

Exploring the Impact of Wearable Diabetes Technology on Sexual Activity in People Living With Type 1 Diabetes (T1D)

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INTRODUCTION



Type 1 diabetes (T1D) is a complex condition (Acharjee et al, 2013).

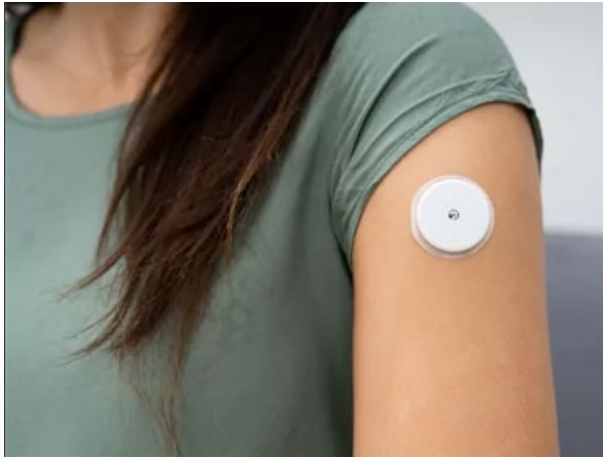


Day to day care involves close monitoring of glucose levels and multiple insulin dose calculations to keep glucose levels within a target range (Bode et al, 2002).



This is essential to reduce short-term and long-term complications associated with diabetes (Papatheodorou et al, 2018).

Examples of wearable diabetes technology to monitor glucose levels known as Flash glucose monitoring & real time continuous glucose monitoring (rtCGM)



Examples of wearable devices to deliver insulin known as Continuous subcutaneous insulin infusion (CSII)





Little research on the impact of wearable diabetes technology on sexual activity.



This research aimed to investigate the literature available on the impact of wearable diabetes technology on sexual activity and identify gaps in knowledge.



BACKGROUND

Guidance

To offer adults with T1D the choice between interstitial (flash glucose monitoring) or rtCGM based on their preference

- (NICE, 2022)

Can be used in those unable to achieve target HbA1c levels with MDI or those experiencing disabling hypoglycaemia.

- (NICE 2008)

Offer devices that reduce the burden of managing the condition, this would include CSII therapy and flash glucose monitoring or rtCGM.

- (ADA/EASD, 2022)

LITERATURE REVIEW

Literature review



Patient Experience Outcome (PEO) Framework was used to develop the research question



“What is the impact of wearable diabetes technology on sexual activity in people living with T1D?”

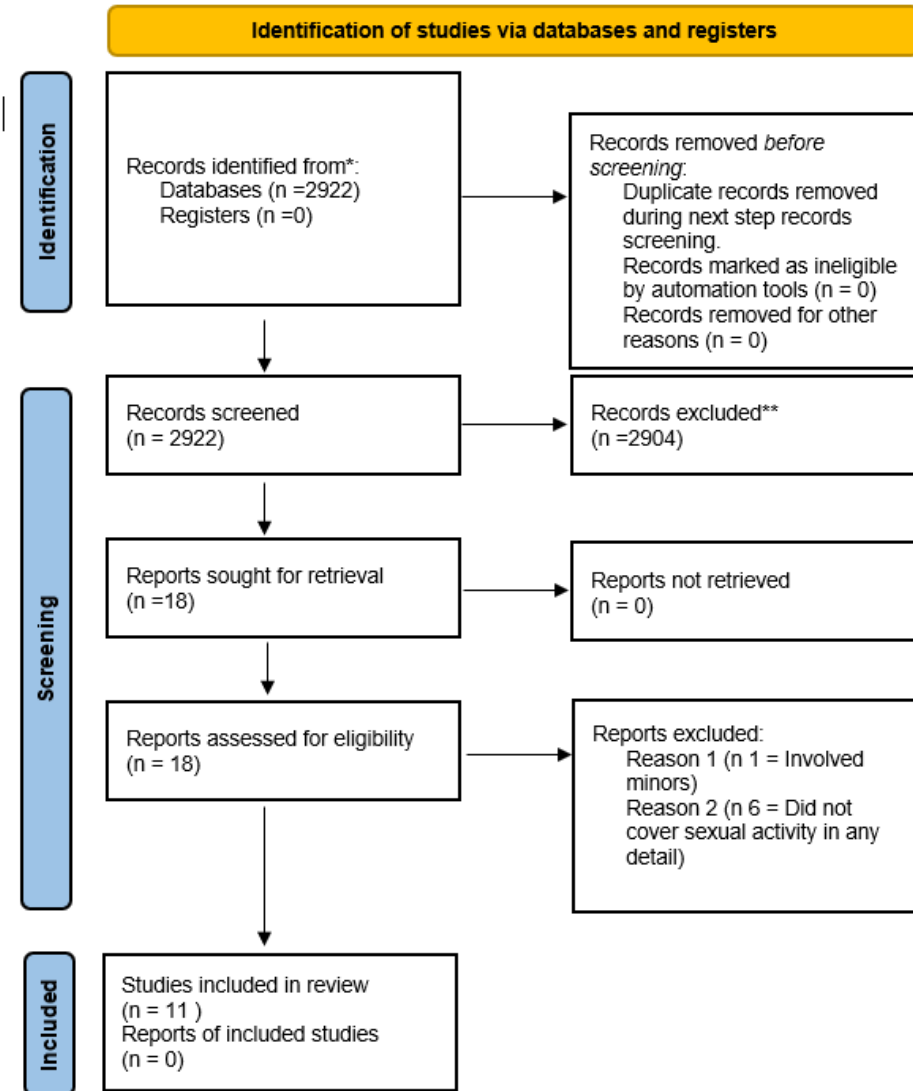


The databases used were Medline, Psych Info and Embase as searching using a single database will not yield all citations (Wilkins et al, 2005).

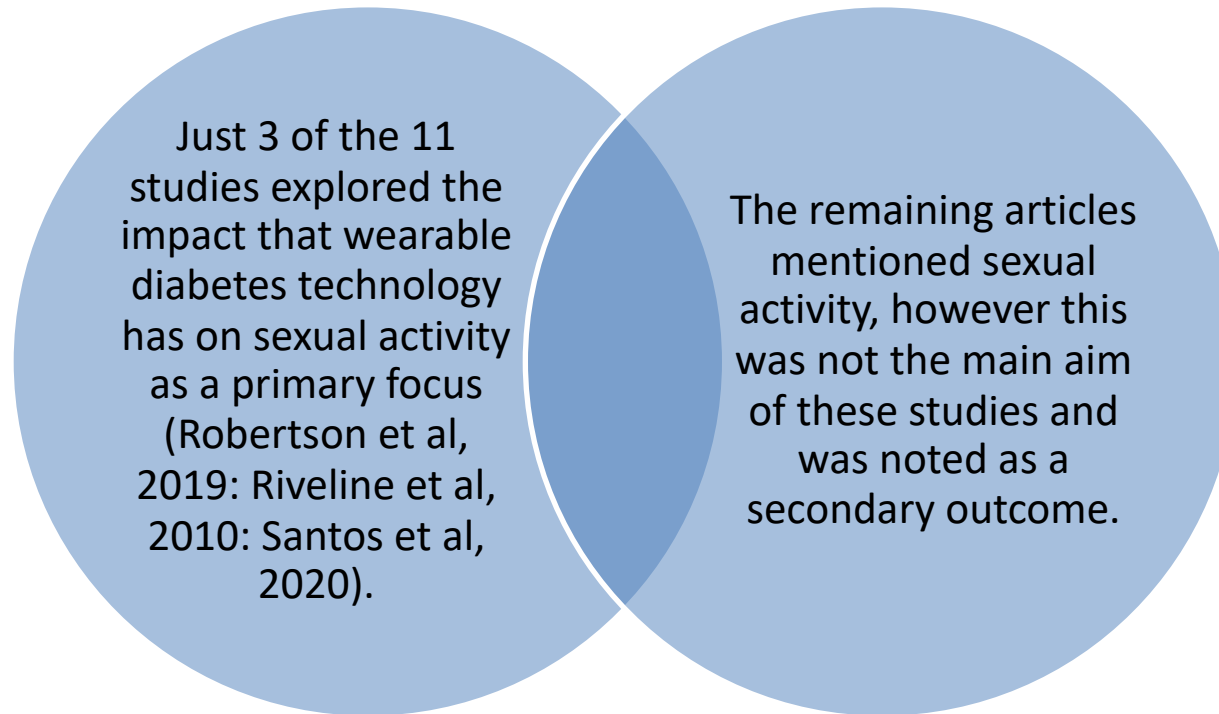
Literature search criteria

Inclusion Criteria	Exclusion Criteria
Studies involving the impact of wearable diabetes technology in participants with T1D	Studies about young people under the age of 18 years due to the ethical implications of discussing sexual activity with minors.
Studies involving the use of wearable diabetes technology on relationships	Studies involving people with T2D, as diabetes technology was not widely available on prescription for this cohort at the time of the search and so patients who were wearing devices would be those self-funding and so would not be a true reflection of the overall T2D population.
Studies involving the use of wearable diabetes technology on sexual activity	

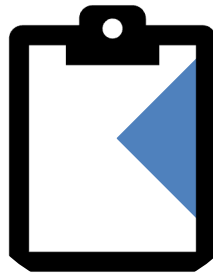
Prisma flow diagram



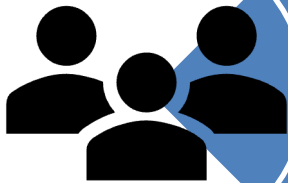
Literature review findings



Study designs



All 3 of the more specific studies used surveys to gather their information, in one paper the authors highlighted this was an anonymous survey and another was identified as an online survey (Robertson et al, 2010: Santos et al, 2020).



Of the remaining 8 studies,

- 3 used surveys in isolation (Riveline et al, 2008: Joubert et al, 2014: Naranjo et al, 2016).
- 1 used a mixed methods design that encompassed a survey and a qualitative component using semi structured interviews (Quintal et al, 2020),
- 2 used interviews in isolation (Cleal et al, 2021: Allen et al 2021),
- 1 used focus groups in isolation (Ritholz et al, 2014)
- 1 used a mixture of focus groups and interviews (Garza et al, 2020)

Findings

- Cannula or infusion site issues
- Disconnection for sex
- Body image
- Sex was a reason for non-adoption of technology

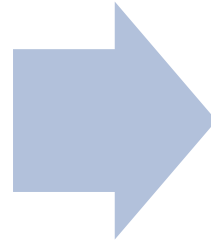
Literature review discussion

- By completing this literature review it became evident that there were no studies found whose primary focus was to investigate the impact of wearable diabetes technology on sexually activity in people living with T1D in the UK context.

METHODS

Research Aims & Objectives

Aims: This study explored the impact wearable diabetes devices had on sexual activity in people living with T1D.



Objectives

- Study the impact of T1 diabetes on relationships
- Examine the impact of T1D on sexual activity
- Research the impact of wearable diabetes devices on sexual partners
- Investigate the impact of wearable diabetes devices on sexual activity
- Explore the discussions that people with T1D have with HCPs about sexual activity and diabetes wearable devices
- Uncover suggestions for the designers of wearable diabetes devices to improve the impact during sexual activity.

Methodology

- The methodology to analyse data collection was framework analysis

Reflexivity and trustworthiness



The author lives with T1D



Many participants were also HCPs



As many participants knew the researcher from social media, The researcher did not discuss their own experiences to try to limit bias.



To support credibility and trustworthiness multiple participant quotes were added into the findings.

FINDINGS

Participants



21 participants were recruited,



12 participants agreed to take part in the research, returned consent forms and scheduled interviews.



1 interview was cancelled



11 interviews were completed, and the data was included in the findings for analysis

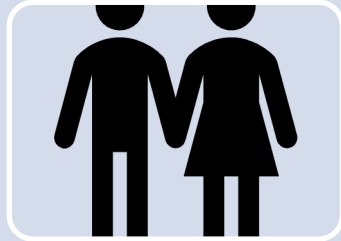
	Number of participants	Percentage of participants
Gender		
Male	5	45.5%
Female	6	54.5%
Ethnicity		
White British	8	72.7%
White Irish	2	18.2%
White other	1	9.1%
Age		
18-29	2	18.2%
30-39	4	36.4%
40-49	1	9.1%
50-59	4	36.4%

Duration of diabetes		
11-19 years	2	18.2%
20-29 years	3	27.3%
30-39 years	2	18.2%
40-49 years	3	27.3%
50+ years	1	9.1%
Education		
Undergraduate	1	9.1%
Degree	5	45.5%
Postgraduate	2	18.2%
Master's	2	18.2%
Doctor of Philosophy (PhD)	1	9.1%

Types of wearable devices used through diabetes lifetime by participants

- Medtronic paradigm veo
- Medtronic paradigm 522
- Medtronic 640g
- Medtronic 670g
- Medtronic 780g
- Dana I
- Roche Accucheck insight
- Roche Combo
- Tslim
- Animas vibe
- Omnipod
- Omnipod dash
- Cell Novo
- Freestyle Libre
- Dexcom G6
- Medtronic guardian 3
- Medtronic guardian 4
- Hybrid Closed Loop
- DIY Closed Loop

Themes



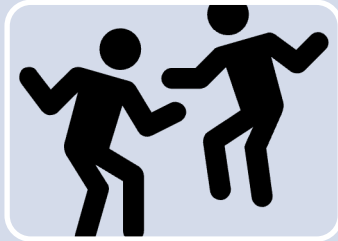
Theme 1

The impact of
T1D on
relationships



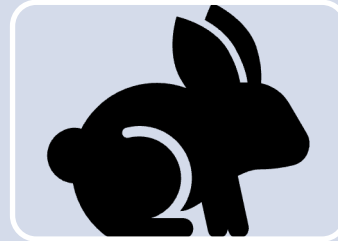
Theme 2

The impact of
T1D on sexual
activity



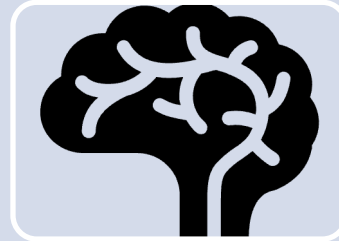
Theme 3

The impact of
wearable
diabetes
devices on
sexual partners



Theme 4

The impact of
wearable
diabetes
devices on
sexual activity



Theme 5
Strategies to
improve
knowledge



Theme 6
improvement
suggestion to
designers of
wearable
diabetes
technology

Summary of findings

- Establishing relationships
- Disclosing diabetes
- Committing to someone with a medical condition
- Constant reminder of having diabetes
- Concealing the condition
- Long-term vs short-term relationships
- Partner support
- Hypoglycaemia- more time in range = more sex
- Spontaneity



Summary of findings

- Devices are a turn off
- Scratchy cannulas
- Intrusive distraction
- Annoying alarms
- Device removal for sex, cgm, tethered, patch pump
- Lack of knowledge of what to do with it
- Dislodging devices
- Device placement



Summary of findings

A message for HCPs

- Leaflets/education days

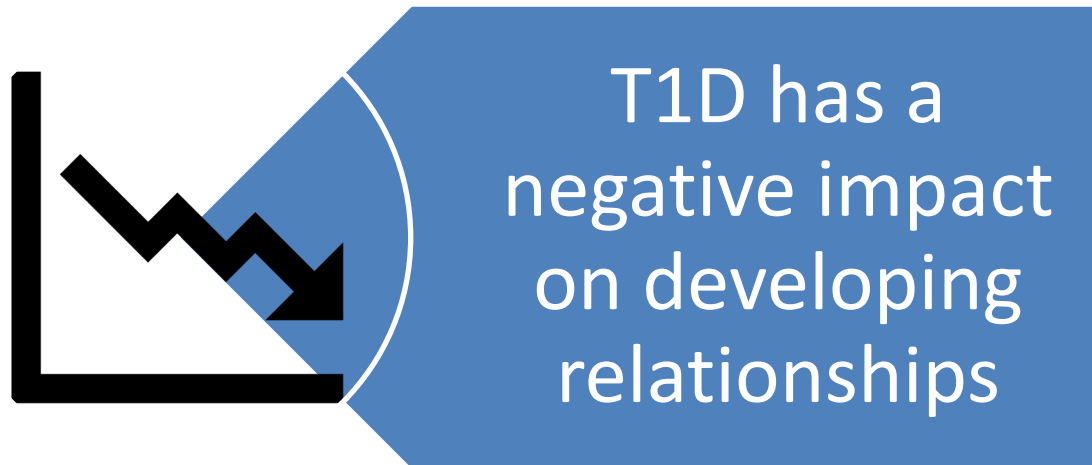
A message for designers

- Size matters
- Tubing
- Cannulas
- Alarms
- CGM



DISCUSSION

Developing relationships



That's all folks

- Hypoglycaemia and erectile dysfunction
- Hypoglycaemia and sexual dysfunction in women with T1D
- Technology reduces hypos
- Alarms allow proactive treatment





According to the daily mail which sex position burns the most calories?

The top 11 analysed positions for both partners combined

- 1. Standing – 343 calories burned, combined
- 2. Wheelbarrow – 316 calories burned, combined
- 3. Lotus– 287 calories burned, combined
- 4. Legs Akimbo– 264 calories burned, combined
- 5. Doggy – 260 calories burned, combined
- 6. Missionary (Hips Dipped) – 250 calories burned, combined
- 7. Squatting – 238 calories burned, combined
- 8. Missionary – 199 calories burned, combined
- 9. Cowgirl – 187 calories burned, combined
- 10. Reverse Cowgirl – 187 calories burned, combined
- 11. Spooning – 56 calories burned, combined

Ready, set, check glucose, eat food, wait a minute, go

Lack of spontaneity.

No participants had ever discussed how to manage sexual activity and diabetes with a HCP.

Sex is a significant part of life that should be discussed by HCPs during consultations.



Distraction

Managing diabetes means part of their brain is not focussed on sexual activity

Alarms can be quite intrusive

Disconnecting the device and not stopping the flow of insulin or wrapping it up in a towel so the noise of the alarm could not be heard.

This issue is unique to diabetes



Dislodgement of devices & Site Placement

- How to adapt their products to be more reliable during sexual activity
- Potential problem with site placement (mainly in the leg) during sexual activity that could be discussed with people who are starting devices

Let's talk about sex

Difficult to discuss this topic

This lack of sexual care planning with a long-term health condition has been shown in coronary artery disease care

HCPs need to create an environment that is supportive of these discussions around sexuality.



Strengths of study

Research on this topic area is limited

No previous UK based studies

Unique study

The researcher lives with T1D, may facilitate more open conversations with participants.

Limitations

There were no non-white volunteers in the study,

No young adults (aged 18-24) who volunteered.

Educated to degree and above

Diabetes duration for over 10 years

Summary & Recommendations

Added new information on the topic of wearable diabetes technology and sexual activity such as

- Alarms
- Hypoglycaemia,
- The importance of discussion on sexual activity by HCPs.
- Technology increased time in target glucose range this led to more sexual activity.
- Devices need to be smaller with more choice of cannulas/tubing

This research will allow

- HCPs awareness of the impacts to support and advise PWD on this topic.
- Perhaps develop a guideline/ frequently unasked questions
- Future product design to improve the experiences of wearers during sexual activity.

This research has identified further research avenues

- The same study in non-white, young adults, new diagnosis, lower education level or deprived communities
- The impact of hypoglycaemia on sexual function in women with T1D
- Device company research into better ways to give devices in place during sex

Acknowledgements

- I would like to acknowledge all the participants
- I would also like to give a big thank you to my research supervisor Haya who was always there when I needed her.
- Fend for sponsoring my MSc

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