

My Blood Glucose Level Data for Detecting and Monitoring Type 2 Diabetes in Adult People

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Abstract: The data note shares the blood sugar level data stored in a depository and makes it findable, accessible, interoperable, and reusable to researchers who are interested in modelling Type 2 diabetes data. The researcher collected quantitative data at 8am for the selected 45 days using an SD Code free Blood Sugar Meter from 23 October 2020 to 20 May 2022, a total of 574 days. The blood sugar levels were measured in millimoles of sugar per litre (*mmol/L*). The research also analysed the 5 data points that were recorded during the diagnosis of Type 2 diabetes on 28 September 2018 at Mutare Health Gate pharmacy in Zimbabwe. The benchmarks used were 5.0 – 7.2 *mmol/L* before meals, less than 10 *mmol/L* after 1 – 2 hours of meals, and 5.0 – 8.3 at bedtime. The findings from the data show that the designed data analysis template detected the absence of Type 2 diabetes in the researcher's blood. The average and the standard deviation of the blood sugar level data are 5.964 *mmol/L* and 0.5335 *mmol/L* respectively. The maximum and minimum data points are 4.6 *mmol/L* and 7.0 *mmol/L* respectively. One lesson from the findings is that Type 2 diabetes can be managed to complete remission if the patient is assisted by health specialists such as pharmacists, family doctors, diabetologists, and dieticians. The findings from the blood sugar level data led to the suggestion of tips and hints on how to manage Type 2 diabetes in adults.

Keywords: Type 2 diabetes, Blood Sugar Level Data, millimoles of sugar per litre, Health

I. Introduction

The data note makes available the blood sugar level data stored in depositories in Statistical Package for the Social Sciences (SPSS) and Microsoft Excel 2016 formats for other researchers and interested individuals to access for statistical analysis, data mining and data modelling. The quantitative data was gathered and analysed in a mixed methods study by Murairwa (2024). The data note presents blood sugar level data for the researcher after being diagnosed with Type 2 diabetes and declared complete remission after two years of taking medication. The researcher gathered 45 blood sugar level data points within 574 days for statistical analysis to detect Type 2 diabetes attacks. The researcher was diagnosed with Type 2 diabetes on 18 September 2018 at Mutare Health Gate Pharmacy in Zimbabwe. The researcher went through different stages of diabetes diagnosis. The process included consulting different health specialists from pharmacists, general practitioners and diabetologists. After diabetes diagnosis and confirmation, the researcher took diabetes control medication for two years before being declared by the diabetologist to be in complete remission. This confirms the findings by the FA(2023). On 23 October 2020, the researcher started gathering blood sugar level data for monitoring Type 2 diabetes attacks (Murairwa, 2024).

However, being in complete remission is not the same as being in permanent remission and thus, one can also experience diabetes attacks. Therefore, there is a need to monitor the blood sugar levels constantly. The objectives of the research (Murairwa, 2024) were to assess the researcher's blood sugar levels, determine the variation of the blood sugar levels, and suggest tips and hints for managing Type 2 diabetes in adult people. Murairwa (2024) hypothesised that the strategies implemented by the researcher to manage hyper glycemia were effective. The minimum blood sugar level data point is 4.6 *mmol/L* recorded on 14 October 2021 and the maximum blood sugar level data point is 7.0 *mmol/L* recorded on 19 December 2020 and 31 May 2021 (Murairwa, 2024). The blood sugar level data presented in this data note was analysed in Murairwa (2024) to address the research objectives.

II. Materials and Methods

Type of Research: This data note presents only the quantitative data gathered and analysed in a mixed methods research by Murairwa (2024). Murairwa (2024) analysed the blood sugar level data to monitor the Type 2 diabetes attacks.

Population, Sample and Data: Murairwa (2024) collected and analysed both qualitative and quantitative data. However, only the primary quantitative data is presented in this data note. The researcher collected 45 blood sugar level data points analysed in Murairwa (2024). The blood sugar level tests were done every morning at 8 am before eating food. The blood sugar level data was gathered from 23 October 2020 to 20 May 2022 on 45 selected days. The blood sugar level data point on 14 October 2021 was recorded at 10 am before eating food because the researcher forgot to test the blood sugar level at 8 am on that day. However, the blood sugar level data point was required because it was measured on the day that was selected for data collection. Therefore, the

researcher collected 7.84% of the possible 574 blood sugar level data points. The blood sugar levels analysed in Murairwa (2024) were measured in millimoles of sugar per litre (mmol/L) according to Mayo Clinic Staff (2021). The reason for collecting data for 45 days was necessitated by the availability of the Code free Blood Glucose Test strip containers of 50 test strips. The researcher used the Code free Blood Glucose Test Strips from one container.

Data Collection Method: The blood sugar level data was gathered after the researcher was advised to stop taking Type 2 diabetes medication and controlling diet. There were no dos and don'ts during the blood sugar level data collection period. The blood sugar levels were tested on days the researcher was visiting the specialist (pharmacist, general practitioner, or diabetologist) for consultation or check-ups. This was necessary for the researcher to verify the accuracy of the SD Code free Blood Sugar Meter.

Data Collection Tools: The SD Blood Glucose Monitoring System (SD BGMS) was used to test the researcher's blood sugar levels during data collection. The Self-Test Diary was used to collect the blood sugar level data. The SD Code free Blood Sugar Meter with the Code free Blood Glucose Test Strips was used to test the blood sugar level. The researcher recorded the test's date and blood sugar level. The SD Code free Blood Sugar Meter is easy to use and gives accurate results without the need for coding (Lee & Heo, 2021).

Data Analysis Tools: The Individual and Moving Range (I-MR) chart was fitted using the benchmark ranges in Sandeep and Dhaliwal(2022). The I-MR chart was used to detect any random Type 2 diabetes attacks. Any blood sugar level below 5.0 mmol/L or above 7.2 mmol/L before eating food was considered a Type 2 diabetes attack. The blood sugar level data was analysed using the regression equation where the independent variable was the days and the dependent variable was the blood sugar levels (Murairwa, 2019; 2016). The regression equation was used to forecast the blood sugar levels. The randomness of the blood sugar level data was tested using the Runs test. Murairwa (2024) applied the one-sample *t*-test to determine whether the strategies employed by the researcher to manage Type 2 diabetes were effective. The results of the statistical analysis of the gathered blood sugar level data were compared against the benchmarks in Dansinger (2023b) and Sandeep and Dhaliwal(2022). The researcher also analysed the five blood sugar level data points gathered during the diagnosis of Type 2 diabetes on 18 September 2018 by the pharmacist and general practitioners.

Ethical Issues: Permission to use the blood sugar level data gathered by the pharmacist, dieticians and diabetologists was sought and granted.

III. Dataset Validation

The researcher consistently tested the blood sugar levels at 8 am except on 14 October 2021. The blood sugar level data point was tested at 10 am before eating food. This can be compared against the normal fasting benchmark in Dansinger (2023b). The randomness of the blood sugar level data was tested with the Runs test. The SD Code free Blood Sugar Meter's accuracy was verified each day the blood sugar level was tested by comparing the researcher's recording with that of the diabetologist. The researcher collected data on the day he had an appointment with the diabetologist.

IV. Major Findings and Discussion

The rest of the results and discussions for this data note are found in Murairwa (2024). Figure 1 shows the variation in the blood sugar of the researcher.

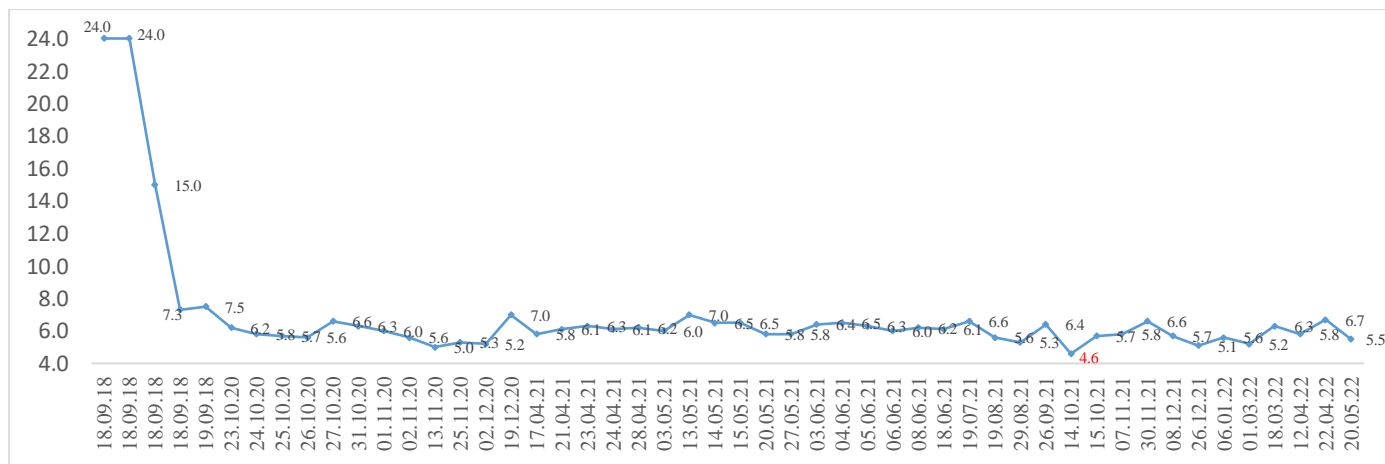


Figure 1: Researcher's Blood Sugar Level Variation(Murairwa, 2024)

Figure 1 presents a curve of the 50 blood sugar level data points. The first five blood sugar level data points were recorded during the diagnosis stage. The last forty-five blood sugar data points were recorded during the complete remission period. Figure 1 shows that during the complete remission period, the blood sugar level was stable and normal. The complete remission period is supported by the findings in FA (2023). Table 1 shows the descriptive statistics of the blood sugar level data.

Table 1: Blood Sugar Level Descriptive Statistics (23/10/20 – 20/05/2022)(Murairwa, 2024)

		<i>mmol/L</i>
N	Valid	45
	Missing	0
Mean		5.964
Std. Error of Mean		0.0795
Median		6.000
Mode		5.8
Std. Deviation		0.5335
Variance		0.285
Skewness		-0.270
Std. Error of Skewness		0.354
Kurtosis		-0.142
Std. Error of Kurtosis		0.695
Range		2.4
Minimum		4.6
Maximum		7.0
Sum		268.4
Percentiles	25	5.60
	50	6.0
	75	6.35

Table 1 shows the descriptive statistics of the blood sugar level data gathered and presented in this data note. The mean of the blood sugar level data is 5.964 *mmol/L* and a standard deviation of 0.5335 *mmol/L*. The statistics confirm the control measurement levels by Dansinger (2023b). The experience of managing Type 2 diabetes led to the development of a framework in Figure 2.

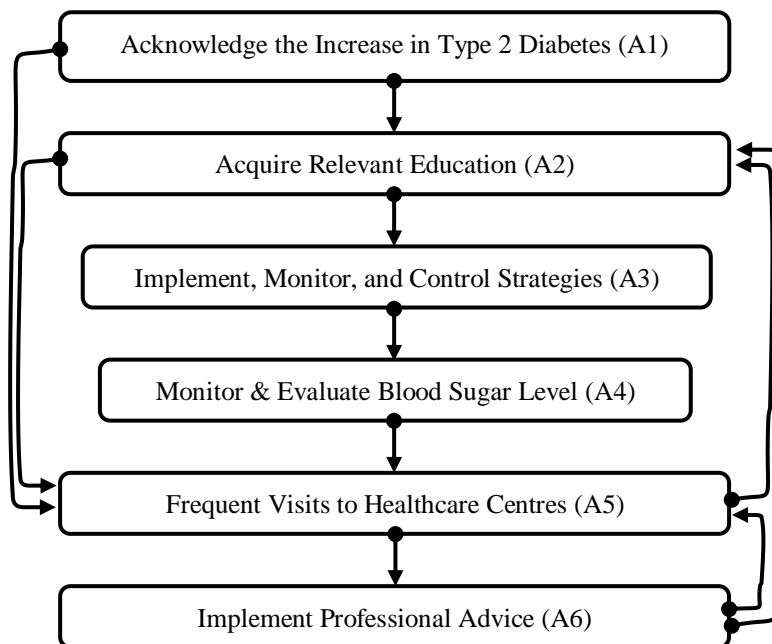


Figure 2: Framework for Managing Type 2 Diabetes (Murairwa, 2024)

The management of the blood sugar level data led to the development of the framework presented in Figure 2. The details of the framework can be read in Murairwa (2024).

V. Conclusion and Recommendation

An adult person with Type 2 diabetes, with the support of specialists, can manage diabetes to complete remission as supported by the findings in FA (2023). The strategies adopted by the researcher to manage Type 2 diabetes were effective as shown by the results in Murairwa (2024). The framework and health diet in Murairwa (2024) can be adopted or adapted to assist in managing Type 2 diabetes in adult persons.

VI. Data Availability Statement

The blood sugar level data in Statistical Package for the Social Sciences (SPSS) 14.0 for Windows Evaluation Version format is available on Google Drive and can be downloaded at the link: [SPSS 14.0 format](#). The blood sugar level data in Microsoft Excel 2016 format is openly available on Google Drive and can be downloaded at the link: [Microsoft Excel 2016 format](#). Anyone interested in accessing the blood sugar level data can open and download it from the links.

Conflict of Interest

The author declares no potential conflicts of interest concerning the blood sugar level data, gathering, and publication of this data note.

Acknowledgement

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