# Psychosocial Impact of Severe Hypoglycemia and Perceptions of Nasal Glucagon in Young Adults with Type 1 Diabetes

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## OBJECTIVES

- To understand emerging adults' perceived impact of a SHE (in general) and NG on their engagement in social activities and distress, and to better understand emerging adults' perceptions of preparedness and protection with NG.

## BACKGROUND

- Emerging adulthood for people with type 1 diabetes (T1D) is a period marked by changes in both daily life and diabetes management that present challenges and distress.[1,2]
- Worrying about severe hypoglycemia (SH) during emerging adulthood may affect behaviors,[3] while the psychosocial impact on social lives or distress in emerging adults from a potential severe hypoglycemic event (SHE) is unclear.
- Nasal glucagon (NG) may help alleviate perceived psychosocial impact of potential SH and be associated with greater perceptions of preparedness and protection.[4,5]

## STUDY DESIGN

### Methods

- Emerging adults (aged 18–26 years) diagnosed with T1D for ≥12 months and who had received a prescription for NG from their healthcare provider were invited to participate in an online study.
- Participants were recruited from the College Diabetes Network, Children with Diabetes, and the T1D Exchange Online Registry.
- Participants completed an online survey that assessed:
  - Sociodemographic characteristics and diabetes history
  - Psychosocial experiences (informed by previous qualitative work with caregivers,[6] i.e., engagement in social activities; distress; etc.) in the context of a potential SHE, from "strongly disagree" to "strongly agree"
  - Perceived impact of NG on psychosocial experiences (i.e., engagement in social activities; distress) from "worsened a great deal" to "improved a great deal"
- Participants completed the Prepared and Protected subscale of the Glucagon Device Attitudes questionnaire, a validated scale to assess preferences with and attitudes about glucagon devices.[5]

### Analyses

- Descriptive analyses were used to describe participants' psychosocial experiences of SH and the perceived impact of NG.
- A composite score of the Prepared and Protected items was calculated per the scale instructions and experiences of preparedness and protection with NG and the emergency glucagon kit requiring reconstitution were compared within-person using a Wilcoxon signed rank test.

## KEY RESULTS

**Greater positive perceptions[1] of preparedness and protection with NG were reported than with the emergency glucagon kit that requires reconstitution.**

**Table 1**

| Prepared and Protected Composite and Subscale Items | Nasal glucagon Q1 \| median \| Q3 | Emergency glucagon kit Q1 \| median \| Q3 |
|---|---|---|
| Composite score: Prepared and Protected Subscale… | 5.1 \| **5.9** \| 6.3 | 3.0 \| **4.0** \| 4.9 |
| -How confident would you be that you got the full dose of… | 4.0 \| **5.0** \| 6.0 | 3.0 \| **5.0** \| 6.0 |
| -How secure would you feel having with you … | 5.0 \| **6.0** \| 6.0 | 3.0 \| **4.0** \| 5.0 |
| -How comfortable would you be for your family member/friend to use … | 5.0 \| **6.0** \| 7.0 | 2.0 \| **3.0** \| 4.0 |
| -How convenient do you think it would be to use … | 5.0 \| **6.0** \| 7.0 | 2.0 \| **3.0** \| 4.0 |
| -How prepared and protected would you feel having it with you… | 5.0 \| **6.0** \| 6.0 | 3.0 \| **4.0** \| 5.0 |
| -In a rescue situation, how likely is your family member/friend able to correctly use … | 5.0 \| **6.0** \| 7.0 | 3.0 \| **5.0** \| 5.0 |
| -How likely are you to feel safe having it with you … | 5.0 \| **6.0** \| 7.0 | 3.0 \| **5.0** \| 6.0 |

[1]Wilcoxon signed rank test revealed a significant difference ($p < 0.001$), in the median composite score for NG (5.9) compared to emergency glucagon kit (4.0).
Q1, quartile 1; Q3, quartile 3

## CONCLUSIONS

- The majority of emerging adults in our sample perceived treating a 'severe low' as distressing, while the possibility of having a 'severe low' limiting social activities varied across individuals.
- For emerging adults with T1D, NG appears to provide meaningful psychosocial benefits for navigating a difficult aspect of diabetes management – the potential for SHEs.
- Emerging adults reported greater positive perceptions of preparedness and protection with NG compared to the emergency glucagon kit requiring reconstitution.
- Emerging adults perceived a positive impact with NG on their freedom to engage in social activities and in alleviating distress.

## STUDY LIMITATIONS

- Participants had high diabetes technology use, were predominantly non-Hispanic white, and were highly motivated to participate in research; thus, results may not generalize to the overall population of emerging adults with T1D.

## Baseline Characteristics

**Table 2**

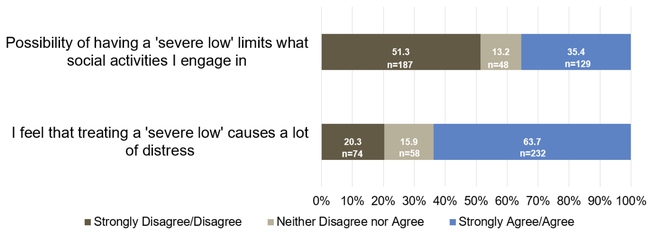
| | T1D N=364 |
|---|---|
| Age, years, mean [SD] | 21.6 [2.3] |
| Gender, female, n (%) | 268 (73.6) |
| Race, white, n (%) | 340 (93.4) |
| Ethnicity, not Hispanic or Latino, n (%) | 323 (88.7) |
| Primary residence, n (%) | |
| Apartment/house with roommates | 115 (31.6) |
| College dorm | 85 (23.4) |
| Parent's/family's home | 82 (22.5) |
| Apartment/house with romantic partner | 54 (14.8) |
| Apartment/house by myself | 26 (7.1) |
| Other (e.g., friend or grandparent) | 2 (0.5) |
| Most recent, self-reported HbA1c, mean [SD] | 7.1 [1.2] |
| SHEs experienced in past 12 months, mean [SD] | 1.7 [5.2] |
| Respondents treated with nasal glucagon, n (%) | 34 (9.3) |

HbA1c, glycated hemoglobin; SD, standard deviation; SHEs, severe hypoglycemic events; T1D, type 1 diabetes.

## Psychosocial Impact

**Figure 1**

Roughly one-third of participants (35.4%) agreed/strongly agreed that possible SHEs limited their engagement in social activities. Most participants (63.7%) agreed/strongly agreed that treating a SHE* was distressing.

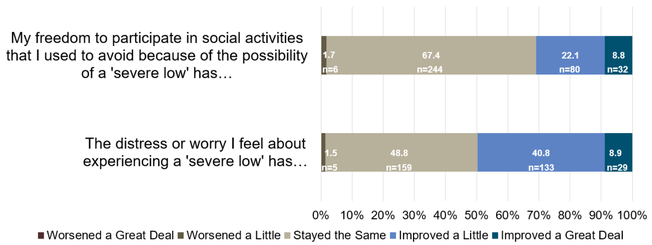



*SHE, severe hypoglycemic event.

## Impact on Social Activities and Distress Levels After Obtaining Nasal Glucagon

**Figure 2**

Since having NG, 30.9% of participants reported improved freedom to engage in social activities and 49.7% reported reduced distress.




Only participants who reported "a little bit" or more distress about hypoglycemia were asked about change in their distress levels. 0% of participants reported 'worsened a great deal' for both questions. NG, nasal glucagon.

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