**Quality of Life and Its Associated Factors Among Adult Patients with Type II Diabetes in Cox’s Bazar Sadar Hospital, Bangladesh**

**CHAPTER I**

**INTRODUCTION**

**1.1 Introduction**

In the contemporary era, factors such as a rise in life expectancy and a decline in fertility rates have resulted in a global surge in the elderly population. This phenomenon, often referred to as the aging of the world, has emerged as a significant public health challenge in recent times. As individuals enter old age, there is a notable increase in the likelihood of developing chronic diseases. Recent research indicates that approximately 8% of the elderly population is affected by at least one chronic ailment, elevating their susceptibility to disability and mortality. Furthermore, nearly 40% of elderly individuals residing in communities grapple with various limitations attributed to chronic conditions, with diabetes being a prevalent and incapacitating disease among this demographic. The economic burden of diabetes on governments worldwide is substantial (Silva et al., 2018).

Diabetes stands as an escalating metabolic threat in our modern age. Its historical roots date back to an Egyptian manuscript from 1500 BC, where excessive urine discharge was first noted. The term "diabetes" or "to pass through" was coined by the Greek Apollonius of Memphis around 250 BC. In 400-500 BC, Indian physicians Sushruta and Charaka distinguished between type 1 and type 2 diabetes, associating the former with youth and the latter with obesity. Thomas Willis added "mellitus" or "from honey" in the late 1600s, inspired by the sweet taste of diabetic patients' urine. Aretaeus of Cappadocia, an Ancient Greek physician from the 1st century AC, provided the first comprehensive clinical description of diabetes, noting the excessive urine production as a characteristic symptom. This ailment has persisted throughout history, appearing in Aviccena's the Canon of Medicine in medieval Persia and in the Roman Empire, where Galen documented cases of diabetic patients. The term "sugar urine disease" entered Korean and Japanese medicine as táng niào bìng. Although diabetes has been recognized since ancient times, its pathogenesis became clear around 1900, with the discovery of insulin by Canadians Frederick Banting and Charles Best in 1921, followed by its first clinical use in 1922 (Trikkalinou et al., 2017).

Diabetes mellitus (DM) is a chronic condition impacting both developed and developing nations. According to the International Diabetes Federation (IDF), there were 415 million global cases in 2015, a number projected to reach 642 million by 2040. In Sub-Saharan Africa, an estimated 14.2 million adults aged 20–79 grapple with diabetes, with Ethiopia, a highly populated country in the region, bearing the highest-burden at 1.3 million cases and a prevalence of approximately 3.8% (Wolde et al., 2020).

Recognized by the World Health Organization (WHO) as a significant contributor to preventable mortality and morbidity among non-communicable diseases, diabetes is particularly noteworthy for its impact on global health. In 2018, over 500 million people worldwide were living with type 2 diabetes (T2DM), and lifestyle changes and behavioral factors significantly contribute to the escalating diabetes prevalence. Nepal, for instance, saw an increase in T2DM from 8.4% in 2015 to 11.7% in 2017, underscoring the global trend influenced by unhealthy lifestyles. Notably, T2DM is no longer confined to affluent populations, as its prevalence is on the rise in economically disadvantaged communities. The chronic nature of diabetes, coupled with its various complications, adversely affects the quality of life for individuals with T2DM (Chowdhury et al., 2022).

Individuals with T2DM may exhibit no symptoms or experience signs such as polydipsia, polyuria, polyphagia, lethargy, nocturia, and overweight. The diagnosis of DM relies on specific laboratory criteria, including fasting blood glucose levels of 126 mg/dl or 7 mmol/l or higher in two or more sessions following an eight-hour fast, an HbA1C level of 6.5% or more without fasting, an oral glucose tolerance test (OGTT) result of 200 mg/dl or more after consuming 75g of anhydrous glucose dissolved in water, and random blood glucose levels of 200 mg/dl or more accompanied by diabetes symptoms (Jenkusky & Gawlik, 2023).

Quality of life (QoL) serves as a vital global health outcome measure, encompassing physical, psychological, and social dimensions influenced by individual experiences, beliefs, expectations, and perceptions. Healthcare providers must comprehend the multifaceted impacts of chronic diseases like diabetes on patients' physical, emotional, and social well-being. Ample evidence suggests that effective management significantly enhances both immediate and long-term QoL for individuals with type 2 diabetes, making QoL assessment a crucial facet of comprehensive diabetes care (Kueh et al., 2015).

Despite healthcare providers delivering adequate care and support to severely ill diabetes patients, there can be a disparity between patients' and providers' perceptions of QoL. Therefore, the systematic measurement of QoL aids in monitoring treatment adherence, ensuring alignment with guidelines, and enhancing patients' well-being. Analyzing QoL data helps identify subgroups with diminished QoL, guiding targeted interventions to improve their circumstances, prevent severe consequences, allocate resources efficiently based on unmet needs, inform strategic planning, and monitor the effectiveness of interventions. Elevating the quality of life stands as a fundamental goal for the Centers for Disease Control and Prevention, reflecting a critical outcome for all medical interventions in diabetes patients. To enhance the World Health Organization Quality of Life (WHOQOL), healthcare providers must grasp their patients' subjective perceptions of QoL (Trikkalinou et al., 2017).

**1.2 Justification of the Study**

Quality of Life (QoL) is inherently subjective, encompassing dimensions that are challenging to measure directly, relying on individuals' perceived impacts on their lives. Individuals with Type 2 Diabetes (T2DM) often exhibit lower QoL and heightened depressive symptoms compared to those without T2DM. T2DM significantly diminishes patients' quality of life, resulting in higher disability-adjusted life years when compared to many other diseases. This condition induces long-term damage to various organs, accounting for the majority (90%) of all diabetes cases. The complications associated with T2DM are major contributors to morbidity and mortality, exerting a substantial influence on patients' QoL and productivity (Deshpande et al., 2008).

In Bangladesh, individuals with T2DM are predicted to experience a comparatively reduced QoL. The challenges posed by the features, complications, and daily management demands of T2DM impact health-related quality of life, both through macrovascular complications and non-vascular co-morbidities. Despite good access to specialized healthcare in urban areas, T2DM patients in Bangladesh demonstrate a lower quality of life, highlighting the urgent need to assess areas with limited healthcare access (Lewis & Newell, 2014).

While the WHO-BREF tool is widely used for QoL assessment, the D-39 questionnaire, specifically designed for T2DM, provides more precise insights into the dimensions most affected by the condition. This study in Cox’s Bazar seeks to understand the QoL of T2DM patients, considering their socio-economic and clinical status. The anticipated results aim to serve as a foundation for policy development, offering valuable insights into avenues for enhancing the QoL of T2DM patients. Ultimately, this research aims to empower health professionals and contribute to the overall improvement of T2DM patients' QoL in Bangladesh.

**1.3 Operational Definitions**

**Type 2 diabetes:** Type 2 diabetes, previously referred to as non-insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes, may constitute approximately 90 to 95 percent of all diagnosed diabetes cases. This form of diabetes is commonly associated with factors such as older age, obesity, a family history of diabetes, prior gestational diabetes, impaired glucose tolerance, physical inactivity, and race/ethnicity. While traditionally linked to adults, there is an increasing incidence of Type 2 diabetes in children and adolescents. Treatment typically involves oral hypoglycemic agents, including sulfonylureas, biguanides, and newer agents like thiazolidinediones, meglitinides, and alpha-glucosidase inhibitors (Barnett, 2013).

**Quality of Life (QoL):** Quality of Life (QoL), as defined by the World Health Organization (WHO), refers to individuals' perception of their life's position within the cultural and value systems of their environment. It encompasses their goals, expectations, standards, and concerns, and is intricately influenced by physical and psychological health, level of independence, social relationships, and interactions with the environment (Vahedi, 2010).

**1.4 Research Question (s)**

* What is the current condition of the quality of life for individuals with type 2 diabetes mellitus compared to those without type 2 diabetes?
* How does the quality of life of individuals with type 2 diabetes and those without type 2 diabetes correlate with their socio-economic status?
* What is the association between the quality of life for individuals with type 2 diabetes and those without type 2 diabetes concerning socio-economic and clinical factors?

**CHAPTER II**

**LITERATURE REVIEW**

The prevalence of diabetes has significantly risen in both developed and developing nations over the past four decades, primarily attributed to abundant food availability, resulting changes in dietary patterns, and reduced physical activity. As per the International Diabetes Federation, approximately one in every 11 adults globally is afflicted with diabetes (415 million individuals). Projections indicate that by 2040, this prevalence will escalate to one in every 10 adults (642 million individuals). Gestational diabetes affects one in seven births, and 542,000 children worldwide grapple with type 1 diabetes. Alarmingly, every 15 years, an individual succumbs to diabetes, and 12% of global healthcare expenditures are directed towards diabetes-related costs. A concerning aspect is that 46.5% of adults with diabetes remain undiagnosed. A recent Greek study revealed a 10.6% age- and sex-adjusted prevalence of diabetes, with 34% of cases being undiagnosed (Trikkalinou et al., 2017).

The progression of diabetes, particularly inadequate glycemic control, gives rise to numerous potentially life-threatening complications. Nearly half of adults with chronic kidney disease stem from the diabetic population. Additionally, 9.8% of diabetics have experienced a heart attack, 9.1% suffer from coronary artery disease, 7.9% face congestive heart failure, 6.6% have suffered a stroke, and 27.8% contend with chronic kidney disease. Moreover, 22.9% encounter foot problems and 18.9% suffer from eye damage. The cumulative impact of these complications, coupled with metabolic challenges, demands a substantial portion of patients' daily energy, planning, and attention, a situation aptly described by Rubin as "diabetes overwhelms” (Ramsey et al., 2022).

In 1948, the World Health Organization introduced a comprehensive definition of health, considering it not only as the absence of disease and infirmity but also as the presence of physical, mental, and social well-being. Over the subsequent six years, there has been a significant focus on investigating how psychosocial factors impact health outcomes. Quality of Life (QoL) is identified as a multidimensional concept, encompassing an individual's subjective evaluation of psychological, social, and physical well-being. It is crucial to note that QoL involves various domains, each contributing uniquely to the overall perception of well-being, and it should be evaluated based on the patient's self-report rather than the perspective of healthcare professionals. Unlike objective physical health status, which is assessed by physicians through reports of symptoms or the presence of complications, Quality of Life is a patient self-reported measure (Megari, 2013).

According to Czerwik-Kulpa & Chylińska (2017), Quality of Life (QoL) is not a fixed measure but rather an approach to health assessment that centers on patient reports, feelings, and expectations (Czerwik-Kulpa & Chylińska, 2017). QoL, as per Svalastog et al (2017), extends beyond health-related aspects to encompass a broad spectrum of human experiences (Svalastog et al., 2017). To narrow the focus to aspects directly tied to disease, medical treatments, or both, the term Health-Related Quality of Life (HRQOL) was introduced, exploring how health and disease influence overall QoL (Polonsky, 2000). Measurement of health dimensions includes physical, psychological, and social aspects to provide a comprehensive understanding of life functioning. There's a growing acknowledgment that chronic illnesses and their treatments should be assessed for their impact on QoL alongside more traditional medical outcomes like morbidity and mortality (Conradie et al., 2022).

Hareendran (2004) underscores the value of patient-reported outcomes, such as QoL, in evaluating new treatments, particularly in cases where there are no objective markers of symptoms or their impact (Bullinger & Quitmann, 2014). These outcomes complement traditional endpoints, offering insight into the significance of treatment effects from the patient's perspective. Additionally, information on QoL outcomes enhances patient involvement in treatment decision-making. Furthermore, QoL outcomes play a crucial role in guiding healthcare decision-making by providing a deeper understanding of the burden of illnesses and assisting in healthcare allocation decisions. Quality of Life has been identified as a significant objective for public health in the Healthy People 2010 report, outlining health objectives for the U.S. to achieve by 2010. The primary goal of Healthy People 2010 is to enhance life expectancy and improve the quality of life for individuals of all ages. Diseases can affect the QoL of people in different ways depending on the aspects of life that are compromised due to the presence of that disease. The management of diabetes itself has a major impact on people’s lives, in terms of physical and psychological well-being. This is due to the considerable demands imposed by current care practices on persons with diabetes. Complications associated with diabetes have been found to substantially increase the morbidity and mortality of affected persons and to reduce their QoL (Deshpande et al., 2008).

Patients with chronic diseases, such as Type 2 diabetes mellitus, express heightened concerns about their Quality of Life. This chronic condition is often associated with both short-term and long-term complications that can significantly diminish a patient's well-being, health status, and overall quality of life. Numerous studies consistently report a lower quality of life among diabetes patients, particularly in terms of physical functioning and well-being compared to individuals without diabetes (Tafazoli et al., 2017).

Diabetes can negatively impact physical well-being in three major ways. Firstly, the development of long-term complications in diabetic patients, such as vision loss, kidney damage, significant heart disease, erection problems, peripheral neuropathy leading to chronic pain, amputation, and/or impaired movement, contributes significantly to a decline in perceived quality of life. These complications can hinder or limit a patient's ability to work, perform household tasks, or engage in pleasurable activities, thereby impairing their independence and overall functionality (High et al., 2019).

**CHAPTER III**

**RESEARCH METHODOLOGY**

**3.1 Study Objectives**

**General Objective:** The current study seeks to assess the quality of life and its determinants among adult individuals with Type 2 diabetes receiving care in Cox’s Bazar district Sadar Hospital.

**Specific Objectives:**

* To evaluate the quality of life in individuals with Type 2 diabetes mellitus and those without Type 2 diabetes.
* To examine the association between the quality of life in Type 2 diabetic patients and non-Type 2 diabetes patients with their socio-economic status.
* To explore the association between the quality of life in Type 2 diabetic patients and non-Type 2 diabetes patients with socio-economic and clinical factors.

**3.2 Conceptual Framework**

**Dependent Variable**

**Independent Variables**

**Socio-Demographic**

Age, Sex, Ethnicity

Family type, Marital Status

Religion, Residence

Educational Status

Occupation

Physical exercise

Smoking Habit

Alcohol Consumption

Counseling

Wealth index

Living status

**Clinical**

Diabetes-related complications

Confirmed co-morbidity

Duration of diabetes mellitus since diagnosis

Body Mass Index

Fasting blood glucose levels.

Physical trauma

Family history

Drug regimen

WHOQOL-BREF (domains: Physical health, Psychological, environmental, and social)

**3.3 Study Design**

This study employed a descriptive, cross-sectional study design, chosen for its suitability in collecting data on various variables from participants at a single point in time. The research adopted a community-based approach to examine the Quality of Life (QoL) of individuals with Type 2 diabetes.

**Socio-economic variable:** The socio-economic variables utilized in this study, includes education and cultural factors, occupation, family dynamics, family possessions, home sanitation, economic status, and healthcare access.

**The second part (History taking):** Developed by the researcher, this section collected data on family history of diabetes, medical history of hypertension (HTN), previous surgical history, duration of follow-up, and smoking status.

**The third part (Medical data):** This segment covered the duration since the initial diagnosis of diabetes, the presence of diabetes complications, medical nutrition therapy, regularity of physical activity, glycated hemoglobin (HbA1c) level, and treatment regimen.

**The fourth part (Bio-physiological measurement):** This component includes Body Mass Index (BMI) and random blood sugar test (RBS). Weight was measured without shoes and heavy clothing, and height was measured with the patient standing straight on a flat surface. BMI was calculated as weight in kilograms divided by the square of height in meters. BMI categories followed international classifications: underweight (<18.50 kg/m2), normal range (18.50 - 24.99 kg/m2), and overweight (≥25.00 kg/m2)."

**Blood Sugar (RBS) test:** This involved obtaining a capillary blood sample through a needle stick, with the blood analyzed at a random time. The blood sugar level was measured in milligrams per deciliter (mg/dl). A random blood sugar level of 200 mg/dl or higher indicates diabetes, particularly when accompanied by symptoms such as frequent urination and extreme thirst.

**World Health Organization Quality of Life Questionnaire Abbreviated version (WHOQoL-Bref):** This questionnaire comprises 26 items, including two individual items assessing the overall quality of life and satisfaction with health. The remaining 24 items are grouped into four domains: physical health, psychological health, social relationships, and environment. Participants responded to each question on a 5-point Likert scale, with scores ranging from 1 to 5. Responses included very dissatisfied/very poor (coded as 1), dissatisfied/poor (coded as 2), neither dissatisfied nor satisfied/neither poor nor good (coded as 3), satisfied/good (coded as 4), and very satisfied/very good (coded as 5). The questions addressed experiences over the past two weeks (WHO, 2012).

**Scoring System:** The WHOQOL-BREF (Field Trial Version) generated four domain scores, with two individual items assessed separately: question 1, which inquired about an individual's overall perception of quality of life, and question 2, which focused on an individual's overall perception of their health. Domain scores were oriented positively, where higher scores indicated a better quality of life. The mean score of items within each domain was computed to determine the domain score. Mean scores were then multiplied by 4 to align them with the scores utilized in the WHOQOL-100. The first transformation method converted raw scores to transformed scores within a range of 4-20, making them comparable with the WHOQOL-100. The manual calculation method for individual domain scores is outlined below:

Physical Health Domain = ((6 - Q3) + (6 - Q4) + Q10 + Q15 + Q16 + Q17 + Q18).

Psychological Health Domain = (Q5 + Q6 + Q7 + Q11 + Q19 + (6 - Q26)).

Social Relationships Domain = (Q20 + Q21 + Q22).

Environmental Domain = (Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25).

The second transformation method scaled domain scores to a 0-100 range, utilizing the formula:

Transformed Scale = (Actual Raw Score − Lowest Possible Raw Score) × (100 / Possible Raw Score Range), where the actual raw score represents the values achieved through summation, the lowest possible raw score is the lowest attainable value through summation (4 for all facets), and the possible raw score range is the difference between the maximum possible raw score and the lowest possible raw score (16 for all facets: 20 – 4).

In instances where more than 20% of data were missing, the assessment was discarded. If up to two items were missing, the mean of other items in the domain was substituted. For cases with more than two missing items from the domain, the domain score was not calculated (except for domain 3, where the domain was calculated only if < 1 item was missing). A total score was computed by summing scores across all items, resulting in a WHOQOL-BREF score range of 26 to 130. The study adopted the following values: a score ≤ 45 denoted low Quality of Life (QOL), a score 46–65 indicated moderate QOL, and a score > 65 suggested relatively high QOL (WHO, 2012).

**3.4 Target Population & Sample Population**

The target population in a study is the group to which the study aims to extend its findings, often known as the theoretical population. In this particular study, the target population encompasses all women within the reproductive age range of 18 years and above. Meanwhile, the study population pertains to the actual sampling frame from which a sample is selected. In this study, the study population consisted of women between the ages of 18 years and above in Bangladesh who met the specified inclusion and exclusion criteria.

**3.5 Study Site & Area**

Cox’s Bazar District Sadar Hospital is located in southeastern part of Bangaldesh, which is 150 km (93 mi) south of the city of Chittagong. The city covers an area of 23.4 km2 (9.0 sq mi) with 58 mahallas and 27 wards and as of 2022 had a population of nearly 200,000.

**3.6 Study Period**

An institutional-based cross-sectional study will be conducted from October 01, 2024, to November 15, 2024 in Cox’s Bazar District Sadar Hospital among type 2 diabetic adult patients.

**3.7 Sample Size**

The required sample size was determined by using single population proportion formula with basic assumptions of 95% confidence interval, 5% margin of error, and 73.6% estimated proportion of good health-related quality of life from a previous study (Saleh et al., 2014). Hence, the following formula was used for sample size calculation for the first objective:

The formula is: n =

Where, n = estimated sample size

Z = 1.96 (in 95% Confidence Interval)

p = prevalence, 73.6% (0.736),

q = 1- 0.736 = 0.264,

d = permissible error, 5% (0.05)

So, sample size (n) = {(1.96)2\*0.736\*0.264}/ (0.05)2 = 299. Additional participants will be included in the sample size calculation to account for any missing data, resulting approximately 350 patients will be interviewed for the study.

**3.8 Inclusion Criteria**

Patients with type 2 diabetes mellitus were approached in the outpatient department of Camp-1W Health Post. Inclusion criteria were patients diagnosed with T2DM and aged 18 years and above with no obvious cognitive deficit.

**3.9 Exclusion Criteria**

Patients who did not match the inclusion criteria or who did not give their consent to participate in the study were not involved in the study.

**3.11 Data Collection Tools**

The primary researcher and research assistants conducted interviews with the study participants to gather quantitative data. The questionnaire encompassed inquiries about demographic and socio-economic details, featuring a combination of open-ended and closed-ended questions. The questionnaire was structured into three sections: the first section, labeled as socio-demographic (Section A), the second section, focusing on the clinical features of participants (Section B), and the third, focusing on QoL (Section C).

**3.12 Data Management & Analysis Plan**

Data collection will involve conducting face-to-face interviews. Before initiating data collection, permission will be sought from the respective couples. A comprehensive explanation of the study's purpose will be provided to the respondents. The interviews will be conducted within the slum area. Respondents will receive assurance, from an ethical standpoint, that the content of the interview will remain confidential and will not be disclosed to any unauthorized individuals.

**Data Preparation:** The data will be thoroughly cleaned and prepared for analysis, which includes the identification of missing values, outliers, and any other irregularities within the data.

**Descriptive Statistics:** Descriptive statistics will be calculated for the variables of interest. This will involve determining measures such as the mean, median, standard deviation, and frequency distribution. These calculations will provide insights into the data's distribution and facilitate the identification of outliers or unusual observations.

**Inferential Statistics:** Inferential statistical tests will be conducted to examine the study's hypotheses. These tests may include a chi-square test and logistic regression to assess the association between QoL and various socioeconomic factors.

**Interpretation of Results:** The results of the statistical tests will be interpreted, taking into consideration elements such as p-values, effect sizes, and confidence intervals. Typically, a p-value below 0.05 is considered indicative of statistical significance, implying that there is less than a 5% probability that the results are due to random chance.

**3.13 Quality Control & Quality Assurance**

Before collecting data from the respondents, a friendly and welcoming environment was established, and the research objectives were clearly communicated to the participants. Throughout the data collection process, an effort was made to engage with the respondents in the local Bangla language.

**3.14 Ethical Considerations**

Written permission will be obtained from the relevant authorities and the respondents before commencing data collection. The investigator will provide the respondents with a detailed explanation of the study's objectives before collecting data.

**3.15 Expected Outcomes**

We anticipate that there is a noteworthy correlation between the QoL of Type 2 diabetes patients with various socioeconomic factors. We hypothesize that there is a relationship between the quality of life of type 2 diabetes, socio-economic status, and clinical factors related to diabetes mellitus.

**3.16 Work Plan**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Activities** | **Jun**  **2023** | **Jul**  **2023** | **Aug**  **2023** | **Sep**  **2023** | **Oct**  **2023** | **Nov**  **2023** | **Dec**  **2023** | **Jan**  **2023** |
| **Designing the Study** |  |  |  |  |  |  |  |  |
| **Review of Literature** |  |  |  |  |  |  |  |  |
| **Development & approval of proposal** |  |  |  |  |  |  |  |  |
| **Development of Data Collection Tools** |  |  |  |  |  |  |  |  |
| **Pre-testing Questionnaire** |  |  |  |  |  |  |  |  |
| **Data Collection, Entry & Analysis** |  |  |  |  |  |  |  |  |
| **Report Writing** |  |  |  |  |  |  |  |  |
| **Submission & Approval of Thesis** |  |  |  |  |  |  |  |  |
| **Printing, Binding, and Submission** |  |  |  |  |  |  |  |  |

**REFERENCES**

Barnett, A. H. (2013). Complementing insulin therapy to achieve glycemic control. *Advances in Therapy*, *30*(6), 557–576. https://doi.org/10.1007/s12325-013-0039-y

Bullinger, M., & Quitmann, J. (2014). Quality of life as patient-reported outcomes: principles of assessment. *Dialogues in Clinical Neuroscience*, *16*(2), 137. https://doi.org/10.31887/DCNS.2014.16.2/MBULLINGER

Chowdhury, M. A. B., Islam, M., Rahman, J., Uddin, M. J., & Haque, M. R. (2022). Original research: Diabetes among adults in Bangladesh: changes in prevalence and risk factors between two cross-sectional surveys. *BMJ Open*, *12*(8). https://doi.org/10.1136/BMJOPEN-2021-055044

Conradie, A., Atherton, J., Chowdhury, E., Duong, M. N., Schwarz, N., Worthley, S., & Eccleston, D. (2022). Health-Related Quality of Life (HRQoL) and the Effect on Outcome in Patients Presenting with Coronary Artery Disease and Treated with Percutaneous Coronary Intervention (PCI): Differences Noted by Sex and Age. *Journal of Clinical Medicine*, *11*(17). https://doi.org/10.3390/JCM11175231/S1

Czerwik-Kulpa, M., & Chylińska, J. (2017). Quality of Life in Palliative Care. *Expert Review of Quality of Life in Cancer Care*, *2*(6), 293. https://doi.org/10.1080/23809000.2017.1400911

Deshpande, A. D., Harris-Hayes, M., & Schootman, M. (2008). Epidemiology of Diabetes and Diabetes-Related Complications. *Physical Therapy*, *88*(11), 1254. https://doi.org/10.2522/PTJ.20080020

High, K. P., Zieman, S., Gurwitz, J., Hill, C., Lai, J., Robinson, T., Schonberg, M., & Whitson, H. (2019). Use of Functional Assessment to Define Therapeutic Goals and Treatment. *Journal of the American Geriatrics Society*, *67*(9), 1782. https://doi.org/10.1111/JGS.15975

Jenkusky, L. M., & Gawlik, K. S. (2023). Glucose Tolerance Test. *Laboratory Screening and Diagnostic Evaluation: An Evidence-Based Approach*, 373–376. https://doi.org/10.5005/jp/books/14203\_21

Kueh, Y. C., Morris, T., Borkoles, E., & Shee, H. (2015). Modelling of diabetes knowledge, attitudes, self-management, and quality of life: A cross-sectional study with an Australian sample. *Health and Quality of Life Outcomes*, *13*(1), 1–11. https://doi.org/10.1186/S12955-015-0303-8/FIGURES/3

Lewis, C. P., & Newell, J. N. (2014). Patients’ perspectives of care for type 2 diabetes in Bangladesh –a qualitative study. *BMC Public Health*, *14*(1), 737. https://doi.org/10.1186/1471-2458-14-737

Megari, K. (2013). Quality of Life in Chronic Disease Patients. *Health Psychology Research*, *1*(3), 27. https://doi.org/10.4081/HPR.2013.E27

Ramsey, D. J., Kwan, J. T., & Sharma, A. (2022). Keeping an eye on the diabetic foot: The connection between diabetic eye disease and wound healing in the lower extremity. *World Journal of Diabetes*, *13*(12), 1035. https://doi.org/10.4239/WJD.V13.I12.1035

Saleh, F., Mumu, S. J., Ara, F., Hafez, M. A., & Ali, L. (2014). Non-adherence to self-care practices & medication and health related quality of life among patients with type 2 diabetes: A cross-sectional study. *BMC Public Health*, *14*(1), 1–8. https://doi.org/10.1186/1471-2458-14-431/TABLES/4

Silva, J. A. Da, Souza, E. C. F. De, Echazú Böschemeier, A. G., Costa, C. C. M. Da, Bezerra, H. S., & Feitosa, E. E. L. C. (2018). Diagnosis of diabetes mellitus and living with a chronic condition: participatory study. *BMC Public Health*, *18*(1). https://doi.org/10.1186/S12889-018-5637-9

Svalastog, A. L., Donev, D., Kristoffersen, N. J., & Gajović, S. (2017). Concepts and definitions of health and health-related values in the knowledge landscapes of the digital society. *Croatian Medical Journal*, *58*(6), 431. https://doi.org/10.3325/CMJ.2017.58.431

Tafazoli, M., Parnan, A., & Azmoude, E. (2017). Sexual function and quality of life in diabetic women referring to health care centers in Mashhad. *Journal of Education and Health Promotion*, *6*(1), 25. https://doi.org/10.4103/JEHP.JEHP\_33\_15

Trikkalinou, A., Papazafiropoulou, A. K., & Melidonis, A. (2017). Type 2 diabetes and quality of life. *World Journal of Diabetes*, *8*(4), 120. https://doi.org/10.4239/WJD.V8.I4.120

Vahedi, S. (2010). World Health Organization Quality-of-Life Scale (WHOQOL-BREF): Analyses of Their Item Response Theory Properties Based on the Graded Responses Model. *Iranian Journal of Psychiatry*, *5*(4), 140. /pmc/articles/PMC3395923/

WHO. (2012). *WHOQOL - Measuring Quality of Life*. https://www.who.int/tools/whoqol

Wolde, H. F., Derso, T., Biks, G. A., Yitayal, M., Ayele, T. A., Gelaye, K. A., Demissie, G. D., Azale, T., Misganaw, B., Kebede, A., Teshome, D. F., Dellie, E., Gebremedhin, T., & Atnafu, A. (2020). High Hidden Burden of Diabetes Mellitus among Adults Aged 18 Years and Above in Urban Northwest Ethiopia. *Journal of Diabetes Research*, *2020*. https://doi.org/10.1155/2020/9240398

**APPENDICES**

**APPENDIX-A**

**CONSENT FORM**

Hello, my name is (your name). We are from the North South University (NSU). We are surveying the situation of children, families, and households. I would like to talk to you about your health and other topics. This interview usually takes about 45 minutes. We are also interviewing mothers about their children. All the information we obtain will remain strictly confidential and anonymous. If you wish not to answer a question or wish to stop the interview, please let me know. May I start now?

**APPENDIX-C**

**QUESTIONNAIRE**

**ABOUT YOU**

Before you begin, we would like to ask you to answer a few general questions about yourself: by circling the correct answer or by filling in the space provided.

**Socio-Demographic**

What is your **age**?

What is your **gender**? Male Female

What is your **ethnicity**?

What is your **family type**?

What is your **marital status**? Single Separated Married Divorced Living as married Widowed

What is your **religion**?

Where is your **residence**?

What is the highest **education** you received? None at all

Primary school

Secondary school

Tertiary

What is your **occupation**?

Do you take **physical exercise**?

Do you have **smoking habit**?

Do you have **alcohol consumption**?

Do you take **counselling**?

What is your **wealth index**?

What is your **living status**?

**Clinical**

Do you have **diabetes-related complications?**

Do you have **confirmed co-morbidity?**

What is your **duration of diabetes mellitus since diagnosis?**

What is your **Body Mass Index?**

What is your **Fasting blood glucose levels?**

Do you have **Physical trauma?**

Do you have **Family history?**

Do you have **Drug regimen?**

**Instructions**

This assessment asks how you feel about your quality of life, health, or other areas of your life. **Please answer all the questions.** If you are unsure about which response to give to a question, **please choose the one** that appears most appropriate. This can often be your first response.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last two weeks.** For example, thinking about the last two weeks, a question might ask:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Do you get the kind of support from others that you need? | Not at all  1 | Not much  2 | Moderately  3 | A great deal  4 | Completely  5 |

You should circle the number that best fits how much support you got from others over the last two weeks. So you would circle the number 4 if you got a great deal of support from others as follows.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Do you get the kind of support from others that you need? | Not at all  1 | Not much  2 | Moderately  3 | A great deal  4 | Completely  5 |

You would circle number 1 if you did not get any of the support that you needed from others in the last two weeks.

MSA/MNH/PSF/97.6

Page 17

### Please read each question, assess your feelings, and circle the number on the scale for each question that gives the best answer for you.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Very poor | Poor | Neither poor nor good | Good | Very good |
| 1(G1) | How would you rate your quality of life? | 1 | 2 | 3 | 4 | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Very dissatisfied | Dissatisfied | Neither satisfied nor dissatisfied | Satisfied | Very satisfied |
| 2 (G4) | How satisfied are you with your health? | 1 | 2 | 3 | 4 | 5 |

The following questions ask about **how much** you have experienced certain things in the last two weeks.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Not at all | A little | A moderate amount | Very much | An extreme amount |
| 3 (F1.4) | To what extent do you feel that physical pain prevents you from doing what you need to do? | 1 | 2 | 3 | 4 | 5 |
| 4(F11.3) | How much do you need any medical treatment to function in your daily life? | 1 | 2 | 3 | 4 | 5 |
| 5(F4.1) | How much do you enjoy life? | 1 | 2 | 3 | 4 | 5 |
| 6(F24.2) | To what extent do you feel your life to be meaningful? | 1 | 2 | 3 | 4 | 5 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Not at all | A little | A moderate amount | Very much | Extremely |
| 7(F5.3) | How well are you able to concentrate? | 1 | 2 | 3 | 4 | 5 |
| 8 (F16.1) | How safe do you feel in your daily life? | 1 | 2 | 3 | 4 | 5 |
| 9 (F22.1) | How healthy is your physical environment? | 1 | 2 | 3 | 4 | 5 |

The following questions ask about **how completely** you experience or were able to do certain things in the last two weeks.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Not at all | A little | Moderately | Mostly | Completely |
| 10 (F2.1) | Do you have enough energy for everyday life? | 1 | 2 | 3 | 4 | 5 |
| 11 (F7.1) | Are you able to accept your bodily appearance? | 1 | 2 | 3 | 4 | 5 |
| 12 (F18.1) | Have you enough money to meet your needs? | 1 | 2 | 3 | 4 | 5 |
| 13 (F20.1) | How available to you is the information that you need in your day-to-day life? | 1 | 2 | 3 | 4 | 5 |
| 14 (F21.1) | To what extent do you have the opportunity for leisure activities? | 1 | 2 | 3 | 4 | 5 |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Very poor | Poor | Neither poor nor good | Good | Very good |
| 15 (F9.1) | How well are you able to get around? | 1 | 2 | 3 | 4 | 5 |

The following questions ask you to say how **good or satisfied** you have felt about various aspects of your life over the last two weeks.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Very dissatisfied | Dissatisfied | Neither satisfied nor dissatisfied | Satisfied | Very satisfied |
| 16 (F3.3) | How satisfied are you with your sleep? | 1 | 2 | 3 | 4 | 5 |
| 17 (F10.3) | How satisfied are you with your ability to perform your daily living activities? | 1 | 2 | 3 | 4 | 5 |
| 18(F12.4) | How satisfied are you with your capacity for work? | 1 | 2 | 3 | 4 | 5 |
| 19 (F6.3) | How satisfied are you with yourself? | 1 | 2 | 3 | 4 | 5 |
| 20(F13.3) | How satisfied are you with your personal relationships? | 1 | 2 | 3 | 4 | 5 |
| 21(F15.3) | How satisfied are you with your sex life? | 1 | 2 | 3 | 4 | 5 |
| 22(F14.4) | How satisfied are you with the support you get from your friends? | 1 | 2 | 3 | 4 | 5 |
| 23(F17.3) | How satisfied are you with the conditions of your living place? | 1 | 2 | 3 | 4 | 5 |
| 24(F19.3) | How satisfied are you with your access to health services? | 1 | 2 | 3 | 4 | 5 |
| 25(F23.3) | How satisfied are you with your transport? | 1 | 2 | 3 | 4 | 5 |

The following question refers to **how often** you have felt or experienced certain things in the last two weeks.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Never | Seldom | Quite often | Very often | Always |
| 26 (F8.1) | How often do you have negative feelings such as blue mood, despair, anxiety, depression? | 1 | 2 | 3 | 4 | 5 |

Did someone help you to fill out this form?..............................................................................................................

How long did it take to fill this form out?.................................................................................................................

**Do you have any comments about the assessment?**

.............................................................................................................................................................................................

.............................................................................................................................................................................................

**THANK YOU FOR YOUR HELP**

**APPENDIX-D**

**QUESTIONNAIRE (BENGALI)**

……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………