

## **Ethnic disparities in people accessing Free-Style Libre in the United Kingdom: Insights from the Association of British Clinical Diabetologists audit**

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Flash glucose monitoring with the FreeStyle Libre (FSL) has gained increasing popularity in the management of diabetes over the past few years. Intermittently scanned continuous glucose monitoring (isCGM) devices such as the FreeStyle Libre have been shown to improve glycaemic control, hypoglycaemia awareness, and resource utilisation in people living with diabetes<sup>1-3</sup>. The recent NICE guidelines recommend the use of isCGM for people with diabetes in the United Kingdom, which has the potential to significantly improve the quality of life and health-related outcomes in people with diabetes. However, there is a clear demonstration of ethnic inequalities in diabetes care and outcomes in people living with diabetes in the UK<sup>4</sup>.

Extensive literature shows that ethnic inequalities in outcomes among people living with diabetes are widespread<sup>5-13</sup>. However, there is a lack of data on the determinants of the disparities in outcomes. There are also no data looking at equity in access to newer diabetes technologies and if there are any ethnicity-specific differences in people who have accessed this technology. This gap in knowledge is essential to understand how the introduction of new technologies affects different ethnic groups and to address the potential for inequity in access to these technologies. Therefore, this study aimed to understand the ethnicity-specific differences in people living with diabetes in the UK who access isCGM

This observational study analysed data collated from the nationwide ABCD audit on FreeStyle Libre that started in November 2017. The study consisted of 13,698 people living with diabetes, with a median age of 40 (25-54) years, and 40% of them being female. The study population comprised Caucasians (White, Irish and any other Caucasian background), Afro-Caribbean (African and Caribbean) and Bangladeshi, Indian and Pakistani (BIP) Origin. The study participants wore the FSL device for 14 days, and their interstitial glucose levels were measured intermittently. The data collected included patient demographics, previous completion of structured diabetes education, duration of diabetes, Body Mass Index (BMI), HbA1c values from the previous 12 months, Gold score, Diabetes Distress Screening scale (DDS2)<sup>14</sup> in the previous 12 months.

The results of the study showed significant differences in the baseline demographic and clinical characteristics of the study population across the three ethnic groups who accessed flash glucose monitoring (Table1). The Afro-Caribbean population with diabetes had a significantly lower age and duration of diabetes compared to the White and BIP populations. The Afro-Caribbean population with diabetes also had a statistically significantly higher HbA1c at baseline compared to the White and BIP populations (P-value= 0.002). In addition, the prevalence of diabetes-related distress was significantly higher in the Afro-Caribbean population than in the Caucasian and BIP populations (P-value=0.007). The study also show that Afro-Caribbean population and BIP population were more likely to require completion of structured education prior to the initiation of isCGM.

The study findings have implications for the management of diabetes and the use of isCGM devices such as the FSL in different ethnic populations. The study has highlighted that ethnic differences may play a role in the access to new diabetes technologies, and that Afro-Caribbean populations with diabetes may have higher rates of diabetes-related distress. The study also highlights the need for further research into the determinants of the disparities in outcomes among different ethnic populations living with diabetes.

The study has some limitations. The study participants only included three ethnic groups, and there were only 11 participants who identified as Asian ethnicity, and these were not included in the analysis. The study also only looked at the use of FSL in people living with diabetes and did not explore the use of other diabetes technologies. Furthermore, the study did not account for differences in socioeconomic status, which may have affected access to diabetes technologies and diabetes-related distress. In conclusion, the study provides evidence for ethnicity specific differences in people with diabetes who access to isCGM technologies such as the FSL.

Table 1: Comparison of the baseline and clinical characteristics of the study population across the three ethnic groups

	Caucasian (n=13,112)	Afro-Caribbean (n=113)	BIP (n=473)	P- value*
Age	40.2 (±18.6)	32.9 (±16.0)	34.5 (±15.2)	<b>&lt;0.001</b>
Gender (% Female)	49%	60%	49%	0.08
BMI (mean ± SD)	25.7 (±6.4)	26.2 (±7.1)	25.2 (±6.0)	0.21
Duration of Diabetes (mean ± SD)	20.4 (±44.1)	10.9 (±9.2)	14.8 (±11.4)	<b>0.001</b>
Pre-FSL HbA1c (mean ± SD)	70.5 (±18.7)	76.6 (±22.2)	70 (±16.8)	<b>0.002</b>
Diabetes-related Distress (mean ± SD)	2.9 (±1.3)	3.3 (±1.4)	2.9 (±1.3)	<b>0.007</b>
Gold Score (mean ± SD)	2.7 (±1.7)	2.6 (±1.7)	2.6 (±1.7)	0.57
Severe Hypoglycaemia (mean ± SD)	2.1 (±21.8)	4.2 (±15.2)	2.5 (±12.0)	0.75
Structured Education (DAFNE) (% completed)	27%	35%	31%	<b>0.01</b>

P-value from Kruskal Wallis test

### Author contributions

HD and KA did the statistical analysis. H.D drafted and reviewed the manuscript. ES EW NJ BP RG AK AL PC DB JP CW REJ TS, gave constructive feedback and revised the manuscript ES EW NJ BP RG AK AL PC DB JP CW REJ TS reviewed and approved the manuscript. T.S provided overall supervision of the project. T.S, E.G.W, R.E.J.R, J.P, C.W conceived the nationwide FreeStyle Libre ABCD audit.

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### Conflicts of interest

The ABCD nationwide FSL audit is supported by a grant from Abbott Laboratories. E.G.W. serves on the advisory panel for Abbott Diabetes Care, Dexcom, and Eli Lilly and Medtronic; has received research support from Diabetes UK; and is on the speakers bureau for Abbott Diabetes Care, Dexcom, Eli Lilly and Medtronic, Insulet Corporation, Novo Nordisk, and Sanofi. C.W. has a spouse/partner serving on the advisory panel for Celgene and on the speakers bureau for LEO Pharma and Novartis. R.E.J.R. serves on the advisory panel for Novo Nordisk A/S and on the speakers bureau for BioQuest. T.S. is on the speakers bureau for NovoNordisk Foundation and reports a relationship with Bristol-Myers Squibb, Eli Lilly and Company, and Sanofi. H.D is partly funded through the NIHR academic programme. No other potential conflicts of interest relevant to this article were reported. The FSL audit was independently initiated and performed by ABCD, and the authors remain independent in the analysis and preparation of this report.

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