

# Anticipated reduction in hypoglycaemia fear and diabetes distress from increasing the glucose prediction of current CGM algorithms

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## BACKGROUND & AIMS

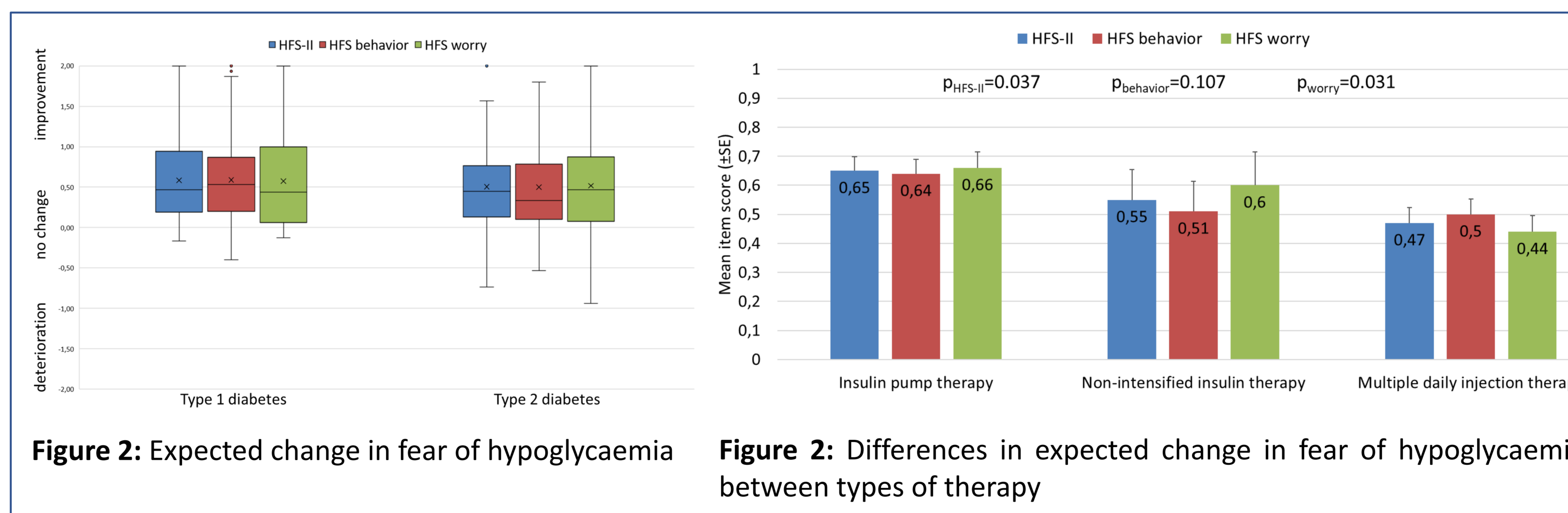
- Hypoglycaemia remains the limiting factor of insulin therapy.
- People with diabetes often have increased fear of hypoglycaemia and distress due to hypoglycaemia.
- Continuous glucose monitoring (CGM) is a powerful tool to alleviate these fears and burden.
- However, current CGM algorithms only allow a prediction of glucose values within the next 15-30 minutes, making glucose management rather unpredictable.
- To elaborate on the potential to improve current CGM systems, we investigated if a possible increase in this prediction window to up to 2 hours would be perceived as a significant benefit with regard to hypoglycaemia fear and diabetes distress.

## MATERIALS & METHODS

- People with type 1 and type 2 diabetes who were currently using a CGM system were invited to participate in an online survey from the dia-link online panel.
- Participants were presented with scenarios depicting the potential of a hypothetical CGM algorithm to predict the course of glucose for up to 2 hours.
- They were instructed to imagine how such a long-term prediction would affect their personal diabetes management.
- Participants were asked to complete the Hypoglycemia Fear Survey (HFS-II) and T1-Diabetes Distress Scale (T1-DDS) and rate each item in terms of the potential expected change by using such a long-term glucose prediction
  - 2 strong deterioration
  - 1 deterioration
  - 0 no change
  - 1 improvement
  - 2 strong improvement

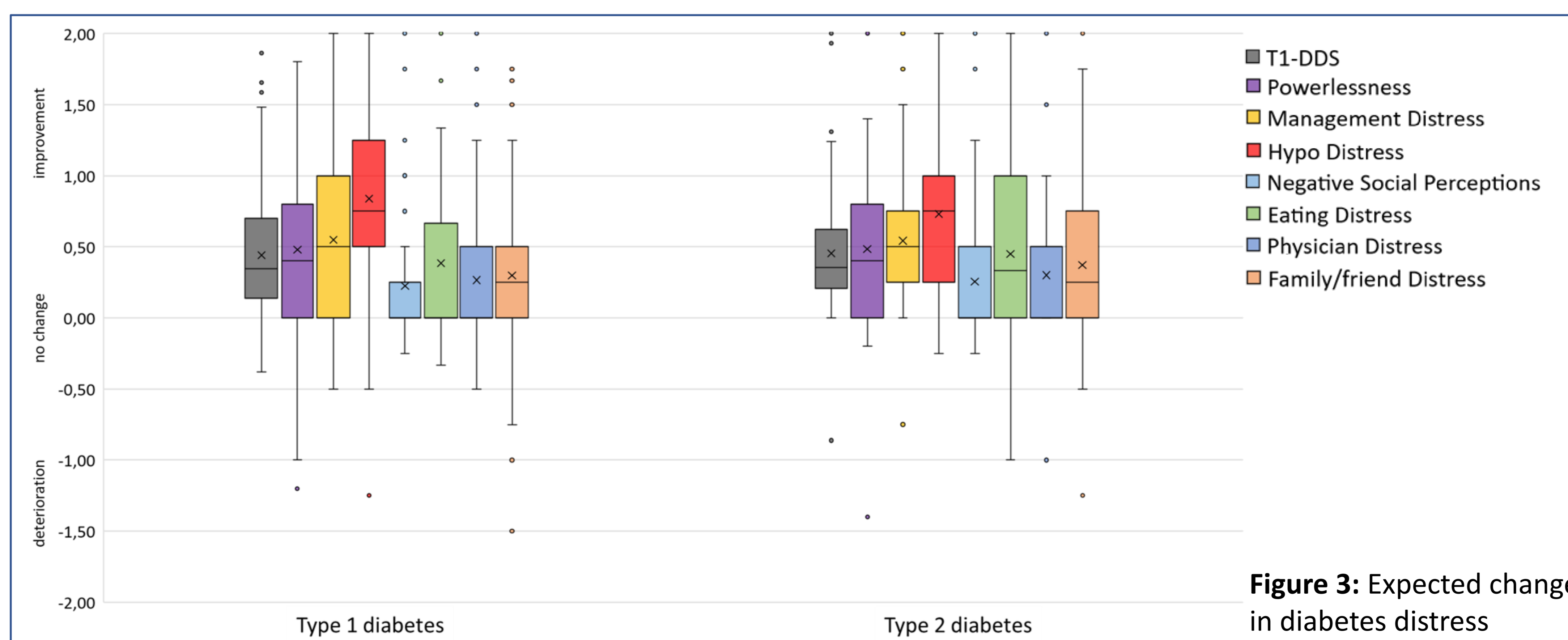
M (SD)/n (%)	Type 1 diabetes	Type 2 diabetes
<b>N</b>	146 (70.9%)	60 (29.1%)
<b>Age (years)</b>	53.8 (13.7)	64.9 (9.3)
<b>Sex</b>	82 (56.2%) female	13 (21.7%) female
<b>BMI (kg/m<sup>2</sup>)</b>	26.9 (4.7)	31.6 (6.2)
<b>Duration of diabetes (years)</b>	26.4 (15.9)	18.1 (10.1)
<b>HbA1c (%)</b>	6.9 (0.8)	7.2 (1.2)
<b>Type of therapy</b>		
- Non-intensified insulin therapy	- 0 (0%)	- 17 (28.3%)
- Multiple daily insulin injection	- 45 (30.8%)	- 40 (66.7%)
- Insulin pump therapy	- 101 (69.2%)	- 3 (5.0%)
<b>% 70-180 mg/dl (3.9-10 mmol/l)</b>	72.1%	74.3%
<b>% &lt; 70mg/dl (3.9 mmol/l)</b>	4.4%	3.3%
<b>% &gt; 180 mg/dl (10 mmol/l)</b>	23.5%	22.4%
<b>CGM-systems</b>		
FreeStyle Libre 2	41 (29.3%)	27 (45.0%)
FreeStyle Libre 3	24 (17.1%)	25 (42.4%)
Dexcom G6	53 (37.9%)	7 (11.9%)
Medtronic Guardian	19 (13.6%)	0 (0%)
Other	3 (2.1%)	0 (0%)

**Table 1:** Sample characteristics



**Figure 2:** Expected change in fear of hypoglycaemia

**Figure 2:** Differences in expected change in fear of hypoglycaemia between types of therapy



**Figure 3:** Expected change in diabetes distress

## RESULTS

### Sample characteristics (Table 1):

- A total of 206 people with diabetes participated (29.1% type 2 diabetes; type 1: age 53.8±13.7 years, 56.2% female, HbA1c 6.9±0.8%; type 2: age 64.9±9.3 years, 21.7% female, HbA1c 7.2±1.2%).

### Expected improvement in fear of hypoglycaemia:

- Participants expected moderate improvements in HFS-II scores (0.57±0.49; Figure 2).
- People with insulin pump therapy showed greatest expected improvements in hypoglycaemia fear (0.65±0.48), followed by non-intensified insulin therapy (0.55±0.49) and multiple daily injection therapy (0.47±0.49) (p = 0.037; Figure 2).

### Expected improvement in diabetes distress:

- Participants expected moderate improvement in overall diabetes distress (0.44±0.49).
- Greatest improvement were expected in hypoglycaemia distress (0.81±0.60).
- Figure 3 depicts improvement for the subscales of the T1-DDS.
- Anticipated improvements in diabetes distress did not differ for type of therapy (all p>0.10) or type of diabetes (p = 0.252).

## CONCLUSION

- Increasing the glucose prediction to up to 2 hours would be seen as a potential improvement regarding reductions in fear of hypoglycaemia and hypoglycaemia distress and by both people with type 1 and type 2 diabetes.
- Interestingly, people with insulin pump therapy anticipated the greatest effect of such a long-term prediction regarding fear of hypoglycaemia.

## CONTACT

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