physical and emotional). My hope is that this research will help her, and others living with T1D, be set up for success in the transition to high school. I have a fair understanding of the medical side with an interest in the social consequences for adolescent students with T1D. As a teacher, parent and T1D care provider, I have a deep understanding that “[d]iabetes and its complications have major personal, social and economic impact, and improved diabetes control reduces the risk of both short- and long-term complications” (Lawrence et al., 2015, p. 35). While the de-designation was jarring, I am trying to be conscious of my own bias and not influence the data collection or interpretation of the results by keeping a reflective journal.

Research Site/Participants

The research was conducted through an anonymous online survey and the link offered by email to administrators and teachers at secondary schools within a large school district in the Lower Mainland. Included in the sampling frame were those in a current role of principal, vice principal, teacher (including French Immersion), teacher librarian or

listed TOCs in each school as appropriate. Excluded from the sampling frame were the following:

- Building Academic, Social and Employment Skills (B.A.S.E.S) / Learner Support Team teachers – These teachers have a different role and focus, offering alternative programs in the school which may not be integrated with the general student population.
- Education Assistant (EA) – Each EA is usually assigned to a particular student for a specific need and may not be available to the general student population.
- School staff (for example, office or custodial) – These staff members may interact with the whole student population, but not in the classroom or necessarily during school hours.
- Counsellors / Child-Youth Care Worker – These are more specific roles with a different job focus that may not interact with the general student population.
- Adult Education programs – The typical student would fall outside of the age parameters of 'adolescent'.
- Learning Centres or alternative programs for home learning – Due to different nature of these programs, there may be increased parent intervention or specific accommodations already in place.

My original intention was to access teachers and administrators directly from publicly available school email address lists. However, the local district required permission to be given by principals before contacting teachers. I approached two principals of the schools with which I have personal experience and who know me as a member of the community to explain the project orally with a follow-up email detailing information. For all other secondary schools in the district, I sent separate emails to each principal with the school name in the subject line to allow emails to be individualized and so that I was able to more easily track responses. I explained the project, attached my district letter of approval and requested permission to contact their teaching and admin staff. From the initial offering, seven principals gave permission to contact staff directly, two principals responded that they would send out the link to their own staff, one principal responded that they were not interested as it was not a good time and 11 principals gave no response. I offered those principals a second opportunity with one principal responding that they would send the information to their own staff and two principals allowed me to contact staff directly. In total, I was able to send the survey link to 746 individuals. I received 170 responses, of which 150 met inclusion requirements,

for a 20% response rate. Individual email addresses were blind carbon copied in every email and contact lists were deleted once completed.

The extra hurdle of obtaining principal permission to contact staff proved to be both a help and limitation to the research. On one hand, the principal sanction gave additional legitimacy to my survey invitation email as each were provided with the research approval letter from the district. One respondent emailed to say: "I checked with my principal and he has given me the go ahead to do your survey... I wanted to be sure your link was not spam as we have been getting a lot of those lately" (personal communication, February 1, 2023). However, needing to get permission from principals also restricted access to a large number of potential respondents at nine secondary schools as the principal did not respond to either invitation email due to time or other constraints.

Data Collection

I used Survey Monkey to create an anonymous online survey and sent the link via email. In total, participants were sent three emails: 1) to inform about the study and invite participation, 2) to remind of the study at the mid-month mark and 3) to alert the last 48 hours before the close of the survey. The timing of the survey was considered to avoid high intensity times (for example, year-start or year-end, exam weeks or semester starts) and the survey was held open for one month. No financial incentives were offered, but I added links for learning resources at the end of the survey.

Two places to give consent were provided prior to completion of the survey. The invitation email contained information about the research project as required by ethical standards. If the participant proceeded to click on the link, there was a landing page that also shared information about the study needing a click to consent to continue the survey. The survey was voluntary and participants could exit at any time. Individual identifiers were not captured and participants were anonymous. Raw data has been stored with SurveyMonkey and analyzed on a password-protected computer.

Data Analysis

Data was analyzed in Survey Monkey as tables and charts and exported to Excel as numerical values (0-4) to find mean, median, mode and standard deviation for some quantitative questions. I looked for patterns and comparisons. I did a T-test to compare the average level of knowledge as described by teachers and administrators respectively, but a p-value of 0.47 shows the difference is not significant. I also looked for any correlations between the perceived support for adaptations in the school versus in the classroom.

In the open-ended answers, I used inductive analysis by reading through the participant text and colour coding similar responses to develop themes. I kept a running memo to highlight themes and find responses that either concisely represented the ideas of many and those that were interesting to include in their own words.

Validity and Reliability

To protect reliability, instructions were standardized for every participant. Survey questions were designed to reflect internal consistency. For example, similar questions to compare schoolwide and classroom specific adaptive supports used the same wording and phrases so that the participant was able to keep their understanding consistent. I developed each question with the literature or the provincial standards in mind and used hypo- and hyperglycemia symptoms listed in the Diabetes at School information to allow for consistency with any potential training a teacher had.

For increased validity, I kept a reflective journal throughout the process to record steps taken and emails received. To test face validity, I pilot-tested the online survey with some close friends and teaching colleagues, some of whom had T1D themselves. I asked for feedback with respect to the following: visual presentation, functionality of the survey, clarity of the questions, length of time to complete, relevance to the topic and sensitivity of questions. Key feedback resulted in the addition of an early filtering question (to maintain the integrity of the sample), re-formatting or adding clarification to some questions and the addition of some open-ended questions. As well, I added more learning resources at the end of the survey to help teachers further their own knowledge, if they so choose.

To give space for any participant remarks or thoughts, I constructed two questions at the end of the survey that were open text boxes. The first asked for comments about any resources that would help to support students with T1D and the second asked for anything else to share. Numerous themes emerged that I colour coded and grouped to present representative quotes capturing the theme. I also kept a running memo while developing themes to highlight thoughts throughout the process.

There were some unanticipated limitations to the study. Despite attention given to the timing of the survey, there was some concern that it came during an active campaign to discourage teachers to be caught by unsafe links. One respondent emailed:

You chose a really poor time to do your research...The District just put out a PHISHING educational video and [t]hen a Test all staff in the district had to take...then a test communication to catch as many staff as possible....So, there is a good chance many will ignore it (personal communication, February 23, 2023).

In a future study, the consideration of such a campaign might need to be considered.

An early survey question was designed to filter out any non-teaching roles (for example, office support) and those not in secondary schools. One of the principals that was sending out the information to their own staff put *all* staff in the distribution, including EAs. I received emails from some who tried to do the survey but couldn't get past the first question:

I have been an educational assistant ... for 19 years and have acted as our Level 2 First Aid Assistant here for 10 years. I was starting to participate in your survey, but unfortunately, I couldn't get past question #1 as EAs are not listed as option to choose therefore it would not let me continue. Sorry I couldn't be of assistance. Good luck with your survey. I'm very interested in the results as I believe very few people know much at all! (personal communication, February 2, 2023)

Therefore, there is some discrepancy in the number of respondents who gave consent to do the survey and those who could complete the survey. It would be interesting to include responses from EAs in a research sample for any future research.

On the technical end, it appeared there was one glitch in the recording of responses to the question about being a designated first aid attendant (FA) in the school. Only one response indicated that they were the school designated FA, but in each of the FA questions, there were two responses. I went through individual

responses to see how that happened: respondent #59 answered yes to being FA and then continued to answer the following FA questions. Respondent #5 skipped the question about being the FA, but then indicated a negative answer for the two following questions (Q23, Q24 respectively). The logic branch did not take a skipped question into account so, as I did not know if the respondent was a designated FA, I excluded the response from the data.

Findings

Overall, 94% of the survey respondents were teachers or teacher librarians and 6% of the responses identified as administrators. The majority of teachers and administrators surveyed had worked with a student who had T1D (67.16% and 88.89% respectively). The following shows the findings for each of the research questions.

Level of knowledge about T1D

Teachers and administrators were asked to describe their current level of knowledge about T1D. 69.77% of teachers described they had from general knowledge to a lot of knowledge while 30.24% described little to no knowledge about T1D. 77.78% of administrators described they had general knowledge with 22.22% describing little knowledge. When looking at numerical values, the averages of both groups are very similar (2.79 for teachers and 2.78 for administrators respectively).

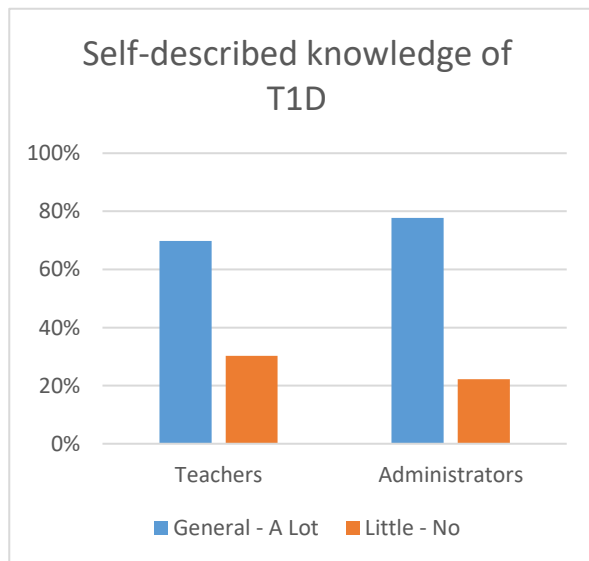


Figure 1. Described knowledge of T1D

Knowledge of symptoms for Hypo- and Hyperglycemia

Survey participants were asked to identify the symptoms for hypo- and hyperglycemia. 10 possible symptoms were listed as found on the Low and High Blood Sugar posters from Canadian Paediatric Society designed website *Diabetes at School* and respondents were asked to check all that applied (to the best of their knowledge). I was interested to

see which symptoms were the most commonly known and which ones might need more awareness.

Hypoglycemia (Low BG)

The top three symptoms known to respondents were weakness/fatigue (87.02%), dizziness (85.5%) and shakiness (80.15%) while the least well-known symptoms were headache (53.44%), hunger (54.96%) and sweating (56.49%). Of concern, hunger is a very common symptom of hypoglycemia and often students with T1D need access to fast acting sugar to prevent a more severe low BG. Also significant is that sweating is not as well-known but is a very common (almost always) and visible symptom of low BG (HealthLinkBC, para. 2). 62.6% of respondents reported that they were not at all confident to little confident in their ability to identify symptoms if student in class has hypoglycemia with 37.41% feel somewhat to very confident (see Figure 2). Notably, hypoglycemia is a state that can often become urgent and needs immediate action, potentially resulting in severe health outcomes and even affecting student learning for a period of time after treatment.

Hyperglycemia

The top two symptoms known to respondents were extreme thirst (75.19%) and frequent urination (65.89%) while the least known symptoms were hunger (18.6%), vomiting (23.26%) and abdominal pain (28.68%). Of significance, vomiting and intense abdominal pain can indicate more serious high BG which needs emergency rapid response (with possible DKA if left unattended). 75.2% of respondents reported that they are not at all confident to little confident in their ability to identify symptoms if student in class has hyperglycemia with 24.81% feel somewhat to very confident.

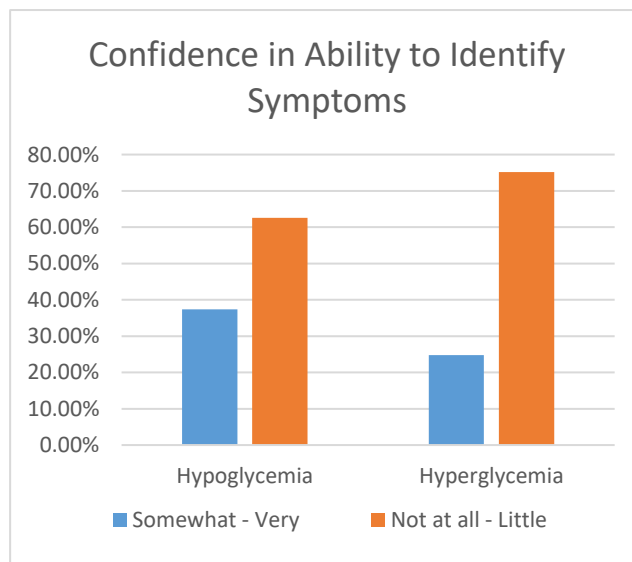


Figure 2. Teacher confidence in ability to identify symptoms

Willingness to learn more about T1D as Pro-D

Only one respondent identified as having done training on the *Diabetes at School* website developed by the Canadian Paediatric Society. However, 84.4% teachers responded that they likely would or definitely would be willing to do training as professional development (Pro-D). In the open text responses question, one respondent wrote:

Thank you for doing this important work, I will look at the "Diabetes at school" website but I deeply wish the employer would give us paid time to do this (and to learn about other medical needs and learning disabilities) because it's a complete gap in the system.

Supports available in the classroom and school

Students with T1D may need a variety of supports in the school and, specifically, in the classroom. I looked to compare results from teachers between the perceived level of school support and support in the classroom by converting the answers into numerical values (1-4) and finding the weighted average (taking out any 0-values for a response of 'unsure'). The average value indicating comfort with allowing supports in the classroom was consistently higher than the perceived level of support in the school as a whole. As well, the selection of 'unsure' as an answer dropped dramatically in the classroom questions as teachers have more of a direct impact on those decisions.

Table 1. Comparison of averages between in school and in class supports

	Perceived support in school (average)	Identified support in classroom (average)
Unrestricted student access to a personal medical device (such as glucose monitor or insulin delivery system)?	3.82	3.98
Unrestricted student access to a personal phone for a medical reason?	3.81	3.94
Unlimited access to snacks or food for a medical reason?	3.77	3.98
Unlimited access to washrooms during class?	3.56	3.81
Re-scheduling of assessment if medically impacted (experiencing hypo/hyperglycemia) or excused from class for a medical reason?	3.79	3.93

Of note, unlimited access to the washrooms during class had the lowest average in both school wide and classroom support. Sometimes, there are school wide issues (for

example, washroom restrictions) that can have greater adverse impacts for students with T1D.

Access to first aid and support for an emergency

99.19% of teachers responded that they were not the designated FA at school, yet 67.5% of respondents had needed to access a school FA on behalf of a student. However, 83.47% of respondents felt somewhat confident or very confident in timely access to FA. When administrators were asked how confident they felt that at least two school personnel were trained in the emergency procedure of administering glucagon (in case of a severe hypoglycemic incident), half the respondents felt somewhat to very confident and half felt not at all to a little confident. One of the respondents wrote: “Nobody wants to be the First Aid rep because it’s a ton of extra work with no extra pay or benefits. Pay them.”

Teacher respondents were asked to identify the subject area that they taught most of the time. This allowed me to look at PE specific data which is meaningful as physical activity can have a greater impact on BG. Of the PE responses, 85.72% felt somewhat or very confident in the process of identifying students with T1D. However, only 57.14% felt somewhat or very confident in access to fast acting sugar (for example, juice box or dextrose tablets) in case of a low BG incident. More significantly, only 14.29% felt somewhat or very confident in access to and emergency glucagon kit in case of a severe hypoglycemia incident in class, leaving 85.72% feeling not at all or a little confident.

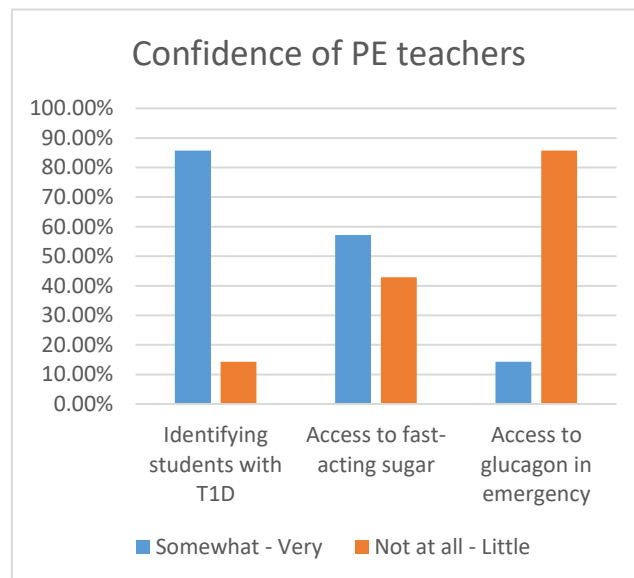


Figure 3. Confidence of PE teachers for students with T1D

Familiarity with policies around T1D

When asked to identify their level of familiarity with the Provincial Standards of Diabetes Care in the School Setting document, 62.5% of administrators responded with not at all to a little familiar and 37.5% with somewhat to very familiar.

Implementation of provincial and district policy

Most administrators (77.78%) were somewhat to very confident in the process of identifying students with T1D to all staff, including TOCs. However, 87.5% of administrators were not at all or a little confident that their staff had attended or reviewed the General Information about Diabetes for School Personnel presentation as laid out in the provincial standards document, with only 12.5% feeling somewhat confident. For teachers, 96.8% responded 'no' or 'I don't know' when asked if the school district had provided the opportunity to attend or review the presentation and only 6.4% of teachers responded that they had attended or reviewed that presentation.

When asked if they had seen the poster *Managing Low Blood Sugar* in visible locations in the school, 92.31% of teachers responded that they had not. Significantly, the answer from the administrators unanimously indicated that there were no posters in visible locations around the school.

Themes from open-ended questions

At the end of the survey, all respondents were given an open text opportunity to write about any resources that would make it easier to support students with T1D at school and then any last thoughts they wanted to share towards that end.

Resources to make it easier to support students with T1D

Themes that emerged from the comments about resources that would make it easier to support students with T1D include: a desire for clear identification of students with T1D, some informational training done through staff meetings or Pro-D, having a quick visual information sheet, access to supplies and having nursing or medical support.

Clear identification of students with T1D

A key way to make it easier to support students with T1D is to be aware of their condition. Several respondents talked about the need for knowing or explicitly being made aware of students with T1D in their care. One respondent wrote that they desired “easily accessible knowledge of which students need support” while another needed “specific information I would need about a diabetic student in my care”. A different respondent wrote that they wanted to know at the beginning of the school year or semester:

I know it is noted in MyED and my responsibility to look it up, but there are many students that have medical alerts for things like seasonal allergies with no medication required. Something serious and life threatening should be relayed to us quickly.

One respondent had their own system for identifying students, stating that “students have communicated with me via the PE dept medical info form at the beginning of the semester and I have then had conversations with those students as to letting me know their needs”.

One respondent indicated they wanted “[t]o be informed by a parent or counsellor. I understand it is a privacy issue, but I feel like avoiding a dangerous medical emergency should trump that”. Some subjects may be more impacted than others, as this respondent states: “I am a Foods teacher and this would be needed to safely feed the child at school.” Speaking to the way in which staff can be informed, one respondent suggested that it would help to be “immediately notified about any students with this condition. Perhaps in person would be best as we receive so many emails about so many students and their issues”. One respondent requested a “[t]eacher handout, one page given to teachers who have a type-1 student in their class.”

Informational training

After knowing that a student has T1D, some kind of training would make things easier. The comments from respondents listed desire for training in general, more specific training offered at a staff meeting or through workshops and Pro-D.

Respondents shared that they could receive training in a variety of ways. One respondent suggested it would help to have “[e]lectronic resources given when I have a type 1 diabetic student in my class” while another suggested a “[q]uick training video

assigned to each teacher that has a type 1 student in their class at the beginning of each semester” or a “[p]ower point with key points listed. Warning signs etc.”. Another suggested: “Some type of information video or pamphlet, although I am sure these things exist I cannot recall coming across this material”.

With respect to what information could be in the training, respondents wanted “[m]ore information about what to look for and how to deal with both hypo- and hyperglycemia”, “signs and symptoms of diabetic emergencies”, “[a]dditional education on specifically what is in place at site locations for students” and “[o]nline training for all their teachers especially regarding new equipment they are using, signs of lows and highs, and regular check ins with all team members to review any issues”.

Several respondents suggested that informational training could be delivered through “[q]uick lessons during staff meetings (that way no teacher misses it)”. One proposed “[i]n-service training from the School district at a staff meeting or during the day” while others suggested training could be a “workshop during a Pro-D at school”. One respondent wrote that a “Pro D day on general physical and mental health would be excellent - which could include Type 1 diabetes” while another submitted that training be “required first aid pro-d, potentially leading to certification”. Another advised to have “[t]ime set aside during the workday/Pro-D day”.

Quick visual information sheet

Several respondents identified the desire for a quick, visual way to check and refresh knowledge of T1D. One respondent asked for “[p]osters: to the point, clear info with basic signs to watch for and what to do” while another requested a “[q]uick access guide to symptoms and next steps.” There were a number of responses echoing a call for “[i]nformation posters about symptoms of high/low sugar”. One respondent recommended “[m]ore posters around school to help making the disease more well known” while another suggested “an info brochure/booklet available in every classroom”. Along with “quick infographics” there could be “[p]osters with QR code”. One participant who shared that they had a number of students in the past said: “I would create a cheat sheet in my office and made sure that I had the parent's contact information and the child's medical number on hand”.

Access to supplies

Some respondents shared that it would make it easier to support students with T1D if there was “access to all and any medical supplies and candy/pop on an as needed basis – not just at the office”. Several respondents suggested “access to snack in several location as high schools are large” and things should be “in a centrally located area”.

Nursing or medical support

With respect to the question about resources that would make it easier to support students living with T1D at school, one respondent wrote that there should be “[c]lear communication from parents, clear training for our FA reps (as part of their FA training) and clear instructions available for teachers with students with T1 Diabetes”. Another suggested that there be “[n]ursing or non-teaching staff in the school to support the health needs of students”. Along with “access to timely medical attention” there should be “[m]ore prominent attention to this when we have a student with Type 1 Diabetes. A team meeting to support the student's needs and address concerns - nurse training”.

Last thoughts to share towards supporting students with T1D

All respondents were given a chance to share anything else towards supporting students with T1D at school. Some themes that emerged were around de-stigmatizing T1D and increasing awareness, encouraging student and parent advocacy, developing communication and student supports, and making training efficient.

De-stigmatizing T1D and increasing awareness

Several respondents shared that schools should work towards de-stigmatizing T1D and increase awareness amongst staff and students. One respondent wrote that “presenting diabetes as a life long condition rather than a disease might be helpful as diabetics are probably more in tune with their bodies than other people”. Another suggested that “[o]nce we are all aware of the signs....we can help students maybe identify that something could be wrong and they should get checked before it gets worse”. Further, we need to be aware that “[s]tudents are not the only Type One's in schools”. Even students of different ages may need more support as shown by this respondent:

I found it interesting when I teach young grade 8 (13 years) students. I never realized the impact of hormones on regulating sugar levels at this age. Think teachers should be informed on how to support them more. Think our school needs to promote more awareness and with regards to sugar level conditions should know how to identify irregular sugar levels and know how to provide care for them.

Sometimes, what teachers know in their own life experience can help their students as per this comment: “My niece is diabetic 1 so I am a little more knowledgeable than most” and another respondent pointed out that “[y]ou have to know them before you can tell the difference between their normal and a high or low”. Even just completing the survey seemed to raise awareness with some respondents: “I need to inquire if any of my students live with Type 1 Diabetes!”

Encouraging student and parent advocacy

Some respondents wrote about encouraging students to advocate for themselves as “I will support students with Type 1 Diabetes as best I can and support them to advocate themselves”. In addition, “[s]tudents are welcome to share any needs/info about themselves with counsellors or admin” and to support others by “[t]eaching the students in class that how they can support their friends who are diabetic”. Another respondent wrote:

A general email from the parents is helpful. This is what usually occurs when you have a student with type 1 diabetes in your class. The parent and the teacher connect to ensure that the student's needs can be accommodated.

Another wrote that it is a “[g]ood idea for parents to also advocate for their children”.

Developing communication and student supports

Teachers have many ways that they communicate feedback to students and families. It is important for teachers to work on:

developing an open communication between school team, teacher and parent on medical conditions students have. [T]his provides clarity to teachers to know how, when and what is needed to support the child's medical needs in the classroom.

Another mentioned that:

Some semesters I have up to and beyond 120 students in my care. It is not always possible to reach out to each family in person but it is worth

having students complete a welcome questionnaire (especially if it is their first year at your school) and following up with the more high risk students.

Some respondents shared that: “Teachers need to understand how serious this is and to allow as many accom[m]odations as their students need”. Supports in class can look like “[j]ust to be sensitive, allow students to use the bathroom, eat and drink when they need it without having to ask permission”. However, student supports may extend beyond the classroom as one writes: “Some of my type 1 kiddos need more access to counseling around support for anxiety related to unstable blood sugar levels”. Another suggests that it would be good to “provide a “support group” exclusive to T1D students to provide a safe space where they can come to when feeling hypo or hyper glycemc and know they are being monitored teaching all staff about T1D and the symptoms to look out for”. It is important for a whole school team, including admin, counsellors, teachers, students and families to work together to support each student living with T1D.

Efficient training

For many teachers, time is a luxury. This is expressed by several respondents in the need for training to be efficient. “Any training that is lengthy or involves lots of reading is difficult to reference or remember. If there is something succinct, that would be most effective”. For the safety of students, this writer suggests: “[h]aving been through the Glucagon training I understand it better than some, but it should be standard for all school personnel charged with student health and safety”. Another requests “[m]ore training on glucagon administration. I was first aid and we had a nurse come in a few times, but that stopped after covid”. For some, knowing the big picture across the province would be helpful: “More information about how many students in the province have Type 1 Diabetes. Actions Plans on how to deal with the challenges”.

Discussion

With the gap in literature regarding secondary school teacher knowledge, this research shows information for some schools in one local school district. Many respondents indicated having a general knowledge about T1D but a majority were not very confident in the ability to identify signs of hypo- or hyperglycemia in class. Given the potential for emergency situations, more knowledge of the signs and symptoms would be important. Respondents showed a strong willingness to learn more as professional development to

support students in their care. There was a solid indication of comfort with access to supports in the classroom for students with T1D, especially in the classroom. There was confidence in the perception of timely access to first aid in those that had indicated that they had accessed first aid for a student in the past. However, of those respondents that identified as teaching PE most of the time, there was a concerning lack of confidence in access to emergency glucagon in case of a severe hypoglycemic incident.

With respect to familiarity and implementation of provincial and district policies, there is not a strong indication that it is happening “on the ground”. A very low percentage of respondents have attended the general presentation for school staff about diabetes and a miniscule percentage have seen the poster about managing low BG. These are two areas where the district could allocate time and resources to strengthen implementation of provincial policy and increase the knowledge teachers and administrators have regarding T1D. Teachers are the front line with students and need to be more informed in order to support any students with T1D. As well, the majority of administrators were not familiar with provincial standards. Having focused attention on awareness of administrators may help trickle down to teachers in secondary schools.

Future research could include additional voices by surveying more high schools across different districts or including EAs in the research sampling frame. If a school or district was identified as performing well in this area, it could be interesting to see what methods contributed to that success. As well, it would be fascinating to find out student and/or family perception of safety at high school. There could also be an investigation into what families know and perceive about the de-designation process and whether that impacts outcomes of support in high school.

Conclusion

Current knowledge of T1D in secondary schools is dangerously inadequate. Information is needed to be shared about this disease that affects student health and learning as well as protective measures that teachers and schools should be prepared to enact for students in their care. School districts should fully implement policies and procedures to align with the Provincial Standards of Diabetes Care in the School Setting document, especially for students with T1D in high school without a designation or NSS support. A proactive approach to communicating with student families about the de-designation

process and next steps would alleviate stress and ensure that each student is set up for a successful transition to high school. Ultimately, we want students with T1D to be safe and included, and best able to represent who they are and what they know, understand and can do.

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Appendix. Survey Questions

Informed Consent

This is an invitation to participate in a research study to determine general knowledge about Type 1 Diabetes and student access to assistance in high schools across XXX School District.

This research is being conducted by BC teacher, Alison Hamilton and supervised by Dr. Dan Laitsch, Associate Professor in the Faculty of Education at SFU. You are being invited to complete a short online survey (approximately 5 minutes) as a teacher, principal or vice-principal in the XXX School District. The survey will stay open for one month.

Your participation is voluntary and you may exit the survey at any point before submission. Individual identifiers (like name or school) will not be captured and your answers are anonymous. It will not be possible to withdraw after you submit the survey as results are unidentified.

There are no anticipated risks or benefits to you by participating in this research. Raw data will be stored with SurveyMonkey and analyzed on a password-protect computer. Alison will use data from this survey to produce a final report and public presentation for the M.Ed program in the summer 2023. In addition, findings will be shared with the Research and Evaluation Department to help build a broader understanding of ways to support students living with Type 1 Diabetes in secondary schools.

Regardless of your participation, if you would like to discuss this project, you can reach Alison and Dr. Dan Laitsch. If you have any concerns about your rights as a research participant and/or your experiences while participating in this study, please contact the Director, SFU Office of Research Ethics.

By clicking “Yes” below, you indicate that you consent to participate in this study. You do not waive any of your legal rights by participating in this survey. Thank you for your time and insights!

*** 1. I have read and understood this consent and I agree to participate in the study.**

Current Role in Secondary School

*** 2. Which of the following best describes your current role in a secondary school?** (logic branch to take administrators to Q40)

Personal Experience with Type 1 Diabetes

3. How would you describe your current level of knowledge about Type 1 Diabetes?

4. Have you ever worked with a student who had Type 1 Diabetes?

Hypoglycemia (Low Blood Sugar)

5. To the best of your knowledge, which of the following can be symptoms of hypoglycemia (low blood sugar)? (Check all that apply)

Shakiness

Hunger

Irritability

Weakness / Fatigue

Dizziness

Pale Skin

Sweating

Confusion

Blurry Vision

None of these

Headache

Unsure

6. Have you seen a poster about *Managing Low Blood Sugar* visible in your school?

7. If a student in your class or school has hypoglycemia (low blood sugar), how confident do you feel in your ability to identify their symptoms?

Hyperglycemia (High Blood Sugar)

8. To the best of your knowledge, which of the following can be symptoms of hyperglycemia (high blood sugar)? (Check all that apply)

Extreme thirst	Hunger
Irritability	Warm, flushed skin
Frequent urination	Abdominal pain
Rapid, shallow breathing	Vomiting
Blurry vision	None of these
Headache	Unsure

9. If a student in your class or school has hyperglycemia (high blood sugar), how confident do you feel in your ability to identify their symptoms?

School Support

Once medical need is confirmed, how much does your school support the following:

10. Unrestricted student access to a personal medical device (such as glucose monitor or insulin delivery system)?

11. Unrestricted student access to a personal phone for a medical reason?

12. Unlimited access to snacks or food for a medical reason?

13. Unlimited access to washrooms during class?

14. Re-scheduling of assessment if medically impacted (experiencing hypo/hyperglycemia) or excused from class for a medical reason?

Impact in the Classroom

Once notified that a student has Type 1 Diabetes, how comfortable are you to allow the following in your classroom:

15. Unrestricted student access to a personal medical device (such as glucose monitor or insulin delivery system)?

16. Unrestricted student access to a personal phone for a medical reason?

17. Unlimited access to snacks or food for a medical reason?

18. Unlimited access to washrooms during class?

19. Re-scheduling of assessment if medically impacted (experiencing hypo/hyperglycemia) or excused from class for a medical reason?

Staff Training Presentation

20. Has your school district provided the opportunity to attend or review the *General Information about Diabetes for School Personnel* presentation?

21. Have you attended or reviewed the *General Information about Diabetes for School Personnel* presentation?

First Aid Person at School

22. Are you a designated first aid person in your school? (logic branch – if yes, Q23 – if no, Q28)

First Aid Support for Students with Type 1 Diabetes

23. Have you ever helped a student with Type 1 Diabetes in a first aid capacity?

24. Have you received training specific to Type 1 Diabetes (such as emergency procedure or administration of glucagon)?

25. There is a recently developed website with information about Type 1 Diabetes called *Diabetes At School* - have you ever done training on this website? (logic branch – if yes, Q26 – if no, Q27)

Diabetes at School Website

26. What level of training did you complete?

Level 1 : Awareness

Level 2 : Literacy

Level 3 : Expertise

27. Would you be willing to do Professional Development learning from the Diabetes at School website?

Access to First Aid Support for Students with Type 1 Diabetes

28. Have you ever needed to access a first aid person in the school on behalf of a student?

29. How confident are you that students have timely access to a person with first aid training?

30. There is a recently developed website with information about Type 1 Diabetes called Diabetes At School - have you ever done training on this website? (logic branch – if yes, Q31 – if no, Q32)

Diabetes at School Website

31. What level of training did you complete?

Level 1 : Awareness

Level 2 : Literacy

Level 3 : Expertise

32. Would you be willing to do Professional Development learning from the Diabetes at School website?

Demographic Information

33. How many years have you been teaching?

This is my first year 2-5 years 6-10 years 10+ years

34. In which general area do you teach most of the time? (Choose one)

Sciences Physical Education / Health

Humanities Other

Fine Arts

(logic branch – if PHE, Q35 – if any other response, Q38)

Physical Education Department

35. How confident are you in the process of identification of a student with Type 1 Diabetes in your class?

36. If a student had a hypoglycemic (low blood sugar) incident in class, how confident are you with access to fast acting sugar (i.e. juice, dextrose tablets) for treatment?

37. If a student had a severe hypoglycemic (low blood sugar) incident in class, how confident are you with access to an emergency glucagon kit?

Support for Teachers

38. What resources would make it easier to support students living with Type 1 Diabetes at school?

39. Is there anything else that you would like to share towards supporting students living with Type 1 Diabetes at school?

Principals and Vice Principals

40. How would you describe your current level of knowledge about Type 1 Diabetes?

41. Have you ever had a student enrolled in your school who had Type 1 Diabetes?

42. How confident are you in the process of identifying students with Type 1 Diabetes to all staff (including teachers on call)?

Policies for Type 1 Diabetes

43. How familiar are you with the *Provincial Standards of Diabetes Care in the School Setting* document?

44. How confident are you that your staff has attended or reviewed the *General Information about Diabetes for School Personnel* presentation?

45. Are there posters for *Managing Low Blood Sugar* in visible locations around the school?

46. How confident are you that at least two school personnel have been trained in emergency procedure of administering glucagon in case of a severe hypoglycemic (low blood sugar) incident?

Additional Resources for Principals and Vice Principals

47. What resources would make it easier to support students living with Type 1 Diabetes in your school?

48. Is there anything else that you would like to share towards supporting students living with Type 1 Diabetes?

Thank you for your participation in this research study!

I appreciate your time and insights!

If you would like more information on how to support students living with Type 1 Diabetes at school, please check out the website Diabetes At School developed by the Canadian Paediatric Society or refer to the following online posters:

[How Teachers Can Support Students with Type 1 Diabetes](#)

[Low Blood Sugar: What it is and what to do](#)

[High Blood Sugar: What it is and what to do](#)