University of Dongola
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Research Proposal

Research Proposal Title

Clinical and Behavioral Determinants of Blood Pressure Control Among Adults With Type 2 Diabetes Mellitus Attending Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan: 2026

Proposed by

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1. Introduction

1.1 Background Information

Blood pressure (BP) control among individuals with type 2 diabetes mellitus (T2DM) remains suboptimal worldwide. An updated meta-analysis of 63 studies involving 1,618,972 individuals with T2DM found that only 41% (95% CI: 34–47%) achieved guideline-recommended BP targets.[1] Effective diabetes management therefore requires not only glycemic control but also management of cardiovascular risk factors, particularly BP. Evidence from sub-Saharan Africa (SSA) indicates persistent difficulties in achieving optimal BP control.[2] A systematic review of 21 SSA studies estimated that 69.8% of people with diabetes had suboptimal BP control, with suboptimal antihypertensive medication adherence and overweight significantly associated with poor BP control.[2]

Across Africa, a systematic review of 109 studies involving 63,890 adults with T2DM found that only 38% achieved optimal BP control and reported a substantial burden of diabetes complications, including retinopathy, nephropathy, neuropathy, foot ulcers, and peripheral arterial disease.[3] In Sudan, hypertension was reported in 47.7% of patients with diabetes, with age, BMI, serum creatinine, and diabetic retinopathy significantly associated with hypertension.[4] Studies from Ethiopia, Ghana, Nigeria, Tanzania, and Kenya similarly demonstrate inadequate BP control and identify factors including older age, longer disease duration, smoking, suboptimal medication adherence, uncontrolled glycemia, overweight/obesity, physical inactivity, and treatment burden.[5] - [11]

Medication adherence is an important concern in Sudan. At a Khartoum diabetes centre, only 15.0% of participants demonstrated high antidiabetic medication adherence, while 40.4% demonstrated low adherence; reported barriers included adverse effects, herbal medicine use, and medication unavailability.[12] Diabetes self-management also requires sustained medication adherence, dietary modification, physical activity, glucose monitoring, and appropriate healthcare utilization, with evidence from SSA indicating generally inadequate performance across these domains.[13] A recent systematic review covering 28 SSA countries reported

suboptimal adherence to antihypertensive medication, dietary advice, physical activity, and self-monitoring, while education, self-efficacy, and social support were important determinants.[14]

Evidence from Ethiopia found medication adherence and physical exercise independently associated with BP control.[15] A Ghanaian longitudinal cohort showed that BP control improved during follow-up but remained suboptimal, with suboptimal medication adherence, longer hypertension duration, diabetes comorbidity, and treatment burden associated with BP control.[16] Sudanese studies have also reported suboptimal antidiabetic medication adherence,[17] while a Khartoum interventional study demonstrated that clinical pharmacist-led diabetes education improved medication-adherence scores, highlighting the potential value of patient education and professional support.[18]

1.21.2 Problem Statement

The coexistence of type 2 diabetes mellitus (T2DM) and hypertension substantially increases cardiovascular and renal risk, yet BP control remains inadequate. Across sub-Saharan Africa, 69.8% of people with diabetes have suboptimal BP control, while an African meta-analysis found that only 38% of patients with T2DM achieved optimal BP control.[2,3] Studies from Sudan and other African countries have identified clinical and behavioral factors associated with BP control, including disease duration, overweight/obesity, glycemic control, medication adherence, physical activity, smoking, and treatment burden.[4–11,16] Sudanese studies also demonstrate suboptimal antidiabetic medication adherence and treatment-related barriers.[12,17,18]

Despite this evidence, an important local research gap remains in Dongola City and Northern State. The level of BP control and the independent clinical and behavioral factors associated with uncontrolled BP among adults with T2DM attending Jameeh Diabetes Hospital have not been established. Evidence from other settings may not be directly applicable because healthcare access, medication availability, socioeconomic conditions, lifestyle practices, and patient characteristics can differ.[9,14]

1.3 Justification and Rationale of the Study

This study is justified by the need to generate local observational evidence on BP control among adults with T2DM in Dongola. By measuring BP control and examining its association with relevant clinical and behavioral characteristics, the study will identify factors independently associated with uncontrolled BP within this population. The findings may help clinicians recognize patients at higher risk and inform locally appropriate clinical assessment, counseling, and follow-up. The study will also provide baseline data for Jameeh Diabetes Hospital and Northern State, supporting future research, including longitudinal and interventional studies, and contributing to the regional evidence base on BP control in T2DM.

1.4 General and Specific Objectives

1.4.1 General Objective

To assessment BP control and identify clinical and behavioral factors independently associated with BP control among patients with T2DM attending Jameeh Diabetes Hospital, Dongola City, Northern State, Sudan, in 2026.

4.2 Specific Objectives

1. To determine the proportion of patients with controlled BP.

2. To describe the sociodemographic, clinical, and behavioral characteristics of the study participants.

3. To assess the association between BP control and sociodemographic and clinical factors, including age, sex, BMI, diabetes duration, HbA1c, hypertension/treatment group, dyslipidemia, and comorbidities.

4. To assess the association between BP control and behavioral factors, including antihypertensive medication adherence, salt restriction, appointment keeping, physical activity, tobacco use, and home BP monitoring.

5. To identify factors independently associated with BP control using multivariable logistic regression.

1.5 Research Questions

1.5.1 Main Research Question

What is the level of BP control, and which clinical and behavioral factors are independently associated with BP control among patients with T2DM attending Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan?

1.5.2 Specific Research Questions

1. What proportion of patients with T2DM attending Jameeh Diabetes Hospital have controlled BP, overall and by hypertension/antihypertensive treatment group?
2. What are the sociodemographic, clinical, and behavioral characteristics of these patients?
3. Are the prespecified sociodemographic and clinical factors associated with BP control?
4. Are the prespecified behavioral factors associated with BP control?
5. Which clinical and behavioral factors remain independently associated with BP control after multivariable adjustment?

1.6 Research Hypotheses

1.6.1 Null Hypothesis (H0)

There is no statistically significant association between the studied clinical and behavioral factors and BP control among patients with T2DM attending Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan.

1.6.2 Alternative Hypothesis (H1)

At least one of the studied clinical or behavioral factors is significantly associated with BP control among patients with T2DM attending Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan.

1.6.3 Specific Alternative Hypotheses

1. Older age, higher BMI, longer duration of T2DM, poor glycemic control (HbA1c ≥7%), dyslipidemia, and selected comorbidities are associated with higher odds of uncontrolled BP.
2. Poorer adherence to prescribed antihypertensive medication, inadequate dietary salt restriction, physical inactivity, tobacco use, and less frequent out-of-facility BP monitoring are associated with higher odds of uncontrolled BP.
3. Selected clinical and behavioral factors remain independently associated with uncontrolled BP after adjustment in the multivariable logistic regression model.

2. 2. Literature Review

2.1 Type 2 Diabetes Mellitus, Hypertension and BP Control

Type 2 diabetes mellitus (T2DM) and hypertension frequently coexist because of shared risk factors such as increasing age, obesity, sedentary behavior, and adverse metabolic profiles. Their coexistence increases cardiovascular and renal risk, making BP control an essential component of diabetes care.[2,4,8,10] In Sudan, hypertension was reported in 47.7% of patients with diabetes and was associated with age, BMI, serum creatinine, and retinopathy.[4] High hypertension burdens have also been reported in Nigeria.[7,8]

BP control remains inadequate across Africa. A systematic review of 21 sub-Saharan African studies estimated that 69.8% of diabetic patients had suboptimal BP control, with overweight and poor antihypertensive medication adherence significantly associated with poor control.[2] An African meta-analysis of 109 studies involving 63,890 adults with T2DM found that only 38% achieved the defined optimal BP goal.[3] Studies from Ethiopia, Ghana, Tanzania, and Kenya similarly documented inadequate BP control and identified factors including age, disease duration, obesity, glycemic control, medication adherence, physical activity, smoking, and treatment burden.[5,6,10,11,16]

2.2 Clinical and Behavioral Determinants

Clinical factors associated with BP control include age, duration of diabetes or hypertension, BMI, glycemic status, renal function, complications, and comorbidities. In Ethiopia, older age, longer hypertension duration, smoking, medication nonadherence, and uncontrolled glycemia were associated with uncontrolled BP.[5] A Ghanaian longitudinal study similarly identified longer hypertension duration, diabetes comorbidity, treatment burden, and nonadherence as relevant factors.[16] Overweight was associated with suboptimal BP control in the African meta-analysis, while BMI and serum creatinine were associated with hypertension in Sudan.[2,4]

Medication adherence is a particularly important behavioral determinant. Poor adherence to antihypertensive treatment was associated with suboptimal BP control in sub-Saharan Africa and independently associated with uncontrolled BP in Ethiopia and Ghana.[2,5,16] A review of 312 studies involving 108,014 participants across 28 sub-Saharan African countries found suboptimal adherence to antihypertensive medication, dietary recommendations, physical activity, and self-monitoring, with education, self-efficacy, and social support identified as important determinants.[14] Earlier evidence also found generally inadequate diabetes self-management across sub-Saharan Africa.[13]

Lifestyle factors may further influence BP control. Physical inactivity was associated with poor BP control in Ethiopia and Tanzania, while smoking was independently associated with uncontrolled BP in Ethiopia.[5,10] Dietary practices and self-monitoring remain suboptimal across the region.[14,15] Healthcare-related factors, including medication availability, treatment barriers, education, and treatment burden, may also contribute to inadequate control.[12,14,16]

2.3 Evidence From Sudan and the Research Gap

Sudanese evidence demonstrates both a substantial hypertension burden and challenges with medication adherence. In a Khartoum diabetes centre, only 15% of patients with T2DM demonstrated high adherence to antidiabetic medication, while 40.4% had low adherence; reported barriers included medication side effects, herbal medicine use, and medication unavailability.[12] Another Sudanese study reported suboptimal antidiabetic medication adherence and examined treatment-related factors.[17] A clinical pharmacist-led intervention in Khartoum improved medication-adherence scores, highlighting the potential relevance of patient education and professional support.[18]

Although studies from Sudan and other African countries provide evidence on hypertension, BP control, and adherence, limited evidence has examined BP control as the primary outcome together with its clinical and behavioral determinants in Northern State, particularly Dongola City. Differences in healthcare access, medication availability, socioeconomic conditions, lifestyle practices, and patient characteristics limit direct generalization from other settings.[2,4-11]

The proposed study will therefore determine the level of BP control and identify clinical and behavioral factors independently associated with BP control among patients with T2DM attending Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan.

3. Materials and Methods

3.1 Study Design

An analytical cross-sectional study will be conducted to determine the proportion of patients with type 2 diabetes mellitus (T2DM) who have controlled blood pressure (BP) and to identify clinical and behavioral factors associated with BP control.

3.2 Study Setting

The study will be conducted at Jameeh Diabetes Hospital in Dongola City, Northern State, Sudan, which provides specialized diabetes care and follow-up services for patients with diabetes from Dongola and surrounding areas.

The hospital provides routine outpatient diabetes services, including clinical assessment, BP measurement, blood glucose monitoring, medication management, counseling, and follow-up of diabetes-related complications and comorbidities.

3.3 Study Population

The study population will comprise adult patients diagnosed with T2DM who attend the diabetes outpatient clinic at Jameeh Diabetes Hospital during the study period.

3.3.1 Inclusion Criteria

Participants will be eligible if they:

- Are aged 18 years or older.
- Have a documented diagnosis of T2DM.
- Have attended the diabetes clinic during the study period.
- Have been receiving diabetes care for at least three months.
- Are able to provide informed consent.

3.3.2 Exclusion Criteria

Patients will be excluded if they:

- Are pregnant.
- Are acutely ill or clinically unstable at the time of data collection.
- Are unable to provide reliable information because of severe cognitive or communication difficulties.

3.4 Study Period

The study will be conducted from September to November 2026, subject to ethical approval and facility permission. Data collection will be conducted over approximately four weeks within this period.

3.5 Sample Size Determination

The base sample size for estimating the proportion of participants with controlled BP was calculated using the single-proportion formula:

$n = Z^2P(1-P) / d^2$

Where Z = 1.96 for a 95% confidence level, P = 0.50 (used because no sufficiently precise local estimate was available), and d = 0.05 margin of error.

Application:

$n = (1.96)^2 \times 0.50 \times (1-0.50) / (0.05)^2$

$n = 3.8416 \times 0.50 \times 0.50 / 0.0025$

$n = 0.9604 / 0.0025$

$n = 384.16$

The base sample size is therefore rounded up to 385 participants. To allow for approximately 10% non-response or incomplete data, the recruitment target will be 428 participants (385/0.90 = 427.8, rounded up). The final multivariable logistic regression model will be restricted according to the observed number of uncontrolled-BP events and the number of candidate parameters to reduce the risk of overfitting.[20]

3.6 Sampling Technique

A systematic random sampling technique will be used to recruit eligible participants from the diabetes clinic register during the study period. The sampling interval (k) will be calculated as N/428, where N is the estimated number of eligible patients available during the defined data-collection period and 428 is the recruitment target (Section 3.5). A random starting point between 1 and k will be selected, followed by every kth eligible participant until the recruitment target is reached.

If the eligible population is smaller than the target sample, all eligible patients will be invited. If a complete register is unavailable, the alternative recruitment procedure will be specified and documented before recruitment begins.

3.7 Study Variables

3.7.1 Dependent Variable

The primary dependent variable is BP control, classified as a binary outcome (controlled BP or uncontrolled BP) using the prespecified primary threshold. BP will be based on the measured clinic BP obtained during the study visit, not on self-report alone.

3.7.2 Independent Variables

The independent variables will be restricted to variables actually collected by the study questionnaire and medical-record abstraction.

Sociodemographic factors

- Age, sex, marital status, residence, educational level, occupation, and monthly household income.

Clinical factors

- Duration of T2DM
- Documented hypertension and duration of hypertension
- BMI
- HbA1c/glycemic control
- Current antihypertensive treatment and number of antihypertensive medications
- Dyslipidemia
- Ischemic heart disease
- Chronic kidney disease
- Serum creatinine/eGFR and UACR, where available
- Other documented comorbidities recorded in the questionnaire

Behavioral factors

- Antihypertensive medication adherence (Hill-Bone, among participants prescribed antihypertensive medication)
- Dietary/salt practices
- Physical activity (IPAQ-SF)
- Tobacco use
- Out-of-facility BP monitoring

Variables not explicitly collected in the questionnaire, including medication affordability/availability, adverse effects, treatment complexity, healthcare access, counseling,

blood-glucose self-monitoring, and clinic-attendance adherence, will not be treated as study predictors unless they are added to the approved data-collection tool before recruitment.

3.8 Operational Definitions

Table 3.1: Operational definitions of the study terms

Term	Definition
Blood pressure control	For the primary analysis, BP control will be defined as SBP<140 mmHg AND DBP<90 mmHg. This is a prespecified study classification for comparability with the literature and does not replace individualized clinical treatment targets.[19] A sensitivity analysis will classify BP control as <130/80 mmHg.
Hypertension	Hypertension will be defined as a documented diagnosis in the medical record or current use of antihypertensive medication.
Type 2 diabetes mellitus	T2DM will require a documented diagnosis of T2DM in the medical record.
Medication adherence	Adherence will be assessed using the complete 14-item Hill-Bone instrument[21] among participants prescribed antihypertensive medication. The authorized version and official scoring instructions will be used, with the scoring procedure defined before analysis.
Physical activity	Physical activity will be assessed using the official Arabic IPAQ-SF and its standard scoring protocol.[22]
Out-of-facility BP monitoring	This will be defined as self-reported measurement of BP outside the healthcare facility, with location and frequency recorded.
Body mass index (BMI)	BMI = weight (kg) / height² (m²). BMI categories will be classified using prespecified WHO criteria.
Poor glycemic control	Poor glycemic control will be defined as HbA1c ≥7.0% for the primary analysis, while HbA1c<7.0% will be classified as controlled. HbA1c measured within the three months before or during the study visit will be used where available. The 7.0% threshold reflects the HbA1c goal recommended for many nonpregnant adults with diabetes, while individual clinical targets may differ.[23]

3.9 Data Collection Tool

Data will be collected using a structured interviewer-administered Arabic questionnaire combined with medical-record abstraction (Annex C). The structure of the tool is summarized in Table 3.2.

Table 3.2: Structure of the data-collection tool

Section	Content
Administrative data	Participant code, interview date, and data-collector code.
Section 1	Sociodemographic characteristics.
Section 2	Clinical characteristics and laboratory data (interview and medical-record review).
Section 3	Standardized BP and anthropometric measurements.
Section 4	Behavioral factors: (4-a) antihypertensive medication adherence using the complete 14-item Hill-Bone instrument; (4-b) physical activity using the official Arabic IPAQ-SF; (4-c) tobacco use, including smokeless tobacco; (4-d) out-of-facility BP monitoring.

The Hill-Bone scale will be administered to participants prescribed antihypertensive medication, using the authorized version and official scoring instructions. The questionnaire will only include variables approved in the protocol and explicitly represented in the data-collection form. No separate healthcare-related predictor section will be analyzed unless the corresponding variables are added to the approved questionnaire before recruitment. Any translated or copyrighted instrument will be used in its authorized/validated form and attached to the final approved study package before data collection.

3.10 Blood Pressure Measurement

BP will be measured using a validated, appropriately sized automated BP device. Participants will be asked to:

- Avoid vigorous physical activity, smoking, and caffeinated beverages shortly before measurement where feasible.
- Rest quietly for at least five minutes before measurement.
- Sit with their back supported and feet on the floor.
- Keep the arm supported at approximately heart level.
- Use an appropriately sized cuff.

Two BP measurements will be obtained at an appropriate interval, and the average of the measurements will be used for the primary analysis. If the first and second measurements differ substantially, a third measurement will be obtained and the prespecified averaging procedure will be applied.

3.11 Anthropometric Measurements

Body weight will be measured using a calibrated weighing scale with participants wearing light clothing and without shoes.

Height will be measured using a standardized height-measuring device.

BMI will be calculated by dividing weight in kilograms by height in meters squared.

The weighing and height-measurement equipment will be checked regularly to ensure accurate measurements.

3.12 Data Quality Assurance

Several measures will be implemented to ensure data quality.

The questionnaire will be reviewed by experts in pharmacology, medicine, epidemiology, and public health to assess content validity.

The questionnaire will be pretested among a small group of eligible patients at a healthcare facility not included in the main study.

Data collectors will receive training regarding:

- Participant recruitment
- Informed consent
- Questionnaire administration
- BP measurement
- Anthropometric measurements
- Medical-record abstraction
- Confidentiality

Completed questionnaires will be reviewed daily for completeness and consistency. Data will be checked for missing values, inconsistencies, and implausible measurements before statistical analysis.

3.13 Data Management and Statistical Analysis

Data will be entered, cleaned, coded, and analyzed using IBM SPSS Statistics version 27 or a comparable current version.

3.13.1 Descriptive Analysis

Categorical variables will be summarized using frequencies and percentages. Continuous variables will be summarized using the mean and standard deviation for approximately normally distributed variables, and the median and interquartile range for skewed variables. The proportion of participants with controlled and uncontrolled BP will be reported with a 95% confidence interval.

3.13.2 Bivariate Analysis

The association between BP control and categorical independent variables will initially be assessed using the Pearson chi-square test. Fisher's exact test will be used when chi-square assumptions are not met. For continuous variables, an independent-samples t-test will be used for approximately normally distributed data and the Mann–Whitney U test for skewed/non-normally distributed data, as appropriate. Crude odds ratios (CORs) with 95% confidence intervals will be estimated using binary logistic regression.

3.13.3 Multivariable Analysis

Candidate predictors will be selected a priori from the study objectives, conceptual framework, and relevant literature. Bivariate p-values will be used only as supplementary information and not as the sole basis for variable selection. The final binary logistic regression model will be restricted according to the observed number of uncontrolled-BP events and the number of candidate parameters to reduce overfitting.[20]

The dependent variable will be coded 0 = controlled BP and 1 = uncontrolled BP. Adjusted odds ratios (AORs), 95% confidence intervals, and two-sided p-values will be reported. Statistical significance will be set at $p<0.05$. Multicollinearity will be assessed before fitting the final model, and model fit will be evaluated using an appropriate goodness-of-fit procedure such as the Hosmer–Lemeshow test.

3.14 Handling of Missing Data

The extent and pattern of missing data will be assessed before analysis. If missingness is minimal (≤5% for a variable), complete-case analysis may be used. If missingness is greater than 5%, the pattern and likely mechanism of missingness will be assessed; an appropriate method, including multiple imputation where justified, will be considered and fully reported. The amount of missing data for each key variable will be presented.

3.15 Ethical Considerations

Ethical approval will be obtained from the Research Ethics Committee of the ministry of health Northern State before commencement of the study.

Permission to conduct the study will be obtained from the administration of Jameeh Diabetes Hospital.

Participants will receive information about the purpose and procedures of the study before enrollment.

Participation will be voluntary, and participants will have the right to withdraw at any time without affecting their medical care.

No unnecessary personal identifiers will be collected. Study data will be kept confidential and used exclusively for research purposes.

Participants found to have markedly elevated BP or other clinically concerning findings during assessment will be referred to the attending clinical team for appropriate evaluation and management.

3.16 Dissemination of Findings

The findings will be presented to the University of Dongola and relevant health authorities. The results may also be submitted for publication in a peer-reviewed scientific journal and presented at relevant scientific conferences.

4. Research Plan

The research team (student investigators and trained data collectors, under the supervision of the study supervisor) will, in sequence: (1) finalize the Arabic data collection tool; (2) obtain ethical approval and facility permission; (3) pilot-test the tool, train data collectors, and calibrate BP devices; (4) recruit participants by systematic random sampling from the outpatient diabetes clinic registers and administer the questionnaire together with BP and anthropometric measurement; (5) review, clean, and double-enter data into SPSS; (6) conduct bivariate and multivariable analyses; and (7) write up and disseminate the findings to the hospital, Northern State Ministry of Health, and through peer-reviewed publication.

4.1 Time-line

Table 4.1: Study time-line, September–November 2026

Activity	September	October	November
Proposal finalization&ethical approval			
Tool translation, pilot testing&data collector training			
Data collection		4 weeks	
Data entry, cleaning&analysis			
Report writing&dissemination			

Note: The time-line is tentative (2026) and depends on ethical approval and facility permission. Data collection will start only after ethical approval and completion of pilot testing; if approval is delayed, subsequent activities will be adjusted accordingly.

4.2 Budget Breakdown

Table 4.2: Estimated budget (Sudanese pounds, SDG)

Budget item	Estimated cost (SDG)
Personnel (data collectors, supervisor)	0
Stationery&questionnaire printing (428 × 1,000)	428,000
BP devices, anthropometric equipment&calibration	0
Transport	100,000
Data entry&statistical software	0
Communication&miscellaneous	100,000
Subtotal	626,000
Contingency (10% of subtotal)	62.8
Total	688,800

Note: Printing is calculated for the target recruitment sample of 428 participants. The final sample may be lower if fewer eligible patients are available, but recruitment will follow the approved sampling procedure. Pilot-test copies are not included.

5. References

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6. Annexes

Annex A: Hill-Bone Compliance to High Blood Pressure Therapy Scale

The Hill-Bone Compliance to High Blood Pressure Therapy Scale is a 14-item interviewer-administered instrument assessing three domains of antihypertensive-treatment behavior: medication taking (9 items), reduced sodium intake (3 items), and appointment keeping (2 items).[21] Responses are scored on a four-point scale, with the specified appointment-keeping item reverse-coded according to the developers' scoring instructions. The original instrument is scored by summing item responses; lower total scores indicate better compliance under the stated coding scheme. The official instrument will be attached to the final approved data-collection package, and any Arabic administration will follow an approved translation/adaptation procedure before pilot testing.

Table A.1: Domains of the Hill-Bone scale

Subscale	No. of items	Behavior assessed
Medication taking	9	Taking prescribed antihypertensive medication as directed
Reduced sodium intake	3	Dietary salt restriction
Appointment keeping	2	Keeping scheduled clinic appointments
Total	**14**	**Overall adherence to antihypertensive therapy**

Annex C: Data Collection Questionnaire (Arabic)

The structured, interviewer-administered Arabic questionnaire is presentedbelow. It covers sociodemographic characteristics, clinical information, standardized BP and anthropometric measurements, antihypertensive medication adherence, lifestyle/behavioral factors, and out-of-facility BP monitoring. The complete authorized Arabic Hill-Bone instrument and official Arabic IPAQ-SF will be attached and administered in their approved form before data collection.

استبيان جمع البيانات

المحددات السريرية والسلوكية للتحكم في ضغط الدم بين مرضى السكري من النوع الثاني، مستشفى جميح للسكري، دنقلا، 2026

البيانات الإدارية	
.....	رمز المشارك
..... / ..... /	تاريخ المقابلة
.....	رمز جامع البيانات

القسم الأول: الخصائص الاجتماعية والديموغرافية

الإجابة	السؤال
..... سنة	1. العمر (بالسنوات)
σ ذكر σ أنثى	2. الجنس
σ أعزب σ متزوج σ مطلق σ أرمل	3. الحالة الاجتماعية
σ لا يقرأ ولا يكتب / خلوة σ أساس σ ثانوي σ جامعي فأعلى	4. المستوى التعليمي
σ موظف σ عمل حر / تجارة σ مزارع σ ربة منزل σ متقاعد σ لا يعمل σ أخرى:	5. المهنة الحالية
σ حضر (مدينة دنقلا) σ ريف / محلية أخرى	6. مكان الإقامة
..... جنيه سوداني	7. الدخل الشهري التقريبي للأسرة
σ يكفي ويفيض σ يكفي بالكاد σ لا يكفي	8. هل يكفي دخل الأسرة لتغطية احتياجاتها الأساسية؟

القسم الثاني: الخصائص السريرية (بالمقابلة ومراجعة الملف الطبي)

السؤال	الإجابة
9. مدة الإصابة بداء السكري من النوع الثاني	..... سنة
10. العلاج الحالي لداء السكري	σ أقراص فقط σ إنسولين فقط σ أقراص وإنسولين σ نظام غذائي فقط
11. هل يوجد تشخيص موثق بارتفاع ضغط الدم في الملف الطبي؟	σ نعم σ لا
12. هل يتناول المشارك حالياً دواءً واحداً على الأقل لخفض ضغط الدم؟	σ نعم σ لا
13. مجموعة المشارك (تُحدد من السؤالين السابقين)	σ أ: يتناول أدوية لضغط الدم σ ب: تشخيص موثق بارتفاع الضغط ولا يتناول أدوية σ ج: لا تشخيص موثق ولا يتناول أدوية
14. أدوية ضغط الدم الحالية (إن وُجدت، من الملف الطبي)	σ مثبطات ACE أو ARB σ حاصرات قنوات الكالسيوم σ مدرّات البول σ حاصرات بيتا σ أخرى عدد أدوية الضغط: ..... σ لا ينطبق
15. الأمراض المصاحبة الموثقة في الملف (يمكن اختيار أكثر من إجابة؛ المعايير أسفل الجدول)	σ مرض الكلى المزمن σ مرض القلب الإقفاري σ اضطراب دهون الدم σ لا يوجد σ أخرى: .....
16. آخر HbA1c مسجل خلال الأشهر الثلاثة الماضية	النتيجة (بالنسبة المئوية): ..... تاريخ التحليل: ..... / ..... σ غير متوفر (يُسجَّل مفقوداً)
17. آخر سكر صائم (معلومة تكميلية فقط، لا يُعتمد بديلاً عن HbA1c)	النتيجة: ..... التاريخ: ..... / ..... σ غير متوفر
18. آخر فحص دهون (من الملف)	الكوليسترول الكلي: ..... الكوليسترول الضار (LDL): ..... الكوليسترول النافع (HDL): ..... الدهون الثلاثية: ..... σ غير متوفر
19. هل يتناول المشارك حالياً دواءً خافضاً للدهون؟	σ نعم σ لا
20. آخر معدل ترشيح كبيبي eGFR من الملف	النتيجة: ..... التاريخ: ..... / ..... σ غير متوفر
21. آخر نسبة الألبومين إلى الكرياتينين في البول UACR من الملف	النتيجة: ..... التاريخ: ..... / ..... σ غير متوفر

معايير التصنيف المعتمدة:

اضطراب دهون الدم: تشخيص موثق في الملف الطبي، أو استخدام دواء خافض للدهون، أو وجود ثلاثيات دهنية ≥150 مغ/دل، أو HDL منخفض (أقل من 40 مغ/دل للرجال أو أقل من 50 مغ/دل للنساء) عند توفر النتيجة.

مرض الكلى المزمن: تشخيص موثق لمرض الكلى المزمن في الملف الطبي؛ وتُسجَّل قيم eGFR وUACR كمتغيرات مخبرية عند توفرها دون اعتبار نتيجة واحدة وحدها دليلاً كافياً على المزمنة.

مرض القلب الإقفاري: تاريخ موثق لمتلازمة تاجية حادة أو احتشاء عضلة القلب أو ذبحة صدرية أو إعادة توعية تاجية. عند عدم توفر النتائج المخبرية يُعتمد التشخيص الموثق فقط.

القسم الثالث: قياس ضغط الدم والقياسات الجسمية

يُقاس ضغط الدم بجهاز معايَر وكفّة بمقاس مناسب، بعد أن يجلس المشارك مرتاحاً 5 دقائق وقدماه مسنودتان على الأرض وذراعه مسنودة عند مستوى القلب، دون كلام أثناء القياس، بفاصل دقيقة إلى دقيقتين بين القراءتين، ويُعتمد متوسط القراءتين.

السؤال	الإجابة
22. القراءة الأولى (mmHg)	الانقباضي: ..... الانبساطي: .....
23. القراءة الثانية (mmHg)	الانقباضي: ..... الانبساطي: .....
24. المتوسط (mmHg)	الانقباضي: ..... الانبساطي: .....
25. الذراع المستخدمة ومقاس الكفّة (بند جودة القياس)	σ اليمنى σ اليسرى σ صغير σ عادي σ كبير
26. هل تناول المشارك قهوة أو دخّن أو مارس مجهوداً بدنياً خلال 30 دقيقة قبل القياس؟ (بند لضبط جودة القياس، ولا يُحلَّل كعامل مرتبط)	σ نعم σ لا
27. التصنيف الأساسي لضبط الضغط (للتحليل الرئيسي)	σ مضبوط: الانقباضي أقل من 140 والانبساطي أقل من 90 σ غير مضبوط: الانقباضي 140 فأكثر أو الانبساطي 90 فأكثر
28. التصنيف الثانوي (للتحليل الحساس فقط)	σ أقل من 130/80 σ 130/80 فأكثر
29. الوزن	..... كجم
30. الطول	..... سم
31. مؤشر كتلة الجسم BMI (كجم/م²، يُحسب)	.....

القسم الرابع: العوامل السلوكية

4-أ: الالتزام بعلاج ضغط الدم (مقياس Hill-Bone)

يُستخدم مقياس Hill-Bone Compliance to High Blood Pressure Therapy Scale المكوَّن من 14 بنداً وثلاثة محاور: تناول الدواء (9 بنود)، وتقليل الصوديوم (3 بنود)، والالتزام بالمواعيد (بندان). تُسجَّل الاستجابات على مقياس من 4 نقاط، مع عكس ترميز البند السادس وفق ورقة تصحيح الأداة. تُجمع درجات البنود والمحاور وفق تعليمات المطوِّرين، وتدل الدرجة الكلية الأقل على التزام أفضل بعد تطبيق الترميز المعتمد.(20) سيُستخدم الإصدار العربي المعتمد إن كان متاحاً، أو ستُجرى ترجمة أمامية وخلفية واختبار تجريبي قبل بدء جمع البيانات. يُطبَّق محور

تناول الدواء على المشاركين الذين يتناولون أدوية خافضة لضغط الدم، بينما يُطبَّق المحوران الآخران وفق شروط الأداة المعتمدة.

الإجابة	السؤال
.....	32. درجة محور تقليل الملح (3 بنود؛ المدى من 3 إلى 12)
.....	33. درجة محور الالتزام بالمواعيد (بندان؛ المدى من 2 إلى 8)
..... σ لا ينطبق (لا يتناول أدوية الضغط)	34. درجة محور تناول الدواء (9 بنود؛ المدى من 9 إلى 36)
..... σ لا ينطبق (لا يتناول أدوية الضغط)	35. الدرجة الكلية (14 بنداً؛ المدى من 14 إلى 56)

4-ب: النشاط البدني (IPAQ-SF)

سيُرفق الإصدار العربي الرسمي من IPAQ-SF مع النسخة النهائية المعتمدة من أداة جمع البيانات، ولن تُعاد صياغة بنود الأداة. سيُطبَّق بروتوكول التصحيح الرسمي للأداة، بما في ذلك حساب النشاط البدني بوحدة MET-min/week وتصنيف مستوى النشاط وفق معايير IPAQ المعتمدة.

الإجابة	السؤال
..... يوم في الأسبوع σ لا يوجد نشاط شاق	36. البند 1 (IPAQ-SF): عدد أيام ممارسة النشاط البدني الشاق خلال آخر 7 أيام
..... ساعة ..... دقيقة σ لا أعرف / غير متأكد	37. البند 2: الوقت المعتاد يومياً للنشاط البدني الشاق
..... يوم في الأسبوع σ لا يوجد نشاط متوسط	38. البند 3: عدد أيام ممارسة النشاط البدني المتوسط (دون المشي)
..... ساعة ..... دقيقة σ لا أعرف / غير متأكد	39. البند 4: الوقت المعتاد يومياً للنشاط البدني المتوسط
..... يوم في الأسبوع σ لا يوجد مشي	40. البند 5: عدد أيام المشي (10 دقائق متواصلة على الأقل)
..... ساعة ..... دقيقة σ لا أعرف / غير متأكد	41. البند 6: الوقت المعتاد يومياً للمشي
..... ساعة ..... دقيقة σ لا أعرف / غير متأكد	42. البند 7: وقت الجلوس في يوم عادي خلال آخر 7 أيام
.....	43. مجموع النشاط البدني بوحدة MET-دقيقة/أسبوع (يُحسب وفق بروتوكول IPAQ الرسمي)
σ منخفض σ متوسط σ عالٍ	44. فئة النشاط البدني (وفق البروتوكول الرسمي)

4-ج: استعمال التبغ

الإجابة	السؤال

الإجابة	السؤال
σ لم يدخن أبداً σ مدخن سابق σ مدخن حالي إن كان مدخناً حالياً: عدد السجائر في اليوم	45. التدخين (السجائر)
σ لم يستعمله أبداً σ مستعمل سابق σ مستعمل حالي	46. استعمال التمباك (التبغ غير المدخن)

4-د: قياس ضغط الدم خارج المنشأة الصحية

الإجابة	السؤال
σ نعم σ لا	47. هل يوجد في المنزل جهاز لقياس ضغط الدم؟
σ نعم σ لا إن كانت الإجابة نعم، أين؟ σ المنزل σ الصيدلية σ مكان آخر:	48. هل تقيس ضغطك بانتظام خارج المنشأة الصحية؟
σ يومياً σ أسبوعياً σ شهرياً σ أقل من مرة في الشهر أو عند الأعراض فقط	49. إن كانت الإجابة نعم، كم مرة تقيس ضغطك؟

ختام الاستبيان

σ نعم، تمت الإحالة σ لا	50. هل سُجلت قراءة ضغط مرتفعة بشكل ملحوظ أو نتيجة مقلقة استدعت إحالة المشارك إلى الفريق الطبي المعالج؟
.....	ملاحظات جامع البيانات

شكراً لك على وقتك ومشاركتك.

Important: The complete authorized Hill-Bone and official Arabic IPAQ-SF forms must be attached to the approved questionnaire before recruitment.