UNIVERSITY of WORCESTER
Worcester Research and Publications

Physical Activity Experiences of People with Type 1 Diabetes across the Life Course

Item Type	Article (Accepted Version)
UoW Affiliated Authors	Richardson, Emma
Full Citation	Richardson, Emma , Bright, C., Farrow, D. and Nathan, H. (2026) Physical Activity Experiences of People with Type 1 Diabetes across the Life Course. Adapted Physical Activity Quarterly, AOP. pp. 1-10. ISSN Print: 0736-5829 Online: 1543-2777
DOI/ISBN/ISSN	https://doi.org/10.1123/apaq.2025-0111
Journal/Publisher	Adapted Physical Activity Quarterly Human Kinetics
Rights/Publisher Set Statement	Manuscript has been published online as Ahead of Print: Accepted author manuscript version reprinted, by permission, from Adapted Physical Activity Quarterly, 2026, https://doi.org/10.1123/apaq.2025-0111. © Human Kinetics, Inc. Article made available upon publication without embargo as per https://journals.humankinetics.com/page/copyright/copyright-and-permissions
License	n/a
Link	https://journals.humankinetics.com/view/journals/apaq/aop/article-10.1123-apaq.2025-0111/article-10.1123-apaq.2025-0111.xml

For more information, please contact wrapteam@worc.ac.uk

Physical Activity Experiences of People with Type 1 Diabetes across the Life Course

Emma. V. Richardson[a*], Christopher Bright[b], Daniel Farrow[b], & Hilary Nathan[b]

*Corresponding author: e.richardson@worc.ac.uk

[a]School of Sport and Exercise Sciences, University of Worcester, St John's Campus, UK, WR2 6AJ

[b]Breakthrough T1D, https://www.breakthrought1d.org/

Physical Activity Experiences of People with Type 1 Diabetes across the Life Course

Abstract

This study offers novel and significant insights to advance understanding, practise and policy regarding physical activity (PA) across the lifespan among individuals with Type 1 Diabetes (T1D) in the United Kingdom (UK). Utilising both medicalised and socio-cultural lenses, we aimed to (1) examine the PA experiences of people with T1D; and (2) explore the meanings of PA across the life course. The qualitative testimonies of a 311 participants aged 3–75 were analysed using reflexive thematic analysis across age-based case studies. We identified why PA becomes meaningful at particular life stages, and how experiences are shaped by intersections of technology use, social attitudes, healthcare transitions, body image, and identity. Participants of all ages described navigating stigma, institutional misunderstanding, and internalised ableism, often heightened with age. We conclude that the T1D community remains underserved by current approaches, and call for targeted policy, practitioner training, and lifespan-oriented research that fosters inclusive and empowering PA opportunities.

Keywords: diabetes; wellbeing; health; intersectionality; aging

Type 1 Diabetes (T1D) affects over 9.4 million people worldwide, including approximately 430,000 in the UK (T1D Index, 2024; Diabetes UK, 2024). This chronic autoimmune condition destroys insulin-producing β cells, requiring individuals to manage glucose levels through insulin injections or insulin pumps and, more recently, the use of monitoring equipment such as continuous glucose monitors (CGMs) (Scibilia et al., 2024). Challenges with management can lead to acute complications like hypoglycemia, hyperglycemia, or diabetic ketoacidosis, and long-term issues such as neuropathy, nephropathy, cardiovascular problems, and cognitive decline (Whicher et al., 2020). As T1D is a lifelong condition, managing it effectively across different life stages is a priority (Morris et al., 2023). Recent data highlights the stark impact of T1D on quality of life, with UK individuals losing an estimated 15 years of healthy life on average (T1D Index, 2024). Notably, this loss exceeds 50 years in some low-resource settings and the global average of healthy life lost is 15 years - underscoring the urgent need for interdisciplinary efforts to not just extend life, but healthy years for people with T1D (T1D Index, 2024).

Physical activity (PA) is one of the most effective strategies for supporting T1D management alongside insulin regulation (Riddell & Peters, 2023). Rather than a biomedical lens, we define PA under Piggin's (2020) broader definition: "Physical activity involves people moving, acting, and performing within culturally specific spaces and contexts, influenced by unique interests, emotions, and relationships" (p. 5). Arguably, this definition of PA is more empowering and reflexive of lived experience as it acknowledges its social, cultural and political boundaries, and emotional significance.

An underrepresentation of individuals with T1D in PA spaces compared to peers without T1D is well documented in the literature. For children with T1D participation in PA, including physical education (PE), is often hindered by fear of hypoglycaemia, the complexity of glucose management, embarrassment, and limited support from educators

(Brazeau et al., 2008; Riddell et al., 2017; Kennedy et al., 2018). Conversely, targeted education, trained and supportive teachers, social encouragement, and structured PE environments can act as facilitators by fostering confidence, motivation, and safe engagement in PA (Brazeau et al., 2014; Kilbride et al., 2011). Similar findings are evident in adulthood, where fear of hypoglycemia, the burden of glucose monitoring and insulin adjustment, low confidence, insufficient professional guidance, and negative social interactions often limit PA participation (Brazeau et al., 2008; Riddell et al., 2017; Kennedy et al., 2018). In contrast, patient education, knowledgeable health professionals, social support, and structured PA programs can enable participation by enhancing confidence, self-efficacy, and safety (Brazeau et al., 2014; Kilbride et al., 2011).

Collectively, this body of research highlights the social, cultural, and political complexities shaping the experiences of people with T1D across the life course, yet important gaps remain. First, the PA experiences of the T1D community are predominantly represented by children, adolescents, and young adults, leaving the perspectives of those in early and mid-adulthood, as well as middle and older age, underexplored, despite the importance of sustaining health and wellbeing with aging (T1D Index, 2024). Second, there is a lack of attention to the contextual experiences and meanings of PA as they intersect with age and broader social, cultural, and political influences (e.g., work, family roles, physiological changes in T1D, and policy decisions on inclusion). A focused examination of T1D can significantly contribute to wider scholarship on chronic illness and PA across the lifespan.

Examining PA in the context of chronic illness requires attention to sociopolitical factors, cultural norms, and life course changes (Charmaz, 2006). For example, studies on multiple sclerosis (MS) have demonstrated how societal narratives around PA shape individuals' experiences. Adamson et al. (2018) found that people with MS often experienced guilt when relapses occurred, feeling responsible for not doing enough PA or choosing the “wrong” activities. This reflects the political dimension of PA and chronic illness in Western contexts. Neoliberalism shapes how health is pursued and defined, disproportionately harming disabled and chronically ill populations by overlooking social, cultural, and political barriers (Adamson et al., 2022). Neoliberalism frames health as an individual responsibility and personal choice. When people cannot achieve these standards, they are often blamed for poor self-control, lack of discipline, or ‘bad’ lifestyle choices—obscuring structural issues of privilege, exclusion, and marginalisation (Harrison, 2021). Further, Crawford (1980) described healthism as an ideology that places responsibility for health on individual lifestyle choices, obscuring the social and economic determinants of illness. This logic aligns with neoliberalism, which frames citizens as self-managing consumers and shifts health from a collective responsibility to a personal moral obligation. Thus, when impairment progresses, relapses, or illness emerges, citizens can foster guilt, self-blame or internalised ableism that their decisions are the cause, rather than socio-cultural issues of exclusion or health inequities (Adamson et al., 2022). Internalised ableism refers to the process by which disabled or chronically ill individuals internalise negative stereotypes, prejudices, and societal beliefs that construct disability as inferior, deficient, or undesirable, leading them to view themselves as inadequate or at fault for not conforming to ableist norms (Campbell, 2009). For people living with T1D, this is intensified by “compulsory able-bodiedness” (McRuer, 2002) or “compulsory abledness” (Campbell, 2009), wherein cultural expectations of constant independence and self-regulation frame any need for support, or deviations in glycaemic control, as individual failure rather than a consequence of managing a complex chronic condition.

The addition of exploring T1D and PA across the life-course complements this literature by providing a different condition and context (the UK), but with a similar appreciation; advancing understanding, practise and policy regarding PA and chronic conditions across the lifespan requires both medicalised and socio-cultural lenses to serve these communities to live their best lives. This research was underpinned by three aims: (1) Examine the PA experiences of people with T1D; and (2) Explore the meanings of PA across the life course.

Method

This research was designed and commissioned by [removed for peer review], a UK-based diabetes charity. It was a one-year, exploratory, mixed-methods study utilising an online survey to examine the experiences and meanings of PA across the life course among the T1D community in the UK. This paper focuses exclusively on the qualitative survey responses, while in-depth quantitative findings are reported elsewhere [removed for peer review].

This study was underpinned by an interpretivist paradigm (Bryman, 2016), grounded in ontological relativism (Garrison, 2002) and epistemological constructionism (Burr, 2015). These assumptions recognise that participants' experiences and meanings of PA are shaped by their unique contexts, including upbringing, culture, and life history, and that the researchers play an active role in interpreting these meanings. Accordingly, the findings presented here are co-constructed by participants, societal narratives, and the researchers' positionality. We also acknowledged that we, as 'tools' of qualitative analysis (Braun & Clarke, 2021), had preconceived assumptions, opinions, knowledge and experiences that would influence the data e.g., personal experience of T1D, knowledge of aging, PA, and chronic conditions. Further, the testimonies of those aged between 0-17 years are a mix of parents speaking on behalf of their child and older children answering for themselves. We emphasise to readers that testimonies from parents may not be reflexive of the child's own experience and meaning making. We ask therefore that readers take such testimonies as reflexive of guardian perspectives of their child's experience.

Authors B, C and D scoped and commissioned the research, as well as consulting on initial research questions. Author A acted as an 'outsider', analysing the data independently. Author A is a female scholar passionate about qualitative research, equitable access to PA, and opportunities for wellbeing among disabled and chronically ill populations. She works with a range of disabled communities, but previously specialised in MS and spinal injuries thus providing some insight into living with a chronic condition. Further, she lives with permanent nerve damage in cervical and lumbar regions of her spine resulting in chronic pain and right sided weakness, managed through a regime of medications, diet, and PA thus providing some relationality to the phenomena of managing a chronic condition through lifestyle.

Author B is Community Partnerships and Events lead at [removed for peer review], founder of [removed for peer review], and has lived with T1D for 25 years. He has played football from grassroots through to representing his nation in Futsal, so has experience of managing the condition though his lifetime as well as at many different levels of sport, providing insight of how the condition is supported and perceived in the UK's largest sport. He manages his condition with an insulin pump and CGM, thus understanding the impact of both older and newer technology utilised to manage T1D. With his previous research focussing on the area of stigma, peer support and disability identity within T1D [removed for peer review], Author B also has empirical and lived knowledge of the area.

Author C [position removed for peer review] brings both professional and personal insight, having lived with T1D for more than 20 years. His work focuses on supporting people of all ages and stages of T1D by improving access to trusted information, building supportive community connections, and enabling them to thrive—through partnerships with the National Health Service (NHS), healthcare professionals, charities, and industry. Drawing on this lived experience and professional perspective, he contributed critical insights into the nuances and interconnectedness of the issues addressed in this paper.

Author D is Director of Policy and Communication at [position removed for peer review] and leads strategic efforts to ensure that the voices of people living with T1D are represented in policy and practice. She is passionate about advancing research that helps prevent, cure and manged T1D, and improving this communities access to this information.

Ethical Considerations

Ethical approval for this study was granted by [removed for peer review]. All participants provided informed consent, and parents or guardians consented on behalf of minors. Participants were informed of their right to withdraw at any time and assured that their responses would be anonymized. Given the sensitivity of health-related topics, the survey design allowed participants to skip any questions they were uncomfortable answering. We acknowledge the ethical implications of our positionality as researchers connected to the subject matter, and mindful of balancing empathy with objectivity in our interpretations.

Data Collection

The English-language survey, designed by [removed for peer review], was distributed via email lists and social media, targeting individuals diagnosed with T1D. Participants ranged from 3 to 75 years old (average age 30), with younger respondents either completing the survey with parental help or through their parents. A total of 311 participants completed the survey: 161 female, 147 male, 2 non-binary, and 1 undisclosed gender. Most lived in England (239, 77%), with smaller groups in Scotland (33), Wales (11), Northern Ireland (9), and 15 British citizens living outside the UK. Four participants did not disclose location. Age distribution was: 0-18 years (119, 38%), 18-24 (22, 7%), 25-34 (33, 11%), 35-44 (54, 17%), 45-54 (52, 17%), and 55+ (31, 10%). These ages were determined a priori by [removed for peer review] through discussion with Authors B, C and D, with age groups chosen based on important transitions of T1D care and life responsibilities.

Four open-ended questions formed the qualitative basis: 1) What physical activities do you engage in? 2) What motivates you to engage in PA? 3) What discourages you from engaging in PA? 4) Have you experienced anything else impacting your attitudes toward PA? Questions were informed through literature on PA and T1D, and the past and current work of [removed for peer review], and Authors B and C who have lived experience participating in PA with T1D acting as consultants to refine the questions so they spoke to those with T1D.

These questions followed Braun & Clarke's (2021) guidelines for survey-based qualitative data collection using open-ended responses. Survey-based qualitative methods enable researchers to capture diverse geographic and social perspectives (Neville et al., 2016). This approach is particularly valuable as it offers anonymity, flexibility in timing, and allows participants to control the extent and pace of their disclosure, thereby supporting broader and more diverse engagement (Thomas et al., 2024). The value of this approach is evident in T1D research, where it has been employed in studies by Quintal et al. (2020) and Yang et al. (2024). The study achieved broad representation across age, aligning with the project's goal to explore PA experiences across the life course for people with T1D. While individual responses lacked the depth of interview data (range = 1-175 words), the large participant number provided breadth of insight. All participants were ascribed pseudonyms.

Data Analysis

The data were analysed using reflexive thematic analysis (RTA), fitting the study's interpretivist framework. RTA's flexibility suits large descriptive datasets from survey-based qualitative research (Braun & Clarke, 2021) and allowed the authors to incorporate their lived experiences, adding depth to findings. Separate RTAs were conducted for each age group as collective case studies to capture experiences at distinct life stages. Authors A and B led the data analysis and writing of the paper, with Authors C and D acting as “critical friends”. In this role, they helped shape the paper through their respective professional foci so that its recommendations and results highlighted the need for equitable, diverse, and inclusive strategies in education, research, and policy—ultimately serving as a driving force for [removed for peer review] and other T1D advocates.

As a whole, the data were analysed abductively. Although the survey questions aligned to specific topics (e.g., barriers, enablers), Author A—who had not been involved in the creation of the questions—led the analysis by inductively and openly coding data based on its content rather than predetermined frameworks or theories. The process began with initial coding wherein Author A openly coded and developed preliminary themes for each group. Second, Author A presented her findings to Author B to illustrate and explain the “story” of each age group. Third, both authors engaged in critical friendship and contextualisation wherein Author B acted as a critical friend, offering additional interpretation and context informed by his lived experience. For instance, Author A initially created a theme titled “heightened fear” of doing PA among persons aged 18–24 years. Author B contextualised this by explaining that age 18 is regarded as a period of “transitioning” in the community, when individuals with T1D typically move from paediatric to adult care. This often coincides with moving out for university and managing independent care, thereby intensifying fears and difficulties. Together, they renamed the theme “Medical and Social Transitions.” Forth, Author A refined and rewrote themes and subthemes for each age group. She selected quotations to illustrate the themes/subthemes, using one or two examples where data were rich, and more numerous quotations where the data were thinner, to demonstrate the evidence underpinning each theme. Fifth, after completing each age group with a narrative and reference to literature, Author A shared the working document with Author B for revisions and further insights. This was a process with multiple cycles of rewriting and editing. Sixth, once the analysis was complete, Authors A and B sent the full paper to Authors C and D for critical friendship. They were specifically asked to review for clarity, resonance with lived experience, coherence of the overall narrative, and alignment with the aims of the commissioned research. Finally, Authors C and D provided feedback and suggestions addressing broader requirements of the T1D movement, ensuring that the paper contributed meaningfully to advocacy and guidance for future research and practice.

Findings and Discussion

The findings are written describing the ‘why’, ‘how’, and ‘so what’ of PA at specific ages, thus adding significance and novelty to the literature by amplifying how PA is made meaningful through the lifecourse. We present our findings in a chronological manner, building case studies of PA among the T1D community at ages: (i) 0-17 years: Always Plugged in to Monitors; (ii) 18-24 years: Medical and Social Transitions; (iii) 25 – 34 years: Continued Stigma and its Impact on Adulthood; (iv)35 - 44 years: T1D Changes and Physiological Aging; (v) 45 – 54 years: T1D Burnout and Aspiring to Live Well; (vi) 55 +: Combatting the Body and Social Stigma to Keep Active

0-17 Years: Always Plugged in to Monitors

PA for those aged 0-17 is deeply influenced by the presence, support, and actions of others such as parents, coaches, and teachers (Kennedy et al., 2018). The data in this research also highlighted this, but we wished to focus more deeply on the meaning and experiences of doing PA as a child or adolescent. Our analysis crafted a theme of being continually ‘plugged in’ to glucose levels through a closed loop or CGM attached to the body. The advancement of technology for managing T1D has been revolutionary in enabling and empowering people with this condition to be active while simultaneously monitoring their levels (Moretti & Morsello, 2017). Of note, 0-17 year olds are in a unique position in that they may never have experience activity *without* this technology. Indeed, this technology shaped show children experienced and made meaning from PA through (1) logistics and compatibility of technology with PA; (2) responses from others; and (3) identity formation.

Logistics and Compatibility of Technology.

The benefits of the technology have been widely noted including to lower the risk of exercise induced hypoglycaemic attacks (Tagougui et al., 2019). However, in this study the visibility of CGMs affected PA enjoyment. Participants discussed being continually 'plugged in' resulted in a dependence on parents, fear of technological failure, and the feeling of constant vigilance. For example, some equipment was not compatible with the activity the child did; "*As Dexcom will not work while swimming there is a need ti*[sic] *leave the pool at every 30min to check bloods*" (Jane, parent of 0-17 year old boy). Second, for many children, the wearing of a device was deemed to negatively impact their performance which resulted in them choosing to take it off while playing; "*The insulin pump is cumbersome to wear during sports, my son takes his pump off during football matches which is ok for an hour then his sugar levels start going very high and he can end up feeling really poorly*" (David, parent of 0-17 year old boy). Third, children's enjoyment of certain activities was impacted due to a fear of the technology being damaged; *"My son doesn't like cycling as he often worries about falling off his bike and landing on his CGM sensor or his pump"* (Margaret, parent of 0-17 year boy). Fourth, at times, children and carers had to fight for allowances in PE or sports club to fully participate:

> “We had a very hard struggle with the PE teachers at school to allow her to carry her handset in a way that made it possible for her to participate. I had to quote the disability act to allow her to be able to wear leggings with side pockets that make it possible for her to run without the handset swinging around. Also to allow the hypo kit to be where the sport was taking place and not in a bag in the changing room where they felt it should be” (Emily, parent of 0-17 year old girl).

The last quote leads to further issues regarding the reaction of other people and lack of education surrounding PA leaders that impacted children with T1D.

Responses from Others

Parents discussed how the support of medical professionals, PE teachers, coaches and peers positively influenced their child’s experience: “*Have previously had good role models in team mates, coaches and pe* [sic] *teachers and great specialist team at hospital*” (Stacey, parent of 0-17 year old boy), The majority of participants, however, discussed key providers of PA lacked knowledge and education of T1D: *“He stopped fencing as the instructor kept commenting about him eating sweets all lesson. He was obviously having them to keep his blood sugar up”* (Amy, parent of 0-17 year old boy); *“The lack of education in teachers/ adults running physical activity means that I sometimes can feel less inclined to do physical activity because I know I will not be properly supported”* (Becky, 0-17 year old girl).

Facilitators such as coaches, teachers, and doctors play a hugely significant role in fostering either a positive or negative experience of PA (Brazeau et al., 2014; Kilbride et al., 2011; West et al., 2025). We conclude the same finding but wish to draw further attention to the deeply troubling attitudes and interactions children with T1D experience that can have a lasting impact into adulthood. That is, the foundations of internalised ableism can begin in childhood and intensify with age which we discuss later:

> "In a previous competitive swimming team my son was not treated on[sic] the same way, there was not an understanding that even than he needs to check his bloods from time to time, he is very capable to swim. He was considered less capable and this was really hard for him as he was doing a huge effort" (Mark, parent of 0-17 year old boy)

Internalised ableism whereby disabled individuals or those with chronic illness believe they are incapable, less than or inferior to non-disabled people can evidently being in childhood. The complex intersection of chronic illness, sport, PE, school policies, and supposed facilitators problematises the neoliberal underpinnings that permeates PE and PA in UK contexts (Enright et al., 2020); how can an individual be 'responsible' for their health when policy and a lack of facilitator training does not permit them to participate?

Identity Formation

As children with T1D often managed their condition using visible devices, this significantly influenced their identity formation. In disability literature, concepts such as "becoming en-wheeled" describe the complex renegotiation of self, following the integration of assistive technologies (Montforte et al., 2021). Similarly, the phenomenon of "cyborgification" examines how visible technologies, such as insulin pumps and CGMs, reshape a person's sense of self and identity (Haddow et al., 2023). Thus, T1D technology can influence the selfhood of children and adolescents as from an early age their concept of identity may become entwined with the wearing of technology that defines them (for others), as someone with T1D and little else.

Testimonies in this paper included PA providing a space for children to feel "normal," fostering a sense of belonging and an active identity: *"Being a 'normal' 10-year-old! Because it's fun and often with friends"* (Amber, parent of 0-17 year old girl). For some, PA also allowed them to forget potential burdens resultant from their diagnosis *"She competes at a* *fairly high standard in gymnastics and it is where she feels she can be herself and forget about her diabetes"* (Nikki, parent of 0-17 year old girl). However, these positive emotional experiences could be tempered by the visibility of their devices, and many children sought to conceal their equipment; *"He wears his pump on his thigh to avoid it being seen"* (Tom, parent of 0-17 year old boy), while others worried about the attention caused by alarms, *"They are worried about people seeing their sensor and hearing alarms going off"* (Polly, parent of 0-17 year old girl).

From childhood, the physical, social and political influences of doing PA with T1D are evident. Children aged 0-17 years experience a complex negotiation of selfhood, normalcy, exclusion, empowerment and disempowerment that is dictated by others such as parents, teachers and coaches. This negotiation increases when they reach early adulthood and experience independent and self-reliance, potentially, for the first time.

18-24 Years: Medical and Social Transitions

This life stage involves significant social and medical transitions that can disrupt consistent diabetes management. At age 18, individuals with T1D typically shift from paediatric to adult care—a process often described as fragmented and challenging (de Beaufort et al., 2023). Research identifies this period as one of "heightened vulnerability" (Saylor et al., 2019, p. 346), due to the interplay of increased autonomy, identity exploration, and risky health behaviours (e.g., binge drinking, neglecting glucose monitoring in social settings). Although national policies—such as the NHS Quality Standards of Transition (2013)—aim to support young people during this shift, engagement with medical services often declines. White et al. (2017) found reduced clinic attendance and follow-up rates in this group. This disengagement may stem from the burden of independently navigating healthcare systems, taking full responsibility for self-management (e.g., scheduling and attending appointments), and attempting to redefine identity beyond the label of "the kid with T1D." To better understand the complexities of this developmental period, two key psychosocial dimensions were examined: (1) striving for normalcy and (2) identity and self-image.

Striving for Normalcy

Some participants noted that being physically active was merely a continuation of what they had always done, with parental influence still a strong aspect of their behaviour; "*This was my lifestyle before I was diagnosed at 16 so I just carried on. All family members do these activities as well so I've been influenced in this way"* (Andrew, aged 18-24). The ability to feel normal could also manifest through others such as teammates or coaches not mentioning T1D allowed them to feel 'normal' and accepted as part of the wider team:

> …the lack of comment from friends and coaches at my sports club has been a benefit – they know I am diabetic but mostly let me get on with things so it never comes up unless I have an issue which lets me feel normal and like I'm being included (John, aged 18-24)

Alternatively, one participant wrote that a main discouragement to PA was, *"Being different. Feeling like when I have to take time out from sport to treat my diabetes my teammates think I'm being lazy or don't want to participate"* (Clara, aged 18-24). Of note, the strive for normalcy was also influenced by participants desire to present a potentially new self rather than *"the kid with diabetes"* (Maddy, aged 18-24) as university was deemed an opportunity to *"become someone new"* (Joe, aged 18-24).

Identity and Self-Image

A strong trend within this age group was body image and others' opinions, particularly when participants had to eat glucose or carbohydrate-based snacks to maintain sugar levels:

> "I don't like eating hypo treatments while at the gym. I have to keep my diabetes kit with me while moving around the gym… If I have a hypo at the gym it means I have to stop & wait so it takes longer overall. If my blood sugar has been on the higher end that day it makes me feel tired & not want to go" (Rose, aged 18-24).

Managing weight can be very difficult for people with T1D due to insulin therapy and other hormones they may be required to take, and this unfortunately can lead to disordered eating, significant appearance concerns and negative mental and social wellbeing (Toni et al., 2017). This experience was described by participants: *"Diabetes and eating disorders e.g. binge eating leading to over exercising to control sugars becomes vicious cycle and body image involved to*[sic] *as is eay*[sic] *to gain weight on higher insulin doses in puberty* (Lara, aged 18-24)*;* "*Being judged as a bigger person trying to lose weight"* (Grace, aged 18-24). Of note, there was a particular anger amongst this group that the perceived judgement and negative interactions they had experienced was due to a lack of education and knowledge; "*Total ignorance re T1D in general and re T1D in relation to physical exercise in the general population.... people are v stupid and v offensive and don't understand the science or anything"* (Christopher, aged 18-24).

These accounts highlight how the transition into adulthood is not only medically and socially disruptive but also shaped by internalised ableism. The desire to "feel normal," conceal visible signs of diabetes management, and avoid being perceived as "lazy" or "different" reflects how dominant societal narratives and neoliberal underpinnings of health regarding productivity, control, and bodily "fitness" become internalised by young people with T1D. The challenges of diabetes management during this life stage are not only logistical or medical but also deeply psychological, tied to how young adults navigate identity, belonging, and stigma in contexts where health and ability are highly moralised.

25 – 34 years: Continued Stigma and its Impact in Early Adulthood

We struggled to find any research focused specifically on PA experiences and the ages of mid 20s to mid 30s. We believe this is an important time of life to explore with regards to T1D as this is also a period of significant transition with potential full time employment, building careers, and growing families which will impact. Of note, participants in this age group discussed consequences of previous PA adherence (or lack thereof) that manifested in contraindications e.g., hypo- and hyper- glycaemic shock, damaged optical nerves, ill health etc. Indeed, Author B had to start wearing glasses at this age which he attributes to poor management in younger years. This shows that, although we are explicitly studying PA experiences at different age ranges, there is a legacy of PA experience that informs each age. This is evident from findings of (1) experiencing continued disorders, and (2) continued exposure to 'comments'.

Experiencing Disorders

Previous findings in this paper and literature discussed the disproportionately high prevalence of young people with T1D that had exercise dependency, eating disorders and significant experience concerns (e.g., Toni et al., 2017). Evidence in this study indicates that this can be a prolonged life legacy as some participants discussed still struggling with eating disorders in their 20s and 30s. For example, when asked to respond to what encourages her to be physically active, one participant stated; *"Mainly to maintain physical and mental health, although it's a double-edged sword as it also feeds into an eating disorder"* (Yvonne, aged 25-34).

This is of concern as, according to Hanlan et al. (2013), "Although studies in adults with type 1 diabetes are limited, it is likely that many cases of eating disorders are going undiagnosed in this population." (p. 910). Over a decade later, there is still a significant gap in research focusing on any age group except from adolescents and young adults (<21 years), and the experiences of men. These findings and the evidence from young ages raise wider questions about the cultural and structural forces shaping how people with T1D understand and manage their bodies. Neoliberal discourses of "healthism" place moral value on self-discipline, and, for people with T1D, these expectations may intensify the pressure to regulate the body in ways that become compulsive or harmful. Moreover, the internalisation of ableist assumptions—such as the idea that the "good" diabetic is one who relentlessly self-manages and embodies normative health ideals—can further entrench cycles of guilt, stigma, and self-surveillance when individuals feel they fall short.

Continued Exposure to 'Comments'

Participants aged 24-35 years discussed similar relational issues to those of younger years with regards to participating in PA; *"Stigma, stereotyping, a lack of knowledge & education in those who organise my exercise sessions or sport"* (Ben, aged 25-34 years). Despite being autonomous adults, participants discussed elements of disempowerment when others (e.g., teammates, coaches etc.) interfered with or dissuaded them from participating due to T1D; *"Being singled out for having diabetes and a pump, "watch out for your pump", "oh you might not want to do this move because of your diabetes"* (Fiona, aged 25-34 years). Some participants experienced explicit mockery when they were managing their T1D to compete; "*comments about me being a recreational drug user because I've had to do injections in front of teammates in the past"* (Rich, aged 25-34).

Conversely, some participants used these interactions as motivation to prove these people wrong; *"Anything negative regarding T1D and sport motivates me. I set myself big goals especially with my running now and in terms of performance it would get me going a lot more if I had someone in my ear telling me I can't do it due to be T1D"* (Victoria, aged

25-34). However, the behaviour, or feared behaviour, of others impacted some participants decisions for how to manage T1D while being physically active:

> “It's incredibly hard to put yourself first and manage diabetes properly when you have 22 players + coaches shouting that I need glasses. Often, that forces me to run high during the match in fear that I will go low during the game, forcing me to stop the match and treat the hypo. I doubt many would sympathise and mentally, I'd be letting them down, even if that is daft” (Michael, aged 25-34 years).

Taken together, these accounts illustrate how stigma, stereotyping, and everyday comments from peers, coaches, and teammates continue to shape the PA experiences of adults with T1D well beyond adolescence. While some participants reframed negative encounters as motivation – embodying perhaps a compulsive able-bodiedness to prove worth in a neoliberal world (McRuer, 2002) - others described adapting or compromising their diabetes management in order to avoid embarrassment, judgement, or conflict with teammates. These narratives point to the long-term legacies of bullying, stigma, and disordered eating, and demonstrate how social environments can powerfully shape health behaviours and wellbeing across the lifespan.

By foregrounding the experiences of adults aged 24–35, this study addresses a notable gap in the literature, which has overwhelmingly focused on children, adolescents, and young adults. Little is currently known about how adults negotiate myriad challenges of managing T1D, PA, life responsibilities and how these processes intersect with stigma and relational pressures. This paper therefore contributes to extending the scope of research beyond early life stages, highlighting the need for greater recognition of, and tailored support for, adults with T1D as they continue to engage in PA across different contexts and life phases.

35 - 44 years: T1D Changes and Physiological Aging

Consistent with research on adults aged 25–34 years, we found no published work focusing specifically on adults aged 35–44 years living with T1D and their engagement in PA. This represents a research gap spanning nearly two decades—a critical period marked by substantial life transitions and physiological changes (Strain et al., 2024). Our findings serve as a starting point for more focused research to support PA engagement among a group that experiences both age-related challenges and those related to chronic illness management. Two key themes were identified exploring the experience and meaning of (1) 'comment burnout' and (2) 'new tech vs. old tech'.

'Comment' Burnout

A key finding in all age groups has been that people with T1D have been exposed to unhelpful and stigmatising comments from peers, facilitators, professionals and others in the activity space. At 35-44 years of age, the tonality of describing these experiences changed to one of fatigue and burnout from having been subject to such comments for, at times, 4 decades; *"Comments on stopping to check BGs or eat a snack (to treat a hypo); "other people (!) commenting. Tired after decades of same comments and jokes"* (Stephen, aged 35-44).

> "…other people at classes and clubs not understanding type 1 diabetes. I was once shamed in a fitness class for drinking lucozade. The instructor shouted at me and said that is why I'll never shift the weight, pointing at my lucozade. My blood was 1.9" (Annie, aged 35-44).

Many participants seemed to have embodied these comments; "*Having a hypo and having to stop or slow and feeling like I'm ruining the activity for other"* (Rosie, aged 35-44).

New Tech/ Old Tech

Participants at this age were somewhat in the middle of using newer technology such as pumps and CGMs, and older technology such as injections and finger pricks to manage T1D. For some, the CGMs were motivating as they could physically see the effects of activity; *"I have found that I can see in my blood glucose management when I am regularly active and when I am not and that gives me motivation to get more active"* (Derek, aged 35-44). However, others were concerned that newer technology would malfunction while doing activity; *"Fear of my diabetes tech malfunctioning during exercise eg*[sic] *in water or in hot weather. Having to treat a hypo while exercising discourages me from continuing"* (Laura, aged 35-44). Of note, participants stated that while there is a large amount of information currently available about PA with pumps, there is little regarding activity while using MDIs:

> There is a lot of information nowadays about insulin pumps and activity, but not as much about how to manage it on MDE[sic]. I came off a pump as it wasn't right for me and my general control is much better on MDI, but I'm keen to nail the exercise which can be a challenge. (Dan, aged 35-44).

This age group represents a time of life with significant physical, T1D, and life changes that has not yet been given enough focus. The experiences of adults aged 35–44 highlight how decades of stigmatising comments can accumulate into fatigue and burnout, with some participants internalising ableist narratives that frame essential self-management practices as disruptive or shameful. These findings point to the wider influence of neoliberal healthism, where responsibility for health is individualised and behaviours such as pausing to treat a hypo are judged against cultural ideals of control, thinness, and productivity. The mixed experiences with diabetes technologies further show how access to and perceptions of "good" management are socially and culturally mediated rather than purely clinical. This study therefore fills an important gap by drawing attention to the underexplored mid-life stage, demonstrating how stigma, internalised ableism, and broader health discourses shape physical activity experiences for people with T1D well beyond adolescence.

45-54 Years: T1D Burnout and Aspiring to Live Well

Most research on older adults with T1D focuses on insulin sensitivity, resistance, or latent autoimmune diabetes in adults (LADA) (Pratley et al., 2020). While valuable, more studies are needed on how to live well with T1D to support healthier, longer lives (Dhaliwal & Weinstock, 2014). Managing chronic illness in midlife means navigating relational, systemic, and physiological challenges—many of which intersect with efforts to maintain regular physical activity. We explored these further through two subthemes: (1) getting specific and (2) T1D burnout.

Getting Specific

Participants in this age are more likely to experience a change in the way insulin and sugar react in their body (Pratley et al., 2020), and this impacted how participants in middle age experienced PA - presented above. This created a fear amongst previously active participants that had were now experiencing hypos regardless of their management efforts:

> “During many more strenuous physical activates[sic] I do not notice or simply do not get any hypo symptoms. Non-strenuous activities like walking I might end up with a hypo but not a problem at all other times. This is a huge worry for me” (Marion, aged 45-54)

Participants that did different activities also wanted more specific and tailored information regarding how to manage T1D to assuage fears; “*My blood sugars behave differently with different sports. The advice given needs to be more tailored. e.g. my blood sugars can easily drop by 1-2 mmol / minute out running…It can make exercise very scary”* (Norman, aged 45-54).

T1D Burnout

The addition of T1D changes as well as managing a chronic condition created a phenomenon of burnout for many participants in this age range:

> “I seem to have insulin resistance after 40years, I am really tired and I'd love a fekkin[sic] day of doing nothing, I'd love a workday of being able to sit and do sweet fekk[sic] all! I'd LOVE to be able to go to college and sit in lectures and STUDY and not watch my blood sugars siar[sic] and get stuck instead of having to throw myself into physical work every bloody day” (Chloe, aged 45-54).

While some burnout was related to managing a changing condition, others were related to a lifetime of comments from others. Similar to participants aged 35-44 years, the tone of testimonies regarding these experiences had become more frustrated:

> “Me explaing[sic] about it and what to do but because it is easier for others to ignore and pretend they don't understand and then when it suits to make comments that are seen to be reasonable but actually undermines me to others!” (Karen, aged 45-54)

For the first time, participants’ testimonies indicated a weariness and burnout from having to interact and deal with other people:

> “Burnout. It's hard to be motivated to exercise when you're buried under the weight of simply getting through each day. Type 1 "influencers" add to the guilt of not being active enough. Exercise is good, but so is having the strength to say no when you are physically, emotionally and mentally unable to face the…world or other people.” (Rachel, aged 45-54)

Some participants got to the point where they ignored others to prove they did not need help, which at times resulted in a hypo:

> "I find it frustrating when friends constantly ask if I am OK when physically active. Sometimes this makes me more likely to ignore my diabetes in an effort to prove that I am as able as they are and this has resulted in prolonged hypo on occasion" (Niamh, aged 45-54)

Overall, the accounts of adults aged 45–54 illustrate how living well with T1D in midlife involves navigating layered physiological, emotional, and social challenges. Despite strong motivation to remain active for long-term health and independence, participants faced barriers linked to aging, comorbidities, caregiving roles, and the unpredictable effects of insulin resistance. Burnout—both from the physiological demands of diabetes management and the cumulative weight of decades of stigma and comments—emerged as a defining theme, often compounded by neoliberal healthism and the moralisation of exercise, which left some participants feeling guilty or selfish when prioritising their own wellbeing. At times, these pressures contributed to internalised ableism, with individuals pushing through risk or ignoring symptoms in an effort to appear "as able" as others– highlighting again neoliberal and healthism tenets of the culture. By centring this midlife stage, our study addresses a critical gap in the literature, showing how aspirations to sustain health and activity are shaped not only by biological changes but also by entrenched social expectations, cultural ideals of discipline and productivity, and the enduring labour of self-management across the life course.

55 Years +: Combating the Body and Social Stigma to Keep Active

Past research has highlighted specific phenomena experienced with T1D and older age such as increasing insulin resistance with age, or living LADA. (Fourlanos et al., 2005; Naik & Brooks-Worrell, 2019). Such experiences arguably destabilise confidence of PA as techniques and strategies that allowed for enjoyable and safe activity may no longer work

(Brazeau et al., 2018). To add to this literature, we contribute two important experiences expressed by this age group; (1) unpredictability, and (2) comments never stop.

Unpredictability

This population were unique in experiencing a very complex interplay of multiple chronic conditions and management strategies that made being physically active challenging as their experiences did not align to stated guidance. For example, some participants posed that they had LADA, a similar but different condition to T1D, that accounted for their experiences not matching T1D guidance; *"managing hypo risk given that aerobic vs anerobic I[sic] exercise blood sugar impact is different and not always predictable.   I believe my diabetes is LADA hence doesn't seem to follow standard guidance for Type 1s"* (Sean, aged 55+)

Further, the time and effort preparing to be active was a frustration for some when hard worked strategies were no longer reliable:

> I find all the preparations (e.g. setting temporary basal rates in advance of exercise, thinking about timing of exercise in relation to meal boluses, considering the type and quantity of carbs consumed pre and post exercise etc) a great burden and, despite working so hard to apply the strategies for exercise, it makes me very angry that they are so unreliable! (Gary, aged 55+)

This unpredictability also transferred to more advanced technology when altering activities, leading to a fear of being a burden:

> "Confusion one how to maange[sic] my closed loop pumping system in regards to different levels and types of activity. Also my fear that I will cause problems if I do group activities by having a hypo or some other problem with my T1d (pump management for example) while on a hike" (Shona, aged 55+)

This may explain why, like all other age groups, participants aged 55+ were fearful of ableist comments and criticisms from peers.

Comments Never Stop

The key imbedded experience people with T1D have across their lifetime is the ableism they experience from others. This, arguably, is the golden thread of relational PA experience that must be addressed to support this population be active throughout the life course. Comments regarding what participants are eating remain; "*I carry glucose with me when I exercise and frequently this is met with the comment "can you eat that?"* (Isla, aged 55+), as well as explanations about why one utilises certain strategies; "*Increased challenge of blood sugar management & social stigmas- having to explain myself... is very wearying"* (Cath, aged 55+).

Participants also discussed social narratives of T1D that shape how others' expect them to act; "*People think you should just be able to manage it easily. After all there are some diabetic athletes so why can't you! I wish my diabetes was that easy to manage, but it isn't!"* (Claudia, aged 55+). This alludes to an issue seen in the wider disability sport literature regarding expectations to be a "supercrip"; an individual that defies the odds and promotes a positive identity with disability or chronic illness (Berger, 2008), that can distort realistic experiences of challenges living with conditions, and motivations of PA from health and fun to elitism, competition and results (Silva & Howe, 2012).

Despite decades of managing T1D, participants continued to report the persistence of ableist comments, reflecting a lifetime of external scrutiny that, over time, can be internalised as shame, guilt, or pressure to "prove" ability. These pressures intersect with neoliberal healthism, where responsibility for health is individualised and reinforced by cultural ideals of productivity and "successful aging," and with the "supercrip" narrative that demands exceptional performance rather than acceptance of limitation. In this context, managing unpredictability—whether physiological, technological, or relational—becomes not only a clinical challenge but also a socio-cultural burden. By foregrounding the voices of older adults, this study addresses a significant gap in the literature, showing that supporting active aging with T1D requires more than biomedical guidance: it demands tackling entrenched stigma, resisting unrealistic cultural expectations, and creating environments that affirm sustainable and inclusive participation across the life course.

Recommendations and Conclusions

This study offers critical insight into experiences of PA and T1D across the life course, highlighting how biological, social, cultural, and psychological factors intersect. These findings support Piggin's (2020) argument that PA is not only biological but socially and politically shaped. We argue that research and practice should adopt this holistic perspective, moving beyond medicalised framings that focus narrowly on risk reduction or metabolic control. PA is lived within relationships, environments, and community norms, yet these dimensions remain underexplored in relation to chronic illness. Future strategies therefore need to attend to the social worlds in which people with T1D move and be co-developed with affected communities, especially those facing intersectional inequities.

Participants across age groups reported persistent stigma and internalised ableism, where negative societal attitudes toward disability were absorbed and reproduced. For people with T1D, this often reflected lifelong exposure to comments, misconceptions, and exclusionary practices. These interactions were shaped by cultural ideals that equate adulthood with independence, productivity, and perfect self-regulation. Because T1D management requires visible tools and ongoing monitoring, these norms contributed to shame, hypervigilance, or withdrawal from PA, particularly when self-management strategies became less predictable with age. Many participants also described compulsory abledness (Campbell, 2009): pressure to “prove” capability, outperform peers, or hide difficulty in order to counter stigma. Interventions must therefore recognise how neoliberal healthism and internalised ableism individualise responsibility and create emotional labour that undermines wellbeing.

Identity formation was strongly shaped by early experiences. Being viewed as “different” influenced relationships with food, the body, and movement. Carbohydrate counting, weight-focused messaging and performance-oriented PA cultures—especially in adolescence—intensified body image concerns and, for some, disordered eating. These patterns commonly persisted into adulthood, illustrating the need for integrated psychological and metabolic support from an early stage.

Many participants described cumulative emotional fatigue or “diabetes burnout,” particularly around PA. The need to continually explain the condition, justify devices, and manage other people’s discomfort produced ongoing labour that compounded the demanding work of self-management. Even when participants valued PA, this emotional weight could reduce motivation or confidence. Despite extensive messaging promoting PA, systemic and interpersonal barriers continue to limit access. Participants described uninformed coaching, a lack of appropriate accommodations, and environments where diabetes management was stigmatised or unwelcome. Policy and infrastructure change are therefore urgently needed. PA opportunities must be flexible, safe, and affirming, embedded across schools, sports clubs, workplaces, and community settings, and responsive to the evolving challenges of T1D.

A recurring barrier—what may be described as a golden thread of exclusion—was the persistence of misunderstanding in PA settings. This can only be addressed through sustained education. A coordinated approach is required to challenge stereotypes that position individuals with T1D as fragile or difficult to include. Disparaging or ignorant comments, often repeated across decades, eroded confidence and contributed to internalised ableism. Because these interactions often began in childhood, they shaped lifelong attitudes toward movement and inclusion. Mandatory training for teachers, coaches, fitness professionals, and healthcare providers should include knowledge of how T1D interacts with PA, strategies for inclusive practice, and awareness of how language can stigmatise or shame. Resources must be co-designed with people living with T1D to represent real-world experience and foster empathy. Training should also address psychosocial realities, including identity development and relationships with food and weight.

Future research should prioritise sociocultural perspectives and recognise that PA participation is shaped by intersecting identities such as gender, ethnicity, socioeconomic status, disability, and age. An equity-focused agenda is needed to examine how these identities influence access to PA opportunities and to identify structural barriers such as cost, scheduling, cultural norms, and facility policies. Investigating the practices of gatekeepers—teachers, coaches, employers, and healthcare professionals—will be particularly important. Participatory and co-design approaches with people living with T1D should be central to this work, ensuring interventions and guidelines reflect lived realities. Research must also consider life-course transitions, from adolescence to adulthood and into older age. Studies should explore how identity, fear of hypoglycaemia, and long-term management intersect with social expectations and community resources. Evaluating community-based and culturally tailored strategies, such as peer mentoring and disability-inclusive programmes, will be equally important.

Overall, the relationship between T1D and PA is complex, shaped by physical, cultural, social, and political forces. There is a risk of placing responsibility solely on individuals rather than on systems that should facilitate equitable access. Through inclusive policy, comprehensive education, and multidimensional research, PA can be reframed not as a personal burden, but as a right for all people with T1D.

References

Adamson, B. C., Adamson, M. D., Littlefield, M. M., & Motl, R. W. (2018). ‘Move it or lose it’: Perceptions of the impact of physical activity on multiple sclerosis symptoms, relapse and disability identity. *Qualitative Research in Sport, Exercise and Health, 10*(4), 457–475. https://doi.org/10.1080/2159676X.2017.1415221

Berger, R. J. (2008). Disability and the dedicated wheelchair athlete: Beyond the “supercrip” critique. *Journal of Contemporary Ethnography, 37*(6), 647–678.

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. Sage.

Braun, V., Clarke, V., Boulton, E., Davey, L., & McEvoy, C. (2021). The online survey as a qualitative research tool. *International Journal of Social Research Methodology, 24*(6), 641–654. https://doi.org/10.1080/13645579.2020.1805550

Brazeau, A. S., Gingras, V., Leroux, C., Suppère, C., Mircescu, H., Desjardins, K., … Rabasa-Lhoret, R. (2014). A pilot program for physical promotion in adults with type 1 diabetes: The PEP-1 program. Applied Physiology, Nutrition, and Metabolism, 39(4), 465–471. https://doi.org/10.1139/apnm-2013-0287

Brazeau, A., Rabasa-Lhoret, R., Strychar, I., & Mircescu, H. (2008). Barriers to physical activity among patients with type 1 diabetes. Diabetes Care, 31(11), 2108–2109. https://doi.org/10.2337/dc08-0720

Brazeau, A.-S., Rabasa-Lhoret, R., Strychar, I., & Mircescu, H. (2018). Barriers to physical activity among patients with type 1 diabetes: A systematic review. *Diabetes, Obesity and Metabolism, 20*(3), 585–593. https://doi.org/10.1111/dom.13110

Removed for peer review.

Removed for peer review.

Bryman, A. (2016). *Social research methods* (5th ed.). Oxford University Press.

Burr, V. (2015). *Social constructionism* (3rd ed.). Routledge.

Campbell, F. K. (2009). *Contours of ableism: The production of disability and abledness*. Palgrave Macmillan.

Charmaz, K. (2006). Measuring pursuits, marking self: Meaning construction in chronic illness. *International Journal of Qualitative Studies on Health and Well-being, 1*(1), 27–37.

de Beaufort, C., Gomber, A., Sap, S., & Laffel, L. (2023). From paediatric to adult diabetes care: lost in transition. *The Lancet Diabetes & Endocrinology*, *11*(7), 446-448.

Dhaliwal, R., & Weinstock, R. S. (2014). Management of type 1 diabetes in older adults. *Diabetes Spectrum, 27*(1), 9–13.

Diabetes UK. (2024). *Diabetes: The basics*. https://diabetes.org.uk/about-diabetes

Enright, E., Kirk, D., & Macdonald, D. (2020). Expertise, neoliberal governmentality and the outsourcing of health and physical education. *Discourse: Studies in the Cultural Politics of Education*, *41*(2), 206-222.

Fourlanos, S., Perry, C., Stein, M. S., Stankovich, J., Harrison, L. C., & Colman, P. G. (2005). A clinical screening tool identifies autoimmune diabetes in adults. *Diabetes Care, 28*(4), 971–977. https://doi.org/10.2337/diacare.28.4.971

Garrison, C. E. (2002). Relativism and absolutism: Keeping college students involved in the examination of truth. *College Student Journal, 35*(4), 517–522.

Haddow, G., Åsberg, C., & Timeto, F. (2023). Cyborg figurations: Exploring the intersections of technology, embodiment, identity, and ecology. *Tecnoscienza, 14*(1), 123–154.

Hanlan, M. E., Griffith, J., Patel, N., & Jaser, S. S. (2013). Eating disorders and disordered eating in type 1 diabetes: Prevalence, screening, and treatment options. *Current Diabetes Reports, 13*(6), 909–916.

Harrison, G. (2021). *On the sidelines: Gendered neoliberalism and the American female sportscaster*. U of Nebraska Press.

Kennedy, A., Narendran, P., Andrews, R. C., Daley, A., Greenfield, S. M., & Waheed, G. (2018). Attitudes and barriers to exercise in adults with type 1 diabetes: A qualitative study. Diabetic Medicine, 35(9), 1189–1195. https://doi.org/10.1111/dme.13657

Kilbride, L., Charlton, J., Cox, A., Daley, A., & Campbell, F. (2011). Understanding the experiences of people with type 1 diabetes engaging in exercise: A qualitative study. Practical Diabetes International, 28(4), 163–167. https://doi.org/10.1002/pdi.1584

McRuer, R. (2002). Compulsory able-bodiedness and queer/disabled existence. In S. L. Snyder, B. J. Brueggemann, & R. Garland-Thomson (Eds.), *Disability Studies: Enabling the Humanities* (pp. 88–99). Modern Language Association.

Montforte, J., Smith, B., & Pérez-Samaniego, V. (2021). 'It's not a part of me, but it is what it is': The struggle of becoming en-wheeled after spinal cord injury. *Disability and Rehabilitation, 43*(17), 2447–2453.

Moretti, V., & Morsello, B. (2017). Self–management and type 1 diabetes: How technology redefines illness. *Tecnoscienza – Italian Journal of Science & Technology Studies, 8*(1), 51–71.

Morris, A., Bright, C., Cocks, M., Gibson, N., Goff, L., Greaves, C., ... & Gill, J. M. (2023). Recommendations from Diabetes UK's 2022 diabetes and physical activity workshop. *Diabetic Medicine, 40*(9), e15169. https://doi.org/10.1111/dme.15169

Naik, R. G., & Brooks-Worrell, B. (2019). Latent autoimmune diabetes in adults (LADA). In R. A. DeFronzo et al. (Eds.), *Endotext*. MDText.com, Inc. https://www.ncbi.nlm.nih.gov/books/NBK550706/

Neville, S., Adams, J., & Cook, C. (2016). Using internet-based approaches to collect qualitative data from vulnerable groups: Reflections from the field. *Contemporary Nurse, 52*(6), 657–668. https://doi.org/10.1080/10376178.2015.1095056

Piggin, J. (2020). What is physical activity? A holistic definition for teachers, researchers and policy makers. *Frontiers in Sports and Active Living, 2*, 72. https://doi.org/10.3389/fspor.2020.00072

Pratley, R. E., Kanapka, L. G., Rickels, M. R., Ahmann, A., Aleppo, G., Beck, R., ... & Miller, K. M. (2020). Effect of continuous glucose monitoring on hypoglycemia in older adults with type 1 diabetes: A randomized clinical trial. *JAMA, 323*(23), 2397–2406.

Quintal, A., Messaaoui, R., & Haidar, A. (2020). A qualitative study exploring the expectations of people with type 1 diabetes on their prospective use of a hybrid closed-loop system. *Diabetes Therapy, 11*(10), 2205–2219. https://doi.org/10.1007/s13300-020-00880-5

Riddell, M. C., & Peters, A. L. (2023). Exercise in adults with type 1 diabetes mellitus. *Nature Reviews Endocrinology, 19*(2), 98–111. https://doi.org/10.1038/s41574-022-00756-6

Riddell, M. C., Scott, S. N., Fournier, P. A., Colberg, S. R., Gallen, I. W., Iscoe, K. E., ... & Zaharieva, D. P. (2017). The competitive athlete with type 1 diabetes. *The Lancet Diabetes & Endocrinology, 5*(7), 531–540. https://doi.org/10.1016/S2213-8587(17)30044-6

Saylor, J., Hanna, K. M., & Calamaro, C. J. (2019). Experiences of college students who are newly diagnosed with type 1 diabetes mellitus. *Journal of Pediatric Nursing, 44*, 74–80.

Scibilia, R., Breslin-Brooker, N., Bright, C., Dzikiti, T., Hendricks, S., Shik, V., ... & Vercauteren, J. (2024). Global experiences and personal narratives on diabetes technology and access. *Diabetologia, 67*(10), 2027–2033.

Silva, C. F., & Howe, P. D. (2012). The (in) validity of supercrip representation of Paralympian athletes. *Journal of Sport and Social Issues, 36*(2), 174–194.

Strain, T., Flaxman, S., Guthold, R., Semenova, E., Cowan, M., Riley, L. M., ... & Stevens, G. A. (2024). National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: A pooled analysis of 507 population-based surveys with 5.7 million participants. *The Lancet Global Health, 12*(8), e1232–e1243.

Tagougui, S., Taleb, N., & Rabasa-Lhoret, R. (2019). The benefits and limits of technological advances in glucose management around physical activity in patients with type 1 diabetes. *Frontiers in Endocrinology, 9*, 818.

The Type 1 Index. (2024). *Type 1 diabetes around the world*. https://www.t1dindex.org/

Thomas, S. L., Douglas, H. A., Gajjar, R., & Bennetts, S. K. (2024). Methodological and practical guidance for designing and implementing online qualitative surveys and writing up online qualitative survey data. *BMC Medical Research Methodology, 24*(1), 47. https://doi.org/10.1186/s12874-024-02147-0

Toni, G., Berioli, M. G., Cerquiglini, L., Ceccarini, G., Grohmann, U., Principi, N., & Esposito, S. (2017). Eating disorders and disordered eating symptoms in adolescents with type 1 diabetes. *Nutrients, 9*(8), 906.

West, K., Haegele, J., Zhu, X., & Bobzien, J. (2025). A reflection of experiences of adults with type 1 diabetes in integrated physical education classes: A qualitative inquiry. *Physical Educator, 82*(2), 172–193.

Whicher, C. A., O’neill, S., & Holt, R. G. (2020). Diabetes in the UK: 2019. *Diabetic Medicine*, *37*(2), 242-247.

White, M., O'Connell, M. A., & Cameron, F. J. (2017). Clinic attendance and disengagement of young adults with type 1 diabetes after transition of care from paediatric to adult services (TrACeD): A randomised, open-label, controlled trial. *The Lancet Child & Adolescent Health, 1*(4), 274–283.

Yang, M. C., Chiou, S. T., & Lin, Y. C. (2024). Chronic disease management and prevention experiences of older adults (≥65). *American Journal of Health Promotion, 38*(2), 177–186. https://doi.org/10.1177/08901171231218681