



# **Study on the informational behavior of people with type 1 diabetes**

## **Key findings**

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Study on the informational behavior of people with type 1 diabetes, 1025 Participants  
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**Technology**  
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# Key findings

Systems for continuous glucose measurement are the central tool for type 1 diabetics.

The most important information is the current value, followed by the trend arrow and the curve.

Currently, there is no optimal app.

An optimal app should be independent, comprehensive, and customizable.

Type 1 diabetics who are active in sports assess their metabolic status more positively.

Diabetologists play an important role in diabetes management.

Type 1 diabetics who consider themselves stable adapt their diet more.

Carbohydrates are predominantly valued based on experience.

Diabetes should take as little time as possible.

Systems for continuous glucose measurement are the central tool for type 1 diabetics.

- 94.2% of type 1 diabetics use a CGM system.
- More than one in two (59.9%) carries an insulin pump.
- 5% only use a blood glucose meter.
- Among the pump carriers, almost half use a hybrid loop system.
- Users of insulin pens find it harder to know how much insulin is active in the body.

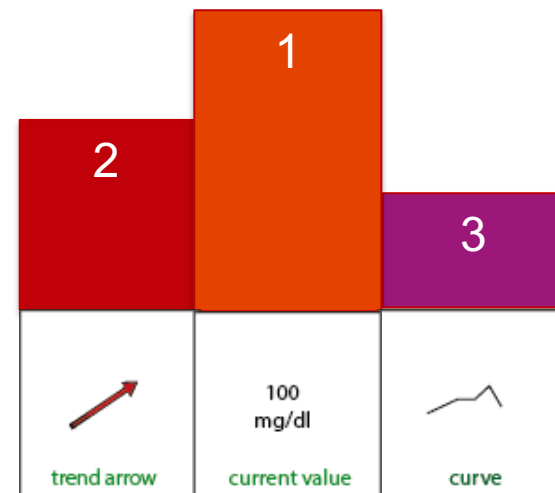
Technical aids used

	Frequency	Percent
Glucose	730	71,2
Insulin pens	479	46,7
Insulin pump	614	59,9
CGM System	966	94,2



The most important information is the current value, followed by the trend arrow and the curve.

- The current value is the most important information, 67.5% have put it in 1st place.
- Where the value develops is the second most important information.
- Pump carriers prioritize the value "insulin in the body" higher than pen users.
- The information "time in the target area" is important, but is rather used for subsequent control.



4th place: Insulin on board

5th place: Time in range

6th place: HbA1c

Currently, there is no optimal app.

- Only 2.2% are satisfied with their current app, i.e. many type 1 diabetics are dissatisfied with their apps.
- Apps are very important for diabetes management. Only 8.5% do not use an app.
- Most diabetics use 1 to 4 apps for diabetes management. A quarter uses 2 apps.
- The use of several apps inevitably leads to spending more time with diabetes, which is not desired. Almost 30% fully agree.

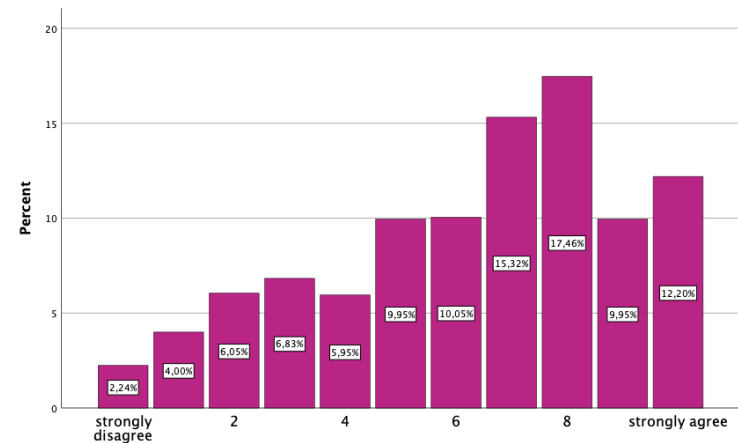
Original comments from the survey:

"All in one app with sport, bolus calculator, KH calculation and database, and remote control"

"That even more products interact with each other"





"Apps where complex information can be captured in a simple way would be helpful."

For diabetics, there is currently not the optimal app.



An optimal app should be independent, comprehensive, and customizable.

- The question of whether an app is desired that can be adapted to one's own needs in the presentation and evaluation is to be answered with yes.
- Type 1 diabetics want an app that combines blood sugar, carbohydrates, insulin in the body and, for example, weight, blood pressure and fitness (sports). One in three fully agrees with this wish.
- The desire for a manufacturer-independent app that makes it easier to change providers is also at the top of the wish list.
- An app that gives tips and hints based on one's own values is often desired.

Wishes		Average	SD*
App Customizable		7,69	2,16
App Integration		7,64	2,75
App Independently		7,38	2,44
App Hints		7,29	2,30

\* SD = Standard deviation



## An optimal app should be independent, comprehensive, and customizable.

Original comments from the survey:

"Open devices, i.e. devices that can really be used across manufacturers and can be integrated with the mobile phone such as CGM, pump, measuring device not only by reverse engineering"

" An app or software that analyzes the values and data from all devices simultaneously in such a long-term way that influences of the cycle can be recognized and can also support more predictions for movement by analyzing the values and insulin quantities during movement (also different types of movement) "

" An app that can evaluate different life situations. For example, the effects of the cycle or an illness (flu) or the weather (very hot summer) on diabetes and then possibly Reminds / gives hints / makes suggestions on the basis of courses from the past. Quasi the evaluation of all available data to draw conclusions (For example: Last year in midsummer you needed twice the amount of insulin at these temperatures of 40 degrees. / Last month at this time of your cycle you needed half of basal insulin for 3 days) "

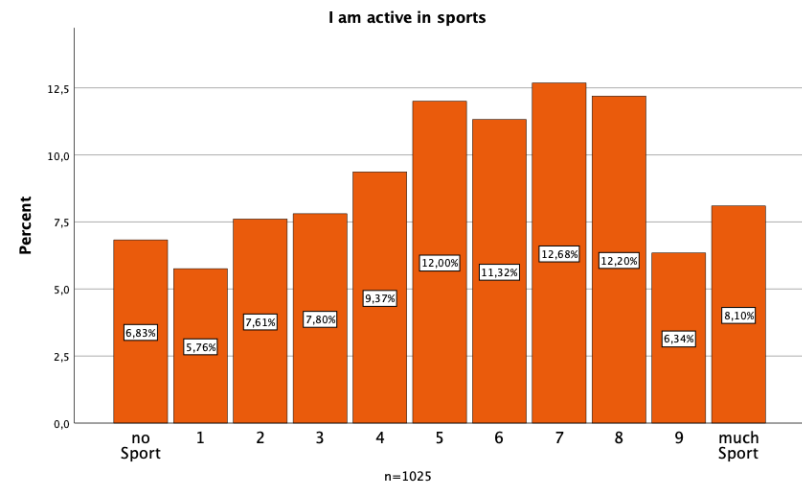
" Free access to the own FC data from the CGMS sensors via an API of the respective manufacturer. This would have to be regulated analogously, such as the right to access bank data via third-party apps (regardless of the bank providing the data). "

"ONE! STABLE! App for controlling, documenting and evaluating my diabetes and my nutrition, exercise and health data. It may also work so well that I may no longer have to announce meals and exercise. "

" More compatibility between manufacturers' devices and apps "

## Type 1 diabetics who are active in sports assess their metabolic status more positively.



- Only 6.83% of type 1 diabetics say they do not exercise at all. Compared to the total population, this is a very good result.
- With increasing sporting activity, the assessment of the quality of the personal metabolic situation also increases.
- Type 1 diabetics who exercise a lot will inevitably need multiple apps because there is no app that connects diabetes and exercise.
- While some use exercise to lower blood sugar, others pursue other goals with exercise.

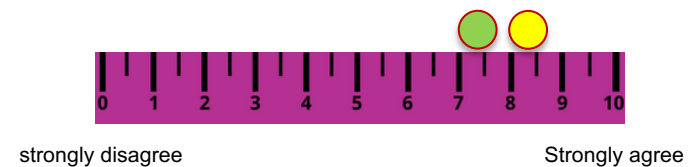




## Diabetologists play an important role in diabetes management.

- Quarterly visits to the diabetologist are important and provide important information. 30.8% of type 1 diabetics fully agree with this statement.
- Diabetics talk openly about their disease and the current situation with their diabetologist. 37.9% fully agree.

Wishes		Average	SD*
Importance of visits to the diabetologist		7,43	2,78
Open discussions		8,27	2,75



\* SD = Standard deviation

## Type 1 diabetics who consider themselves stable adapt their diet more.

- When dealing with nutrition, there is no uniform picture for diabetics. Some adapt their diet to the diabetes and others do not.
- Who adjusts his diet, is
  - much more active in sports,
  - uses "time in range" more to control diabetes,
  - assesses one's own current metabolic situation more positively.

Correlations according to Pearson

		Adjust your diet
Metabolic status	Pearson correlation	,106**
	Sig. (2-sided)	<,001
	N	1025
Sporting activity	Pearson correlation	,226**
	Sig. (2-sided)	<,001
	N	1025
TIR Use	Pearson correlation	,127**
	Sig. (2-sided)	<,001
	N	1025

\*\* . The correlation is significant at the level of 0.01 (2-sided).



## Carbohydrates are predominantly valued based on experience.

- Type 1 diabetics predominantly value carbohydrates based on experience.
- Less than 2% of type 1 diabetics disagree.
- The recording and estimation of carbohydrates could be significantly improved, which is very clear from the comments.

### Original comments from the survey:

"Better carbohydrate aids in the apps."

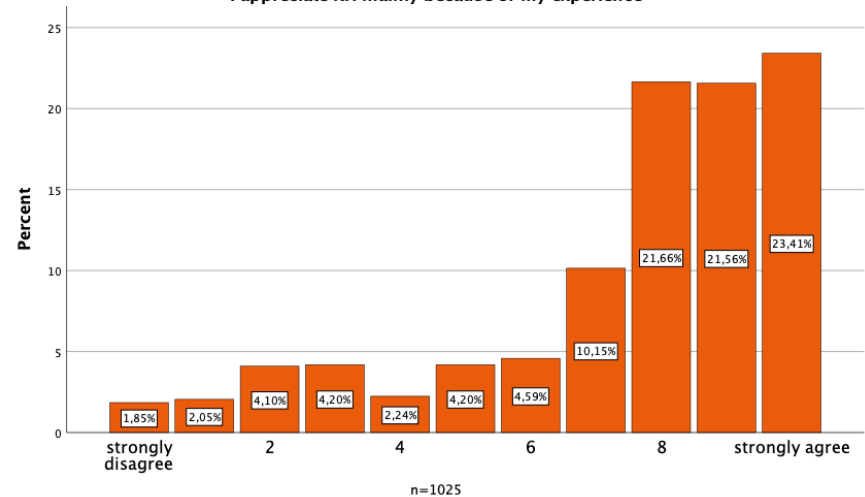
"Kh calculator based on recipes"

"Identify features as easily as possible and document them in an app"

" I want books or apps that make it easier to read or calculate ne/be "

"App that can reliably determine the BE based on a photo"

I appreciate KH mainly because of my experience



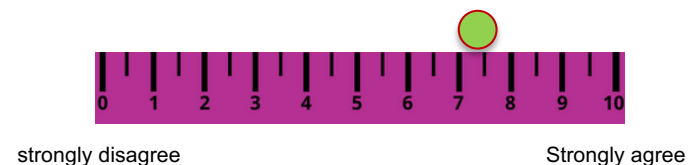
## Diabetes should take as little time as possible.

- In order to be able to lead as "normal a life" as possible, the time spent dealing with apps for diabetes should be minimized. Almost 30% "fully agree" with this statement.
- As previously reported, most type 1 diabetics are dissatisfied with their app.
- Almost half of type 1 diabetics use three or more apps for their management, which takes time.

Original comments from the survey:

"Digitalization that doesn't take much time...."

"The less I think about what could be better, the more time I have for the beautiful things."



## Conclusion and outlook

- The large number of 1,025 study participants shows that people with type 1 diabetes are very willing to report on their situation.
- Over 90% already use a CGM system and more than one in two wears an insulin pump. So far, little is known about the experience with this.
- Apps play an important role in diabetes therapy. The current situation is considered by the participants to be in need of improvement.
- Glucose levels, insulin, diet and exercise should be combined in one app.
- Apps should be customizable according to individual wishes.
- There is a desire for a manufacturer-independent app.
- In the future, studies that give insight into the daily life of people with type 1 diabetes should be conducted more frequently.

# Study profile

<b>Method:</b>	Online survey
<b>Survey period:</b>	01.10. bis 15.11. 2022
<b>Number of participants:</b>	1712
<b>Completed questionnaires:</b>	1048
<b>Analyzed Questionnaires:</b>	1025
<b>Average duration of participation:</b>	5 Minutes und 32 Seconds
<b>Population:</b>	ca. 340.000 Adults
<b>Recruitment:</b>	Self-selection
<b>Questionnaire scope:</b>	25 Items
<b>Evaluation:</b>	SPSS

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