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Research Article

### RELATIONSHIP BETWEEN FREQUENCY OF MONITORING OF BLOOD GLUCOSE LEVEL AND METHOD OF SAMPLING A CROSS SECTIONAL STUDY AT TERTIARY CARE HOSPITAL LARKANA.

Waseem Abbas<sup>1\*</sup>, Nadeem Baloch<sup>1</sup>, Fahad Jibran<sup>1</sup>, Altaf Ali<sup>2</sup>, Rahul Sagar<sup>3</sup>,  
Saiqa Lashari Batool<sup>1</sup>

<sup>1</sup>Department of Pharmacy Shaheed Mohtarma Benazir Bhutto Medical University Larkana,

<sup>2</sup>Faculty of Pharmacy Gomal University, DIA Khan, <sup>3</sup>Chandka Medical College, Shaheed  
Mohtarma Benazir Bhutto Medical University Larkana.

#### Abstract:

*Background: SMBG is expensive practice especially in patients with type 2 diabetes, therefore there is a substantial controversy about this, but it is extensively suggested as a part of diabetes management. It has been found by few randomized controlled trials that self-blood glucose level monitoring is associated with a statistically significant decrease in HbA1c compared with control groups.*

*Methodology: A descriptive study on 400 diabetic patients having age between 30-80 years with the help well designed questionnaire containing the major parameters was conducted in a tertiary care hospital of larkana. Data was evaluated with the help of Spss.20.00 software.*

*Results: Out of 400 diabetic patients 212 were male from those 51 (24%) male were involved in monitoring their blood glucose level with the help of glucometer while 161 (76%) male were involved in checking their blood glucose level by venous puncture. Out of 188 female 67 (35%) female were involved in checking their blood glucose level with the help of glucometer while 121 (65%) female were involved in checking their blood glucose level by venous puncture. All 36, 55, 26 and 3 patients were involved in SMBG on daily, two times in a week, three times weekly and once in a 15 days or months respectively check their blood glucose level with the help of glucometer. 272 diabetic patients who were involved in SMBG once in a 15 days or months check their blood glucose level with the help of venous puncture.*

*Conclusion: It was also observed that the diabetic patients who were follow the recommendation of self-blood glucose level monitoring (SMBG) were involved in checking their blood glucose level with the help of glucometer as compare to venous puncture.*

**Keywords:** Diabetes, SMBG, Glucometer, Venous Puncture, Sampling.

#### Corresponding author:

Waseem Abbas,

Department of Pharmacy,

Shaheed Mohtarma Benazir Bhutto Medical University, Larkana.

Email: [waseemmalhani@yahoo.com](mailto:waseemmalhani@yahoo.com), Telephone No: 00923332794243.

QR code



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**INTRODUCTION:**

Monitoring of the blood glucose level is the way of checking blood glucose level either with the help of glucometer or venous puncture. Self blood glucose monitoring is considered as one of the important tool for diabetic population of both type one and type two diabetes. There is controversial statements about self blood glucose level monitoring in non-insulin user type 2 diabetic population. Critic says that there is no any role of monitoring of blood glucose level in type two diabetic population who are using oral hypoglycemic agents for their glycemic control instead of insulin after one year where as supporters says that self blood glucose monitoring in type two diabetic population who are not using insulin play a great role in improving life quality and satisfaction benefits of diabetic population by empowering them for managing their diabetes and its related outcomes and complications. (1)

National Institute for Health Research Health Technology evaluation program specially made a systematic review of the evidence. (2). They examine the role of SMBG in Type 2 diabetic patients. They found that Self blood glucose level monitoring provides:

- Real time feed back
- Identify abnormal glycemic control
- Provide help in adjusting the dose of medication, diet and physical activity
- Work as educational tool
- Work as motivational tool
- Reduction of diabetic associated complication risk (2).

Depending upon the need of patients SMBG is performed at various times on the same day. Post-prandial glucose level should be performed in diabetic patients whose fasting pre-prandial level is maintained but HbA1C is above the target level. Clinical trials have demonstrated that SMBG level plays greater part in effective glycaemic control for with type 1 diabetic patient and insulin-dependent type 2 diabetic patients by providing help to adjust the insulin dose by monitoring and preventing hypoglycemia and pre-prandial and post-prandial hyperglycemia. Regular SMBG for with type 2 diabetic patients has been recommended (3)

SMBG is expensive practice especially in patients with type 2 diabetes, therefore there is a substantial controversy about this but it is extensively suggested as a part of diabetes management. It has been found by few randomized controlled trials that self monitoring of blood glucose level is associated with a statistically significant decrease in HbA1c compared with control groups (4, 5).

It was suggested by American Diabetes Association's Clinical Practice Recommendations that SMBG has been done on daily basis in type 2 diabetic patient. (6) The aggressive management of hyperglycemia extensively decreases microvascular complications progression have shown by Large, long-term, randomized controlled trials in both type 1 and type 2 diabetes (7, 8). Diabetes with potentially devastating consequences is significant and growing worldwide concern.(9)

**MATERIAL AND METHODS:**

A descriptive study with the help well designed structured questionnaire containing the major parameters was conducted in a tertiary care hospital of larkana. This study was approved from Faculty of Pharmacy, University of Sindh, Jamshoro ethical review committee.

**Sample Size**

400 patients was evaluate by purposive sampling method by using specially designed questionnaire at tertiary care hospital OPD of larkana.

**Inclusion criteria**

Diabetic population having age between 30-80 years old was included in proposed study.

**Exclusion criteria**

The patients suffering from diabetes having kidney problem, liver disorder and alcohol abuse was excluded from the study.

**DATA ANALYSIS:**

Data was evaluated with the help of Spss.20.00 software.

**RESULTS:**

A total of 400 patients was evaluated including 212 male and 188 female with the help of structured questionnaire.

**METHOD OF SAMPLING:**

Out of 400 diabetic patients 212 were male from those 51 (24%) male checked their level of blood glucose with the help of glucometer while 161 (76%) male checked their level of blood glucose by venous

puncture. Out of 188 female 67 (35%) female checked their blood level of glucose with the help of

glucometer while 121 (65%) female checked their blood glucose level by venous puncture

**Table Method of Sampling**

Method of Sampling			
	Observed N	Expected N	Residual
Glucometer	118	200.0	-82.0
Venous Puncture	282	200.0	82.0
Total	400		

Test Statistics	Method of Sampling
Chi-Square	67.240 <sup>a</sup>
Df	1
Asymp. Sig.	.000

**Table Gender \* Method of Sampling**

**Gender \* Method of Sampling Crosstabulation**

		Method of Sampling		Total
		Glucometer	Venous Puncture	
Gender	Count	51	161	212
	% within Gender	24.1%	75.9%	100.0%
	% within Method of Sampling	43.2%	57.1%	53.0%
	% of Total	12.8%	40.2%	53.0%
	Count	67	121	188
	% within Gender	35.6%	64.4%	100.0%
	% within Method of Sampling	56.8%	42.9%	47.0%
	% of Total	16.8%	30.2%	47.0%
Total	Count	118	282	400
	% within Gender	29.5%	70.5%	100.0%
	% within Method of Sampling	100.0%	100.0%	100.0%
	% of Total	29.5%	70.5%	100.0%

**Table Statistical Analysis**

**Chi-Square Tests**

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.426 <sup>a</sup>	1	.011	.012	.008
Continuity Correction <sup>b</sup>	5.882	1	.015		
Likelihood Ratio	6.428	1	.011		
Fisher's Exact Test					
Linear-by-Linear Association	6.410	1	.011		
N of Valid Cases	400				

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	-.127	.011
	Cramer's V	.127	.011
N of Valid Cases		400	

There is no any significant association between gender and method of sampling observed in statistical analysis

#### Method of Sampling and Frequency of SMBG

It has been observed that out of the 36 diabetic patients involved in self-monitoring of blood glucose (SMBG) once daily all of them checked their blood level of glucose with the help of glucometer.

**Table Sampling Method of the Diabetic Patients who were involved in Once daily (SMBG)**

No: Of Patients	Sampling for SMBG by Glucometer	Sampling for SMBG by Venous Puncture	Percentage of Sampling for SMBG by Glucometer	Percentage of Sampling for SMBG by Venous Puncture
36	36	0	100%	0%

Out of the 56 diabetic patients those were involved in self blood glucose level monitoring) two times in a week 55 (98%) diabetic patients check their blood glucose level with the help of glucometer while 1(2%) diabetic patient check his blood glucose level by venous puncture.

**Table Sampling Method of the Diabetic Patients involved in Two Times Weekly (SMBG)**

No: Of Patients	Sampling for SMBG by Glucometer	Sampling for SMBG by Venous Puncture	Percentage of Sampling for SMBG by Glucometer	Percentage of Sampling for SMBG by Venous Puncture
56	55	1	98%	2%

From total 28 diabetic patients those were involved in self blood glucose level monitoring (SMBG) three times in a week 26(92%) diabetic patients checked their blood level of glucose with the help of glucometer while 2(8%) diabetic patients check their blood glucose level by venous puncture

**Table Sampling Method of the Diabetic Patients involved in Three Times Weekly (SMBG)**

No: Of Patients	Sampling for SMBG by Glucometer	Sampling for SMBG by Venous Puncture	Percentage of Sampling for SMBG by Glucometer	Percentage of Sampling for SMBG by Venous Puncture
28	26	2	92%	8%

In current study it has been observed that out of the 280 diabetic patients involved in self blood glucose level monitoring once in a fifteen days or month(s). 3 (1%) diabetic patients checked their blood level of glucose with the help of glucometer while 277 (99%) diabetic patients check their blood glucose level by venous puncture

**Table Sampling Method of the Diabetic Population involved in once in a fifteen Days or Month(s) (SMBG)**

No: Of Patients	Sampling for SMBG by Glucometer	Sampling for SMBG by Venous Puncture	Percentage of Sampling for SMBG by Glucometer	Percentage of Sampling for SMBG by Venous Puncture
280	3	277	1%	99%

**Table Statistical analysis of SMBG Frequency \* Method of Sampling  
Chi-Square Tests**

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	364.522 <sup>a</sup>	3	.000
Likelihood Ratio	419.070	3	.000
Linear-by-Linear Association	323.812	1	.000
N of Valid Cases	400		

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Phi	.955	.000
	Cramer's V	.955	.000
N of Valid Cases		400	

There is significant association between methods of sampling and self blood glucose level monitoring observed in statistical analysis

### DISCUSSION:

A total of 400 patients was evaluated including 53% male and 47% female with the help of structured questionnaire as compare to another study (10) where 52.2% and 47.8% were male and female respectively. According to one study (11) 99% of the diabetic population those were involved in testing their blood glucose level once or more than once a daily were check their blood glucose level with the help of glucometer, 95% of the patients with diabetes checked their blood level of glucose once per week with the help of glucometer and 73% of the patients test their blood glucose level with the help of glucometer compare to current study in which all the 100% diabetic patients those were involved in self blood glucose level monitoring once daily was check their blood glucose level with the help of glucometer, out of the 56 diabetic patients those were involved in self blood glucose level monitoring two times in a week 55 (98%) diabetic patients check their blood glucose level

with the help of glucometer while 1(2%) diabetic patient check his blood glucose level by venous puncture, out of the 28 diabetic population those were involved in self blood glucose level monitoring three times in a week 26 (92%) diabetic patients check their blood level of glucose by using of glucometer while 2(8%) diabetic patients check their blood glucose level by venous puncture and out of the 280 diabetic patients those were involved in self blood glucose level monitoring once in a fifteen days or month(s), 2 (1%) diabetic patients checked their blood glucose level with the help of glucometer while 278 (99%) diabetic patients check their blood glucose level by venous puncture. It has been observed that the patients who were monitoring their blood glucose level with the help of glucometer checked their blood glucose level as per recommendation for maintaining the proper glycemic control. It has been also observed that there is a great need of awareness about the usage of home device glucometer for proper monitoring of blood

level of glucose for prevention of diabetes related problem and obtaining proper glycemic control.

### CONCLUSION:

It was also observed that the diabetic patients who were follow the recommendation of self blood glucose level were involved in checking their blood glucose level with the help of glucometer as compare to venous puncture as it is quite easy to get the reading instantly by glucometer. There is also a need of awareness about the self blood glucose monitoring regularly for proper control of glycaemia and prevention of diabetes related problems.

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