

**A Study on Available Risk factors and Complications
associated with Type 2 diabetes mellitus among the
patients of Chattogram Diabetic General Hospital**

Dr. Moitree Biswas

Roll no: 0120/14

Registration No: 896

Session: 2020-2021

**A thesis submitted in the partial fulfilment of the requirements for the degree of
Masters in Public Health (MPH)**

One Health Institute



**CHATTOGRAM VETERINARY AND ANIMAL SCIENCES UNIVERSITY
CHATTOGRAM**

JUNE, 2022

STATEMENT OF AUTHOR

I, Dr. Moitree Biswas, declare that this thesis is submitted for the fulfilment of the requirements for the Degree of Master of Public Health (MPH), One Health Institute, Chattogram Veterinary and Animal Sciences University. All content of the thesis is copyright material of the author if not referenced or acknowledged. Use of the material may only be made with permission of author and author preserves all rights to make any change in the original document.

DR. MOITREE BISWAS

**A Study on Available Risk factors and Complications
associated with Type 2 diabetes mellitus among the
patients of Chattogram Diabetic General Hospital**

Dr. Moitree Biswas

Roll no: 0120/14

Registration No: 896

Session: 2020-2021

This is to certify that I have examined the above Master's thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made.

Signature of Supervisor

Professor. Dr. Mohammad Alamgir Hossain

**Dean, Faculty of Veterinary Medicine and
Professor, Department of Pathology and
Parasitology**

**Chattogram Veterinary And Animal Sciences
University**

Signature of Co-Supervisor

Dr. Towhida Kamal

**Assistant Professor, Department of
Pathology and Parasitology**

**Chattogram Veterinary And
Animal Sciences University**

Chairman of the Examination Committee

Professor. Sharmin Chowdhury, PhD

Director, One Health Institute

**CHATTOGRAM VETERINARY AND ANIMAL SCIENCES UNIVERSITY
KHULSHI, CHATTOGRAM-4225, BANGLADESH**

JUNE, 2022

We never know the love of a parent till we become parents ourselves.

– **Henry Ward Beecher**

Dedicated to

My loving **parents**

And

Aradhya, the little one who made me a parent

ACKNOWLEDGMENT

All praises to the Almighty God for giving me the opportunity courage and strength to carry out and complete the entire thesis work.

I express my sincere gratitude and regards to my supervisor Professor Dr. Mohammad Alamgir Hossain, Dean, Faculty of Veterinary Medicine, Chattogram Veterinary and Animal Science University (CVASU) and Co-Supervisor Dr. Towhida Kamal, Assistant Professor, Department of Pathology and Parasitology, CVASU for their valuable and critical suggestions, scholarly guidance, blessings, and inspiration throughout the course of this study, research works and preparation of this manuscript.

I am also thankful to Professor Dr. Sharmin Chowdhury, Director of One Health Institute, Chattogram Veterinary and Animal Science University (CVASU) for the facilities provided in carrying out this work.

I would like to express my sincere gratitude to the CASR, CVASU for providing funds for implement this research.

I would like to express my deep sense of gratitude and thanks to my teacher, Professor Dr. Asma Mostafa, Professor and Head; Department of Anatomy and my senior brother Dr. Md. Ibrahim Sohel, Assistant Professor of Department of Anatomy. Chattogram Maa O Sishu Hospital Medical College for solving my different problems regarding thesis work.

In this regard, I thankfully acknowledge all of the participants of Chattogram Diabetic General Hospital. This thesis would not have been possible without their support and cooperation. They allowed me to share their valuable time showing extreme patience and kindness to me during data collection.

I express my lovingly acknowledge to my parents, my husband and my little baby girl, Aradhya for their constant encouragement, sincere support and sacrifice which was the source of my strength during the research work.

Lastly to everybody that has been a part of my life but I failed to mention.

DR. MOITREE BISWAS
JUNE 2022

CONTENTS

Section and content	Page no.
TITLE PAGE	i
STATEMENT OF AUTHOR	ii
SIGNATURE PAGE	iii
DEDICATION	iv
ACKNOWLEDGMENT	v
ABBREVIATION USED IN THE TEXT	xiv
ABSTRACT	xv
CHAPTER 1: INTRODUCTION	1
1:1.0 Background	2
1:2.0 Rationale	5
1:3.0 Research Question	7
1:4.0 Research Objectives	7
CHAPTER 2: LITERATURE REVIEW	8
2:1.0 Diabetes mellitus	9
2:2.0 Types of diabetes mellitus	9
2:3.0 Pathogenesis of DM	12
2:4.0 Risk factors of diabetes mellitus	14
2:5.0 Complications of type 2 diabetes mellitus	16
2:6.0 Risk factors in different journals/ literatures	17
CHAPTER-3: MATERIALS AND METHODS	20
3:1.0 Study design	21

Section and content		Page no.
3:2.0	Period of study	21
3:3.0	Place of data collection	21
3:4.0	Study population	22
3:5.0	Sampling technique	22
3:6.0	Method of Estimating Sample Size	23
3:7.0	Selection of subjects	23
3:7.1	Inclusion Criteria	23
3:7.2	Exclusion Criteria	24
3:8.0	Operational Definitions	24
3:9.0	Instruments used for measuring variables	25
3:10.0	Variables studied	26
3:11.0	Ethical Measures	27
3:12.0	Diagnostic criteria for disease	27
3:13.0	Procedures of Data collection	27
3:14.0	Study plan	29
3:15.0	Data processing & analysis	30
CHAPTER-4: RESULT		31
4:1.0	Age	32
4:2.0	Sex	33
4:3.0	Occupation	34
4:4.0	Educational Status	36
4:5.0	Duration of type 2 diabetes mellitus	37
4:6.0	Clinical symptoms of type 2 diabetes mellitus	38
4:7.0	Physical activity	44
4:8.0	Family history	45
4:9.0	Food Habit	46

Section and content		Page no.
4:10.0	Height, Weight and BMI (Body mass index)	49
4:11.0	Blood glucose level	52
4:12.0	Complications	53
4:13.0	Medication	56
CHAPTER – 5: DISCUSSION		57
5:1.0	Age	58
5:2.0	Sex	58
5:3.0	Occupation	59
5:4.0	Educational Status, Duration of type 2 diabetes mellitus, Clinical symptoms of type 2 diabetes mellitus	59
5:5.0	Physical activity	60
5:6.0	Family history	60
5:7.0	Food Habit	61
5:8.0	Height, Weight and BMI (Body mass index)	61
5:9.0	Blood Sugar	62
5:10.0	Complications	62
5:11.0	Medication	63
CHAPTER – 6: CONCLUSION		65
6:1.0	Conclusion	66
CHAPTER-7: RECOMMENDATIONS AND FUTURE PERSPECTIVES		67
7:1.0	Recommendations	68
7:2.0	Limitations	68
7:3.0	Suggestions for further studies	69
REFERENCES		70

Section and content	Page no.
APPENDICES	xvii
Appendix I Ethical Clearance Certificate by CVASU	xviii-xix
Appendix II Application for taking permission of Data collection from Chattogram Diabetic General Hospital	xx
Appendix III Acceptance letter from Chattogram Diabetic General Hospital	xxi
Appendix IVA Informed Consent form in Bangla	xxii
Appendix IVB Informed Consent form in English	xxiv
Appendix V Questionnaire	xxvi
Appendix VI Time Schedule	xxviii
Appendix VII Master Table	xxix
BIO-DATA OF THE AUTHOR	xl

LIST OF FIGURES

Figure no.	Title	Page no.
LITERATURE REVIEW		
Figure 2.1	Pathogenesis of diabetes mellitus	13
Figure 2.2	Complications of diabetes mellitus	17
MATERIALS AND METHODS		
Figure 3.1	Google map showing Chattogram Diabetic General Hospital & CVASU	22
Figure 3.2	Diagrammatic representation of the stature	24
Figure 3.3	Study plan flow chart showing the sequence of study	29
RESULT		
Figure 4.1	Bar Diagram showing distribution of study participants according to age (n=400)	32
Figure 4.3.1	Bar Diagram showing distribution of study participants according to Occupation (n = 400)	34
Figure 4.3.2	Distribution of study participants according to Occupation by sex (n = 400)	35
Figure 4.4	Bar Diagram showing distribution of study participants according to Educational Status (n = 400)	36
Figure 4.5	Distribution of study participants according to duration (n = 400)	37
Figure 4.6.1	Distribution of study participants according to clinical symptoms (polyuria) by sex (n=400)	40
Figure 4.6.2	Distribution of study participants according to clinical symptoms (polydipsia) by sex (N=400)	40
Figure 4.6.3	Distribution of study participants according to clinical symptoms (polyphagia) by sex (n=400)	41
Figure 4.6.4	Distribution of study participants according to clinical symptoms (weight loss) by sex (n=400)	41
Figure 4.6.5	Distribution of study participants according to clinical symptoms (weight gain) by sex (n=400)	42

Figure no.	Title	Page no.
Figure 4.6.6	Distribution of study participants according to clinical symptoms (delayed wound healing) by sex (n=400)	42
Figure 4.6.7	Distribution of study participants according to clinical symptoms (weakness) by sex (n=400)	43
Figure 4.7.1	Distribution of study participants according to risk factors (Physical activity) by sex (n = 400)	44
Figure 4.8	Distribution of study participants according to family history by sex (n = 400)	45
Figure 4.9.1	Distribution of study participants according to Food habit (Carbohydrate) by sex (n = 400)	47
Figure 4.9.2	Distribution of study participants according to Food habit (Protein) by sex (n = 400)	47
Figure 4.9.3	Distribution of study participants according to Food habit (Fat) by sex (n = 400)	48
Figure 4.10.1	Distribution of study participants according to height (n = 400)	50
Figure 4.10.2	Distribution of study participants according to weight (n = 400)	50
Figure 4.10.3	Distribution of study participants according to BMI group (n = 400)	51

LIST OF TABLES

Table no.	Title	Page no.
RESULT		
Table 4.1	Distribution of study participants according to age(n=400)	32
Table 4.2	Distribution of study participants according to Sex(n=400)	33
Table 4.3.1	Distribution of study participants according to Occupation (n=400)	34
Table 4.3.2	Distribution of study participants according to Occupation by sex (n=400)	35
Table 4.4	Distribution of study participants according to Educational Status (n=400)	36
Table 4.5	Distribution of study participants according to duration of type 2 diabetic mellitus (n=400)	37
Table 4.6	Distribution of study participants according to clinical symptoms by sex (n=400)	38
Table 4.7	Distribution of study participants according to physical activity by sex (n=400)	44
Table 4.8	Distribution of study participants according to family history by sex (n=400)	45
Table 4.9	Distribution of study participants according to Food Habit (n=400)	46
Table 4.10.1	Distribution of study participants according to height-weight (n = 400)	49
Table 4.10.2	Distribution of study participants according to BMI (body mass index) by sex	51
Table 4.11	Distribution of study participants according to Blood Sugar Level (n = 400)	52
Table 4.12.1	Distribution of study participants according to Complications (n = 400)	54
Table 4.12.2	Distribution of study participants according to Complications by age and sex (n=400)	55
Table 4.13.1	Distribution of study participants according to medication (n=400)	56

Table no.	Title	Page no.
Table 4.13.2	Distribution of study participants according to medication by sex (n=400)	56

Abbreviation used in the text

DM= Diabetes Mellitus

HTN= Hypertension

FBS= Fasting blood sugar

2HrPPBS= 2 hours post prandial blood sugar

BMI= Body mass index

CKD= Chronic Kidney Disease

MI= Myocardial Infarction

ABSTRACT

ABSTRACT

Background: Diabetes mellitus is a category of metabolic illnesses characterized by hyperglycemia that is caused by inadequate insulin synthesis or a lack of insulin response. In order to prevent diabetes in the general population, people must be aware of risk factors. The present study investigates the level of awareness of the risk factors for type 2 diabetes mellitus (DM) and it determines among visitors at a tertiary care hospital.

Methods: Under an observational, cross-sectional design, 400 diabetic respondents, aged 45-90 years, were conveniently selected from the out-patient and indoor departments of Chattogram Diabetic General Hospital from December 2021 to June 2022. A pretested, semi-structured questionnaire was developed to assess the knowledge and attitude of the respondents. The analysis was carried out by using descriptive statistics with the help of SPSS (Statistical package for social science) version 20 windows software program.

Results: Among 400 participants, females had a higher chance to develop type 2 diabetes mellitus (DM) than males. Male is common in businessmen (24%) and females are common in housewives (44%) who developed type 2 diabetes mellitus ($P=0.00$). The female had a higher chance to develop type 2 diabetes mellitus due to being overweight ($P = 0.00$). In this study, males, and females who had less physical activity, had more of a chance to develop type 2 DM. Between males and females, females had more chances to develop type 2 DM due to less physical activity ($P = 0.00$). Positive family history leads to type 2 DM and it is common in females ($P = 0.00$). In this study males and females who take more carbohydrates had more chance to develop type 2 DM ($P = 0.05$).

Conclusions: This study will help to identify modifiable and non-modifiable risk factors of type 2 DM. By modifying lifestyle type 2 DM can be prevented and early diagnosis and properly controlled type 2 diabetes mellitus can prevent early complications, which cause many sufferings and may cause death.

Keywords: Diabetes, risk factor, Awareness, Attitude, Bangladesh