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OKRA WATER AS AN ADJUNCT IN GLYCAEMIC CONTROL: A QUASI-EXPERIMENTAL STUDY IN HOSPITALIZED TYPE 2 DIABETIC PATIENTS

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ABSTRACT

Background: Type 2 Diabetes Mellitus (T2DM) is a significant public health challenge worldwide. *Abelmoschus esculentus* (okra) contains soluble fibers, polysaccharides, and antioxidants that may help regulate blood glucose. This study evaluated the effectiveness of okra water in improving glycaemic control and symptom burden among hospitalized T2DM patients. **Methods:** A quasi-experimental one-group pretest–posttest design was conducted among 95 hospitalized T2DM patients aged 25–70 years in Tumkur, India. Participants consumed 200 mL of water infused overnight with three medium-sized okra pods each morning for 15 consecutive days. Fasting blood sugar (FBS), 1.5-hour postprandial blood sugar (PPBS), and Diabetes Impact Measurement Scale (DIMS) scores were assessed pre- and post-intervention. Paired *t*-tests were used for statistical analysis, with significance set at $p < 0.05$. **Results:** Mean FBS decreased from 165.3 ± 28.7 mg/dL to 148.7 ± 24.2 mg/dL ($t = 7.12$, $p < 0.001$), and PPBS from 198.6 ± 36.5 mg/dL to 175.9 ± 31.1 mg/dL ($t = 8.05$, $p < 0.001$). DIMS scores improved from 3.42 ± 0.34 to 3.18 ± 0.29 ($t = 6.01$, $p < 0.001$). **Conclusion:** Daily consumption of okra water significantly improved short-term glycaemic control and reduced symptom burden in hospitalized T2DM patients. It may serve as a safe, low-cost adjunct to conventional therapy, though longer-term randomized trials are recommended.

INTRODUCTION

Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterized by hyperglycaemia due to insulin resistance and β-cell dysfunction (American Diabetes Association, 2023). Globally, T2DM accounts for substantial morbidity, mortality, and healthcare expenditure. Conventional pharmacotherapy effectively reduces hyperglycaemia, but complementary approaches are increasingly investigated to enhance glycaemic control and improve quality of life (International Diabetes Federation, 2023).

Abelmoschus esculentus (okra) is a tropical plant rich in soluble fiber, pectin, polysaccharides, flavonoids, and antioxidants. These compounds can reduce postprandial glucose by delaying intestinal absorption, modulating enzymatic activity, and improving β-cell function (Ahmad et al., 2025; Tavakolizadeh et al., 2023). Clinical trials have demonstrated reductions in fasting blood glucose and HbA1c with okra supplementation (Mokgalaboni et al., 2023; Sohouli et al., 2024).

Despite promising evidence, most studies employ capsules, extracts, or powdered formulations for several weeks. Data on the efficacy of simple okra water preparations, especially over short-term interventions in hospitalized settings, are limited. This study aimed to evaluate the effectiveness of daily overnight-infused okra water in reducing glycaemic indices and symptom burden in hospitalized T2DM patients.

Aim: To assess the effect of daily okra water consumption for 15 days on FBS, PPBS, and DIMS scores in hospitalized T2DM patients.

Hypothesis: Daily consumption of okra water will significantly reduce FBS, PPBS, and symptom burden among T2DM patients.

MATERIALS AND METHODS

A quantitative, quasi-experimental one-group pre-testpost-testdesign was used. The study was conducted in the wards of

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Government District Hospital, Tumkur and in Sri Siddhartha Medical College Hospital, Tumkur.

Participants and Sampling: Ninety-five hospitalized T2DM patients aged 25–70 years were recruited using convenience sampling. Inclusion criteria were T2DM diagnosis ≥1 year, stable oral hypoglycaemic regimen, ability to consume orally, and willingness to participate. Exclusion criteria included insulin initiation during study, renal or hepatic impairment, pregnancy, gastrointestinal disorders, or known okra allergy.

Intervention: Participants consumed 200 mL of water infused overnight with three medium-sized okra pods on an empty stomach each morning for 15 days. Standard diabetic medications were continued unchanged. Compliance was monitored daily by nursing staff.

Outcome Measures: Fasting Blood Sugar (FBS) and 1.5-hour Postprandial Blood Sugar (PPBS) were measured using a standardized glucometer. Diabetes Impact Measurement Scale (DIMS): 30-item questionnaire (1 = severe impact; 6 = minimal impact) to assess symptom burden.

Ethical Considerations: Approval was obtained from the Institutional Ethics Committee (IEC No: SSMC/MED/IEC-002/Feb-2025). Written informed consent was collected from all participants, and confidentiality was ensured.

Statistical Analysis: Data were analyzed using SPSS 20. Descriptive statistics summarized demographics and clinical characteristics. Paired *t*-tests assessed pre-post changes in FBS, PPBS, and DIMS scores. A p-value < 0.05 indicated statistical significance.

RESULTS

Participant Characteristics

The mean age was 54.1 ± 9.5 years; 52% were male, 94% married, and 87% consumed a mixed diet. Duration of T2DM was 6–10 years for 42% of participants, and 89% were on metformin-based therapy.

Table 1. Demographic and Clinical Profile (n = 95)

Variable	Category	Frequency (%)
Age (years)	25–40	17 (18%)
	41–50	28 (29%)
	51–60	31 (33%)
	61–70	19 (20%)
Gender	Male	49 (52%)
	Female	46 (48%)
Duration of T2DM	≤5 yrs	21 (22%)
	6–10 yrs	40 (42%)
	>10 yrs	34 (36%)
Medication	Metformin + others	84 (89%)
Diet	Mixed	83 (87%)

Table 2. Glycaemic and Symptom Outcomes Pretest vs Post-test Outcomes (n = 95)

Parameter	Pretest Mean ± SD	Posttest Mean ± SD	t-value	p-value
FBS (mg/dL)	165.3 ± 28.7	148.7 ± 24.2	7.12	< 0.001***
PPBS (mg/dL)	198.6 ± 36.5	175.9 ± 31.1	8.05	< 0.001***
DIMS Score	3.42 ± 0.34	3.18 ± 0.29	6.01	< 0.001***

***Significant at p < 0.001

The results indicate that 15 days of daily okra water consumption significantly reduced FBS and PPBS and improved symptom burden among hospitalized T2DM patients.

DISCUSSION

This study demonstrates that short-term consumption of overnight-infused okra water can significantly improve glycaemic indices and reduce symptom impact in hospitalized T2DM patients. Observed reductions in FBS (~16.6 mg/dL) and PPBS (~22.7 mg/dL) are modest but clinically relevant for a 15-day intervention. Symptom burden, assessed by DIMS, also improved significantly, reflecting enhanced patient-perceived outcomes.

Mechanistically, soluble fibers and polysaccharides in okra delay carbohydrate absorption, modulate α-glucosidase activity, and protect β-cells from oxidative stress (Ahmad et al., 2025; Tavakolizadeh et al., 2023; Liao et al.,2019). Clinical studies have reported similar benefits using okra extract or powdered preparations (Mokgalaboni et al., 2023; Sohouli et al., 2024; Zhang et al., 2024; Saatchi et al., 2022). The present study adds evidence that a simple dietary form, easily integrated into daily routines, can exert measurable short-term effects.

Strengths include hospital-based monitoring ensuring high compliance, standardized outcome measurements, and use of validated tools. Limitations involve the absence of a control group, short intervention duration, and reliance on glucometer readings instead of laboratory assays. Future RCTs with placebo-controlled groups, longer durations, and biomarker assessments (HbA1c, insulin, oxidative stress markers) are warranted.

CONCLUSION

Overnight-infused okra water administered daily for 15 days significantly improved FBS, PPBS, and DIMS scores in hospitalized T2DM patients. It is a safe, low-cost, and culturally acceptable adjunct to standard diabetes care. Longer-term randomized studies are recommended to validate these findings and establish optimal dosing.

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Conflict of Interest

None declared.

Ethical Approval

Institutional Ethics Committee, Sri Siddhartha College of Nursing, Tumkur (IEC No: SSMC/MED/IEC-002/Feb-2025). Written informed consent obtained from all participants.

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