

Supplementary File 1

English Version of the Study Questionnaire

Knowledge–Practice Gap, Attitudes, and Determinants of Dengue Management Practices Among Physicians in Sudan: A Cross-Sectional Study, 2026

This supplementary file contains the English version of the questionnaire used in this study. The questionnaire was adapted from the validated dengue Knowledge, Attitude and Practice (KAP) questionnaire developed by Yusuf and Ibrahim and modified to reflect the Sudanese physician context and the objectives of the present study.

Participant Information

Dear Physician,

You are invited to participate in this research study entitled "**Knowledge–Practice Gap, Attitudes, and Determinants of Dengue Management Practices Among Physicians in Sudan: A Cross-Sectional Study, 2026.**"

Participation is entirely voluntary. All responses will remain anonymous and confidential and will be used solely for research purposes. By completing this questionnaire, you indicate your informed consent to participate in this study.

Informed Consent

Do you agree to participate in this study?

☐ Yes

☐ No

Section 1. Sociodemographic Characteristics

1. Age

☐ Under 30 years

☐ 30 years or older

2. Sex

☐ Male

☐ Female

3. Marital status

- ☐ Single
 - ☐ Married
-

4. Nationality

- ☐ Sudanese
 - ☐ Non-Sudanese
-

5. Professional level

- ☐ House Officer
 - ☐ General Practitioner
 - ☐ Registrar/Resident
 - ☐ Specialist
 - ☐ Consultant
-

6. If you are a Registrar, Specialist, or Consultant, please indicate your specialty.

- ☐ Internal Medicine
 - ☐ Surgery
 - ☐ Pediatrics
 - ☐ Emergency Medicine
 - ☐ Family Medicine
 - ☐ Dermatology
 - ☐ Orthopaedics
 - ☐ Ear, Nose and Throat (ENT)
 - ☐ Other: _____
-

7. Work sector

- ☐ Governmental

☐ Private

8. Healthcare facility

☐ Health Center

☐ Primary Hospital

☐ Referral Hospital

9. Years of clinical practice

☐ Less than 1 year

☐ 1–5 years

☐ 5–10 years

☐ More than 10 years

10. Region of residence

☐ Northern

☐ Southern

☐ Central

☐ Eastern

☐ Western

Section 2. Knowledge of Dengue Fever

11. Have you ever received formal information or training about dengue fever?

☐ During medical school

☐ After graduation

☐ No

12. Have you heard about dengue fever outbreaks in Sudan?

☐ Yes

☐ No

13. If yes, what was your primary source of information?

☐ Television/Radio

☐ Printed media

☐ Medical school/Teacher

☐ Social media

☐ Other: _____

14. Have you ever managed a patient with dengue fever?

☐ Yes

☐ No

15. Approximately how many patients with dengue fever have you managed during your clinical practice?

☐ None

☐ 1–2

☐ 3–4

☐ More than 5

16. Which of the following are symptoms of dengue fever? *(Select all that apply.)*

☐ Fever

☐ Headache

☐ Muscle pain

☐ Retro-orbital pain

☐ Petechial rash

☐ Positive tourniquet test

☐ Vomiting

- ☐ Ascites
 - ☐ Constipation
 - ☐ Diarrhea
 - ☐ Edema
 - ☐ Thrombocytopenia
 - ☐ Dyspnea
 - ☐ Chest pain
 - ☐ Jaundice
 - ☐ Dysuria
 - ☐ Persistent cough
 - ☐ Nasal discharge
 - ☐ Lymphadenopathy
-

17. What is the incubation period of dengue fever?

- ☐ 3–14 days
 - ☐ 1–12 days
 - ☐ 14–28 days
-

18. Which categories of patients with dengue fever should be admitted to hospital?

- ☐ Dengue without warning signs
 - ☐ Dengue without warning signs but with comorbidities
 - ☐ Dengue with warning signs
 - ☐ Severe dengue
-

19. Can dengue fever be prevented?

- ☐ Yes
 - ☐ No
-

20. Is a dengue vaccine available?

☐ Yes

☐ No

21. Can dengue fever be treated?

☐ Yes

☐ No

22. Which of the following are appropriate components of dengue management? (*Select all that apply.*)

☐ Intravenous fluid hydration

☐ Paracetamol

☐ Antibiotics

☐ Antiviral drugs

☐ Aspirin

☐ Non-steroidal anti-inflammatory drugs (NSAIDs)

☐ Corticosteroids

☐ Immunosuppressive drugs

☐ Platelet transfusion

☐ Plasma transfusion

☐ Whole blood transfusion

☐ Opioids

23. Which laboratory test is considered confirmatory for dengue infection?

☐ RT-PCR

☐ ELISA

☐ Dengue serology (IgM/IgG)

☐ Viral culture

☐ Complete blood count (CBC)

Section 3. Knowledge of Dengue Vector

24. Which of the following is an effective measure for preventing dengue transmission?

- ☐ Mosquito nets
 - ☐ Mosquito coils/mats
 - ☐ Mosquito repellents
 - ☐ Window or door screens
-

25. Have you ever seen the dengue mosquito?

- ☐ Yes
 - ☐ No
-

26. Which characteristics describe the dengue mosquito (Aedes spp.)?

- ☐ Small dark mosquito with white stripes on the legs
 - ☐ Lyre-shaped marking on the thorax
-

27. What causes dengue fever?

- ☐ Virus
 - ☐ Bacteria
 - ☐ Parasite
 - ☐ Mosquito
-

28. Where does the dengue mosquito usually breed?

- ☐ Flowing dirty water
- ☐ Flowing clean water
- ☐ Stagnant dirty water
- ☐ Stagnant clean water

29. Where does the dengue mosquito usually rest?

- ☐ Garbage
 - ☐ Under furniture
 - ☐ Sheltered places
 - ☐ Indoors
-

30. When does the dengue mosquito usually bite?

- ☐ Daytime
 - ☐ Sunset
 - ☐ Night
-

31. What is the primary mode of transmission of dengue fever?

- ☐ Bite of an infected *Aedes* mosquito
 - ☐ Bite of an infected *Anopheles* mosquito
 - ☐ Contact with an infected patient
 - ☐ Drinking contaminated water
 - ☐ Tick bite
 - ☐ Louse bite
-

Section 4. Attitudes Toward Dengue Prevention and Control

Please indicate your level of agreement with each statement.

Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree

- 32. The government is responsible for controlling dengue mosquitoes.
- 33. Dengue fever can be prevented and controlled.
- 34. I am adequately trained to manage patients with dengue fever.
- 35. Eliminating mosquito breeding sites is difficult and time-consuming.
- 36. Physicians play an important role in dengue prevention and control.

- 37. Dengue fever is a major public health problem.
 - 38. Dengue fever is difficult to diagnose.
 - 39. The environment in my area favors dengue transmission.
 - 40. Dengue fever is associated with high morbidity.
 - 41. Dengue fever should always be considered a serious clinical condition.
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Section 5. Clinical Practice, Guideline Familiarity, and Health-System Readiness

42. Are you familiar with the WHO dengue clinical management guidelines?

- ☐ Yes
 - ☐ No
-

43. Do you believe that the WHO dengue guidelines improve the clinical management of patients with dengue fever?

- ☐ Yes
 - ☐ No
-

44. Are adequate clinical resources available in your workplace to manage patients with dengue fever?

- ☐ Yes
 - ☐ No
-

45. If resources are inadequate, which of the following are lacking? *(Select all that apply.)*

- ☐ Training
 - ☐ Medications
 - ☐ Laboratory facilities
 - ☐ Clinical equipment
-

46. How often do you advise patients with dengue fever to avoid mosquito bites?

- ☐ Always

☐ Sometimes

☐ Never

47. When dengue fever is clinically suspected, how often do you request laboratory investigations?

☐ Always

☐ Sometimes

☐ Never

48. Which laboratory investigation do you most commonly request for patients with suspected dengue fever?

☐ Complete blood count (CBC)

☐ Dengue serology (IgM/IgG)

☐ Dengue RT-PCR

☐ Viral culture

49. How often do you prescribe paracetamol for patients with dengue fever?

☐ Always

☐ Sometimes

☐ Never

50. How often do you monitor complete blood count (CBC) in patients with dengue fever?

☐ Always

☐ Sometimes

☐ Never

Thank You

Thank you for your valuable participation.

Your responses will contribute to improving physician preparedness, implementation of WHO dengue guidelines, and dengue management in Sudan.