

# Fear of self-injecting and self-testing and the related risk factors in adolescents with type 1 diabetes: a cross-sectional study

Dr. Khuloud Almonea

Department of Endocrinology and Diabetes, Diabetes Treatment Center, Prince Sultan Military Medical City, Riyadh, Saudi Arabia.



## Objective

This study was conducted to investigate the fear of self-injecting and self-testing and its related risk factors among adolescents with type 1 diabetes mellitus (T1DM)

## Methods

From December 2015 to April 2016, a cross-sectional study was performed at the Diabetes Treatment Center, Prince Sultan Military Medical City (PSMMC), Riyadh, Saudi Arabia on 142 registered T1DM patients between 13 and 19 years of age. Selection of the respondents was done deliberately and carefully, and the suitable patients were given specific identification numbers. A trained interviewer administered the short Diabetes Fear of Injecting and Self-testing Questionnaire (D-FISQ) to each patient. It included two subscales estimating the fear of self-injection (FSI) and fear of self-testing (FST). Each patient's age, gender, weight, height, adjusted body mass index (BMI), duration of the diabetic condition, treatment modality, insulin dosage and glycosylated hemoglobin (HbA1c) were recorded.

### Statistical analysis

Data analysis was done with Microsoft Excel 2010, Microsoft Corporation, Seattle, WA, USA and the Statistical Package for Social Sciences version 16 SPSS Inc., Chicago, IL, USA. Equal variances across the groups were performed employing the Kolmogorov-Smirnov test. Besides the descriptive analysis, "t" test and Multiple Linear Regression Analysis were done to identify the differences among the groups. The p-value of <0.05 was accepted as statistically significant.

## Results

**Table 1: Demographic variables of the study population**

Variable(s)	Frequencies (n)	%
<b>Gender</b>		
Male	76	53.5
Female	66	46.5
<b>Age (yrs.)</b>		
13-16 yrs.	83	58.5
17-19 yrs.	59	41.5
<b>Body mass index</b>		
Underweight	18	12.7
Normal	94	66.1
Overweight	16	11.3
Obese	14	9.9
<b>Duration of Diabetes Mellitus (yrs.)</b>		
≤ 5 years	50	35.2
>5 years	92	64.8
<b>Treatment Modality</b>		
Multiple daily insulin	103	72.5
Insulin pump	39	27.5
<b>HbA1c (%)</b>		
≤7	38	26.8
>7	104	73.2
<b>Dose of insulin (units per kg)</b>		
≤0.7	19	13.4
>0.7	123	86.6

**Table 2: Variables associated with diabetes fear of injecting and self-testing**

Variable (s)	Fear of self-injection of insulin	Fear of self-testing of blood glucose
<b>Gender</b>		
Male	2.21±1.1	2.33±1.01
Female	2.29±0.991	2.53±0.916
<b>Age (years)</b>		
13-16 yrs.	2.02±1.01	2.31±1.04
17-19 yrs.	2.58±1*	2.61±0.81
<b>BMI</b>		
Underweight	2.18±0.96	2.19±0.84
Normal	2.42±0.98	2.08±0.98
Overweight	2.61±0.87	2.25±1.23
Obese	2.50±1.24	2.54±1.13
<b>Duration of Diabetes Mellitus (yrs.)</b>		
≤ 5 years	2.04±0.96	2.04±1
>5 years	2.37±1.06	2.65±0.87*
<b>Treatment Modality</b>		
Multiple daily insulin	2.62±0.96*	2.69±0.99*
Insulin pump	1.28±0.45	1.77±0.42
<b>HbA1c (%)</b>		
≤7	1.55±0.555	1.26±0.50
>7	2.76±0.876*	2.62±0.948*
<b>Dose of insulin (units per kg)</b>		
≤0.7	1.32±0.582	1.53±0.612
>0.7	2.40±1.02*	2.58±0.932*
<b>Average number of finger pricks per day</b>		
One	2.72±1.22	3.11±1.32
Two	3.12±0.633*	2.79±0.645*
Three	2.12±0.844*#f	2.76±0.78*
Four	1.52±0.667*#f	1.76±0.614*#f
Five	1.20±0.414*#f	1.40±0.507*#f

Groups compared by "t" test and one way analysis of variance.  
Average number of finger pricks comparisons: \*1 vs 2,3,4,5. #2vs 3,4,5. f 3 vs 4,5.

**Table 3: Results of multiple linear regression analysis (fear of self-injection of insulin)**

Variable	Fear of self-injection of insulin				
	β coefficient	95% Confidence Interval		t value	p value
		Lower	Upper		
Age	.348	.149	.547	3.46	0.001
Treatment modality	-.667	-.923	-.412	-5.17	0.001
Average number of finger pricks	-.506	-.609	-.402	-9.67	0.001
Hemoglobin A1c (%)	.213	-.083	.508	1.42	.157
Dose of insulin (units/kg)	-.220	-.554	.115	-1.30	.197

**Table 4: Results of multiple linear regression analysis (fear of self-testing of blood glucose)**

Variable	Fear of self-testing of blood glucose				
	β coefficient	95% Confidence Interval		t value	p value
		Lower	Upper		
Diabetes duration	.197	-.028	.421	1.7	0.85
Treatment modality	-.155	-.429	.118	-1.1	.263
Average number of finger pricks	-.507	-.621	-.393	-8.8	0.00
Hemoglobin A1c (%)	.224	-.093	.540	1.4	.164
Dose of insulin (units/kg)	1.13	-.361	.360	-231	.998

## Conclusion

- ❖ It is quite common among children with T1DM to have a fear of needles.
- ❖ However, although it is frequently missed, the current study has revealed the remarkable impact the fear of needles exerts on type 1 diabetes.
- ❖ This study identified some significant risk factors for fear of needles, as follows: age, duration of diabetes and treatment modality, besides glycemic control, insulin dosage and number of finger pricks on average.
- ❖ Although the needles used today, for SMBG and insulin injections are much finer than those of earlier times, the fear of using needles and pain may continue to be encountered and thus lead to a lowered compliance with SMBG and self-injection of insulin.
- ❖ Health care providers, diabetic educators in particular, need to necessarily consider these factors when discussing SMBG with children diagnosed with diabetes and their caregivers.
- ❖ The diabetes educationist should be trained to employ techniques to reduce the pain during finger prick, for example, by pricking the lateral aspect of the finger, avoiding pricking the thumbs and index fingers or pricking to shallower needle depths; besides, they could be advised to utilize alternative testing sites, like the arm, abdomen, and thigh to rest the fingers for some length of time.

## References

- Mollema ED, Snoek FJ, Pouwer F, Heine RJ, van der Ploeg HM. Diabetes Fear of Injecting and Self-Testing Questionnaire: a psychometric evaluation. *Diabetes care.* 2000;23(6):765-9.
- Peyrot M, Rubin RR, Kruger DF, Travis LB. Correlates of insulin injection omission. *Diabetes care.* 2010;33:240-5.
- Scorpiglione N, el-Shazly M, Abdel-Fattah M, et al. Epidemiology and determinants of blood glucose self-monitoring in clinical practice. *Diabetes Res Clin Pract.* 1996;34:115-25.