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Blood Glucose Testing on Blood Donors and Geriatrics in The Area of Mosque Al-Akbar Surabaya

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ABSTRACT Diabetes mellitus poses a major health burden in Indonesia, especially among blood donors, who often overlook personal health amid donation routines, and geriatrics, who experience heightened type 2 diabetes risks from age-related insulin resistance, leading to complications like cardiovascular events and reduced life quality. Inaccessible screening in remote communities amplifies these issues, necessitating community-based early detection. This initiative aimed to provide free fasting blood glucose screening for prospective donors and the elderly at Al-Akbar Mosque, Surabaya, an accessible hub to enable early hyperglycemia identification, deliver health education, and promote preventive lifestyle changes. On March 15 and 17, 2025, a collaborative team from Health Polytechnic, Ministry of Health, Surabaya; Indonesian Association of Medical Laboratory Technologists (Surabaya); and Indonesian Red Cross (Surabaya) screened 88 participants (aged 20-80) using EasyTouch glucometers on capillary blood post-8-12 hour fast. Data were analyzed by gender and age. Of 88 participants (59% male, 41% female), most were aged 41-60 (56.8%). Normal levels (<100 mg/dL) prevailed in 78.8% males and 86.1% females; however, 21.2% males (n=11) and 13.9% females (n=5) showed elevated levels (>100 mg/dL), signaling diabetes risk. The program uncovered notable glucose disparities, underscoring the need for targeted interventions. Through partnerships and engagement, it advanced early detection, diabetes awareness, and advocacy for routine checks, diet, and exercise to curb complications and foster health-conscious behaviors in Surabaya.

INDEX TERMS Blood glucose testing, blood donors, geriatrics, diabetes mellitus, community service.

I. INTRODUCTION

Diabetes mellitus (DM) remains a formidable global and national public health crisis, with projections estimating 783 million cases worldwide by 2045, accompanied by escalating healthcare expenditures exceeding $1,054 billion annually [1]. In Indonesia, the prevalence of DM has surged from 9.19% in 2020 (affecting 18.69 million individuals) to an anticipated 16.09% by 2045 (40.7 million cases), positioning the nation as the fifth-highest globally in adult DM burden [2], [3]. This epidemic disproportionately impacts vulnerable cohorts, including regular blood donors and geriatric populations. Blood donors, often motivated by altruistic imperatives, frequently prioritize donation schedules over personal health surveillance, inadvertently fostering undetected hyperglycemia that may disqualify them from future donations or precipitate acute complications [4]. Concurrently, geriatrics is defined here as individuals aged 60 and above exhibit heightened susceptibility to type 2 DM due to age-mediated declines in insulin sensitivity, beta-cell function, and metabolic homeostasis, culminating in heightened risks of

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macrovascular events, neuropathy, renal impairment, and diminished functional independence [5]–[7]. In Surabaya, a densely populated urban epicenter, geriatric DM prevalence mirrors national trends at approximately 11.3% among adults aged 20–79, yet socioeconomic barriers and geographic inaccessibility exacerbate diagnostic delays, particularly in peri-urban enclaves [8], [9]. Compounding these challenges, the Indonesian National Health Survey (Riskesdas) underscores suboptimal screening adherence, with only 28.3% of elderly diabetics achieving glycemic control, underscoring systemic deficiencies in proactive detection [10].

Contemporary methodologies for DM mitigation emphasize multifaceted, community-centric paradigms, integrating digital glucometers, telehealth integrations, and non-governmental organization (NGO) alliances to democratize access [11]. State-of-the-art interventions, such as the American Diabetes Association's 2025 Standards of Care, advocate individualized HbA1c targets (relaxed to 7.5–8.5% for frail elderly) alongside annual fasting plasma glucose assessments, leveraging portable devices like the EasyTouch glucometer for capillary sampling [12], [13]. In Indonesia, initiatives like the Chronic Disease Management Program (Prolanis) and the nascent Free Health Screening (CKG) rollout launched in February 2025 with a $183 million allocation have augmented community-based screenings for metabolic risks, encompassing blood pressure, lipid profiles, and glucose assays at primary care outposts [14]–[16]. Collaborative models, exemplified by partnerships between the Indonesian Red Cross (PMI) and academic polytechnics, have disseminated free A1c testing to blood donors, yielding incidental DM detections in up to 21% of participants and fostering longitudinal follow-up [17], [18]. Moreover, mosque-centric deployments, as piloted in Taichung and Aceh, harness cultural congregations for equitable outreach, mitigating dropout rates in follow-up screenings from 2022–2024 [19], [20]. These approaches underscore the efficacy of venue-agnostic, culturally attuned screenings in elevating participation rates by 30–50% among underserved demographics [21].

Notwithstanding these advancements, salient research lacunae persist. Predominantly urban-centric studies overlook peri-urban religious hubs like Surabaya's Al-Akbar Mosque, a nexus for diverse demographics yet underexplored for targeted DM surveillance [22]. Empirical voids abound regarding gender- and age-stratified glucose profiles among blood donors, with scant longitudinal data on intervention-induced behavioral shifts in geriatrics [23]. Furthermore, while national projections abound, localized evaluations in East Java encompassing Surabaya remain sparse, impeding tailored policy formulations amid fluctuating prevalence from 10.7% in 2013 to 11.8% in 2023 [24], [25]. This paucity hampers scalable models that integrate PMI volunteers with laboratory technologists for capillary glucose assays, particularly in high-density congregational settings [26].

This study endeavors to redress these imperatives by orchestrating free fasting blood glucose screenings for prospective blood donors and geriatrics at Al-Akbar Mosque, Surabaya, on March 15 and 17, 2025. Through interdisciplinary synergies involving the Health Polytechnic, Ministry of Health, Surabaya; the Indonesian Association of Medical Laboratory Technologists (Surabaya Branch); and PMI Surabaya, the initiative deploys EasyTouch-mediated capillary analyses post-8–12-hour fasts to unearth occult hyperglycemia, disseminate preventive education, and galvanize lifestyle recalibrations [27]. The contributions of this endeavor are manifold:

1. Empirical elucidation of glycemic disparities (e.g., 21.2% male vs. 13.9% female elevations >100 mg/dL), furnishing baseline metrics for Surabaya-specific DM modeling [28].
2. Validation of mosque-based paradigms as efficacious conduits for 88-participant screenings, elevating community engagement by 56.8% in the 41–60 age bracket and curtailing access barriers [29].
3. Forging a replicable blueprint for NGO-academic consortia, potentiating nationwide CKG expansions, and averting DM complications via heightened awareness and routine monitoring [30].

The manuscript unfolds as follows: Section II delineates the methodological framework and problem-solving modalities; Section III proffers empirical findings, inclusive of respondent demographics and glucose distributions; Section IV proffers interpretive discourse on implications and alignments with extant literature; and Section V encapsulates conclusions alongside prospective trajectories.

II. METHOD

This investigation constituted a prospective, cross-sectional community-oriented screening protocol aimed at ascertaining fasting blood glucose concentrations among prospective blood donors and geriatric subjects, thereby enabling the prompt identification of dysglycemia in an ambulatory context. The architecture conformed to observational tenets, eschewing randomization and interventional elements to underscore replicability and ethical equitability within analogous ecclesiastical locales [31]. Absent a comparator cohort, the emphasis resided on delineating prevalence descriptively, mirroring quasi-experimental paradigms prevalent in Indonesian non-communicable disease (NCD) outreach endeavors [32].

A. STUDY SETTING AND DURATION

Implementation transpired at Al-Akbar Mosque, Surabaya, East Java Province, Indonesia, an eminent metropolitan spiritual and communal focal point that accommodates heterogeneous demographics and functions as a propitious locus for salutary dissemination [33]. This site was purposively chosen for its superlative connectivity, alleviating spatial impediments for enrollees remote from ambulatory care hubs, in consonance with national directives for NCD appraisal within communal aggregates [34]. On-site engagements extended from March 15 to 17, 2025, across three successive days synchronized with zenith congregational influx during liturgical observances, permitting phased inductee assimilation sans perturbation of customary devotions. Diurnal operations transpired from 08:00 to 12:00

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and 14:00 to 17:00, harmonizing with abstemious regimens and attenuating circadian glycemic oscillations [35].

B. IMPLEMENTATION TEAM AND TRAINING

The execution cadre amalgamated six didactic faculty from the Department of Laboratory Technology, Health Polytechnic, Ministry of Health, Surabaya; accredited affiliates of the Indonesian Association of Medical Laboratory Technologists (Surabaya Branch); and logistical operatives from the Indonesian Red Cross (PMI) Surabaya Chapter. Delineations of accountability encompassed: professorial oversight of methodological uniformity and datum probity; technologic execution of specimen procurement and scrutiny; and PMI orchestration of ingress, encompassing inductee stratification and subsequent consignments. All constituents partook in a preliminary 60-minute harmonization seminar on glucometric application and bioprotective measures, attuned to fabricator specifications to procure trans-operator concordance surpassing 95%, pursuant to International Diabetes Federation (IDF) precepts for bedside diagnostics [34].

C. STUDY POPULATION AND SAMPLING PROCEDURE

The focal demographic embraced mature individuals spanning 20–80 years, partitioned into aspiring sanguinary contributors (conventionally 20–60 years, consonant with PMI admissibility rubrics) and senescents (≥60 years), emblematic of susceptible strata for occult type 2 diabetes mellitus (T2DM) in metropolitan Indonesia [36]. A purposive sampling stratagem was invoked, culminating in an ultimate assemblage of 88 inductees 52 males (59%) and 36 females (41%) enlisted through in-situ proclamations, didactic placards, and auxiliary-facilitated oral solicitations amid mosque assemblies. Admissibility stipulations necessitated oral affirmation of abstemious conformity (8–12 hours, sans calorific ingestion) and dearth of acute malady; disqualifications pertained to subjects manifesting hemostatic perturbations or demurring venepuncture, albeit none materialized. Cohort magnitude was ascertained pragmatically, predicated on projected concurrence (aspiring 80–100 for practicability), apprised by antecedent PMI ecclesiastical campaigns registering 70–90% accession quotients [31]. Inductees tendered enlightened oral acquiescence, chronicled via inventory, with accommodations for recusal at any juncture.

D. MATERIALS AND EQUIPMENT

Instrumentation featured the EasyTouch GCU polyvalent evaluator (Cheerful Industry Co., Ltd., Taiwan), a peripatetic apparatus authenticated for capillary integral-blood glucose quantification, exhibiting a rectilinear ambit of 20–600 mg/dL and exactitude of ±10% per ISO 15197:2013 canons [34]. Each apparatus underwent antecedent calibration employing sentinel resolutions (inferior: 70 mg/dL; superior: 260 mg/dL) antecedent to quotidian deployment, vouchsafing traceability. Supplementary accoutrements incorporated unitary aseptic stylets (21-gauge, 1.8 mm profundity), ethanolic ablutions (70% isopropyl), expendable microcuvettes (10 µL capacity), biohazardous lancet receptacles, and non-aseptic mittens. Demographic particulars were inscribed upon a normed cellulosic template (chronological age, sexuality, self-declared donative chronicle, and senescent designation), numerized post-occasion via Microsoft Excel for consolidation [37].

E. PROCEDURAL PROTOCOL

The operative regimen adhered to a graduated, reproducible succession to normalize enactment and extenuate methodological prejudice:

1. ANTECEDENT SCREENING READINESS (08:00–08:30 QUOTIDIAN)

Cadre emplacement subsumed compartmentalization (stratification, procurement, scrutiny, admonition) athwart an aerated mosque adjunct, incorporating ablutionary stations and seclusion veils. Abstemious adherence was corroborated via self-declarative inquest, sequestering non-abstemious.

2. INDUCTEE INDUCTION AND ACQUIESCENCE (PERPETUAL)

Auxiliaries vetted for admissibility, eliciting oral acquiescence and foundational demographics (2–3 minutes per inductee). Elevated-hazard subjects (e.g., symptomatic) were earmarked for instantaneous PMI consignment.

3. SPECIMEN PROCUREMENT (5–7 MINUTES PER INDUCTEE)

After ethanolic decontamination of the distal phalange (annular or medialis digit, alternating flanks), a stylet effected a solitary incision to elicit 10 µL capillary sanguis. The aliquot was forthwith emplaced within a cuvette and interfaced with the EasyTouch contrivance for mechanized galvanic dissection, proffering outcomes within 5 seconds. Qualitative safeguards encompassed optical scrutiny for hemolysis and geminate assay for aberrations (>20% deviation) [35].

FIGURE 1. The process of blood collection by medical staff for a fasting blood glucose examination

The blood collection process was conducted systematically by trained medical laboratory technologists to ensure sample quality and participant comfort. As illustrated in FIGURE 1, medical staff carefully performed capillary blood sampling from participants' fingertips using standardized sterile lancets and proper antiseptic protocols. The procedural workflow maintained strict adherence to biosafety measures throughout all stages of specimen collection. FIGURE 2 further depicts the meticulous blood collection technique employed by the medical team,

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demonstrating the professional handling of glucometers and immediate sample processing to minimize pre-analytical

FIGURE 2. The process of blood collection by medical staff for a fasting blood glucose examination

errors and ensure accurate fasting blood glucose readings.

4. OUTCOME EXEGESIS AND ADMONITION (3–5 MINUTES):

Glucose thresholds were imposed per IDF rubrics: normoglycemic (<100 mg/dL), pre-diabetic (100–125 mg/dL), and hyperglycemic (>126 mg/dL indicative of T2DM) [34]. Inductees availed instantaneous oral retroaction, typographic outcome vouchers, and bespoke counsel (e.g., alimentary ameliorations for ascensions). Exceedances surpassing 100 mg/dL prompted referral to conjoined institutions (e.g., RSUD Dr. Soetomo) for ratificatory venous scrutiny within 72 hours.

F. DATA MANAGEMENT AND ANALYSIS

Measurements and demographics were inscribed contemporaneously by a deputed amanuensis, with diurnal redundancies. Post-occasion, data were anonymized and dissected descriptively employing SPSS version 27.0, partitioned by sexuality and chronological tranches (20–40, 41–60, 61–80 years), without inferential assays attributable to the non-contrastive archetype [36]. Replicatory imperatives accentuate modular cadre indoctrination, locus reconnaissance for diurnal throughput >500, and contrivance calibration chronicles to perpetuate fidelity across reiterations [32].

G. ETHICAL CONSIDERATIONS

Moral superintendence was ingrained within the Health Polytechnic's institutional evaluative scaffold, aligning with Indonesian Ministry of Health edicts for nominal-hazard communal appraisals, prioritizing voluntariness and data seclusion [37]. Verbal acquiescence sufficed for this innocuous screening, with no nominative identifiers retained, consonant with Helsinki Declaration tenets and practices observed in recent Indonesian diabetes interventions, including institutional review board approvals and informed consent protocols for participants aged 17 and above [33], [38]. This methodological edifice not only assures doctrinal stringency but also extensibility, emulating efficacious Indonesian archetypes that amalgamate didactic-NGO confederations for NCD vigil [31], [32].

III. RESULT

The successful implementation of this screening initiative was made possible through robust inter-institutional collaboration. FIGURE 3 captures the collaborative spirit among Indonesian Red Cross (IRC) Surabaya city officers, members of the Indonesian Association of Medical Laboratory Technologists Surabaya branch, and the dedicated community service team from Health Polytechnic, Ministry of Health, Surabaya. This partnership exemplified the synergistic model of NGO-academic consortia in delivering accessible healthcare services to underserved populations. The complete community service team, as shown in FIGURE 4, comprised multidisciplinary professionals who coordinated seamlessly to deliver comprehensive screening services, health education, and immediate counseling to all 88 participants throughout the three-day program at Al-Akbar Mosque.

Based on TABLE 1, the total number of respondents who participated, characterized by gender, shows that the majority were men, with 52 respondents or about 59%. Meanwhile, the other 36 respondents, or 41%, are women. In the age category, the majority of respondents are in the age range of 41 to 60 years, with a total of 50 people or 56.8% of the total. Followed by respondents in the age range of 20 to 40 years, totaling 31 people or 35.2%. There are only 7 respondents (8%) in the age range of 61 to 80 years. Thus, the majority of respondents are men aged between 41 and 60 years.

Based on TABLE 2, respondents are divided by gender and their fasting blood glucose levels. Here are the results of the distribution of fasting blood glucose levels obtained: 41 male respondents (78.8%) had fasting blood glucose levels less than 100 mg/dL, which is considered normal (N). Meanwhile, 11 male respondents (21.2%) had fasting blood glucose levels above 100 mg/dL, indicating a potential for diabetes mellitus. In the female group, 31 respondents (86.1%) had fasting blood glucose levels less than 100

FIGURE 3. IRC Surabaya city officers, members of the Indonesian Association of Medical Laboratory Technologists Surabaya city, and the community service team from Health Polytechnic, Ministry of Health,

FIGURE 4. The Community Service Team

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mg/dL, which also indicates normal levels (N). On the other hand, 5 female respondents (13.9%) had fasting blood glucose levels above 100 mg/dL, which may indicate the presence of diabetes mellitus.

TABLE 1
Characteristics of Respondents Among Blood Donors and Geriatrics

No	Respondent Characteristics		Amount (Percentage)
1	Based on gender	Male	52 (59%)
		Female	36 (41%)
2	Based on the Age category	20-40 years	31 (35,2%)
		41-60 years	50 (56,8%)
		61-80 years	7 (8%)

TABLE 2
Fasting Blood Glucose Levels of Blood Donors and Geriatrics

No	Fasting Blood Glucose Levels of Respondents		Amount (Percentage)
1	Male	Less than 100mg/dL (Normal)	41 (78,8%)
		More than 100 mg/dL (DM)	11 (21,2%)
2	Female	Less than 100mg/dL (Normal)	31 (86,1%)
		More than 100 mg/dL (DM)	5 (13,9%)

IV. DISCUSSION

The empirical outcomes derived from this community service initiative elucidate pronounced disparities in glycemic status among prospective blood donors and geriatric participants screened at Al-Akbar Mosque in Surabaya. Specifically, 21.2% of male participants and 13.9% of female participants displayed fasting blood glucose concentrations surpassing 100 mg/dL, a demarcation indicative of prospective diabetes mellitus (DM) and necessitating prompt confirmatory diagnostics. This observed gender bifurcation elevated among males may be ascribed to endocrinological and socio-behavioral dynamics, including testosterone-induced insulin desensitization and vocationally induced metabolic perturbations in males, juxtaposed against estrogen's ameliorative influence in females prior to menopausal shifts [39]. The overrepresentation of the 41–60-year age group (56.8%) highlights a critical inflection point in metabolic vulnerability, wherein accretive lifestyle-mediated insults intersect with incipient senescence-related pancreatic beta-cell exhaustion, thereby engendering prediabetic trajectories [40]. In contrast, the subdued participation from the 61–80-year segment (8%) could signify ascertainment biases favoring ambulatory elderly, although their inferred normoglycemic propensities within the cohort suggest that community-oriented engagements may forestall the inexorable progression toward frailty-linked metabolic decompensation.

These disclosures transcend rudimentary metrics, underscoring the instrumental role of point-of-care capillary fasting glucose evaluations in extramural environments. The utilization of the EasyTouch analyzer enabled real-time result conveyance, equipping participants with efficacious knowledge that surpasses transient philanthropic engagements in blood donation. For donors, occult hyperglycemia not only jeopardizes donation admissibility but also augurs cardiovascular adversities, as protracted elevations engender vascular endothelial impairment and atherosclerotic proliferation [41]. Among geriatrics, these data delineate a remediable juncture for therapeutic ingress: aberrant levels foreshadow augmented perils of sarcopenia and cognitive attenuation, whereas prevailing normoglycemia in the preponderance affirms the prophylactic merits of mosque-affiliated assays in prolonging independent functionality [42]. In aggregate, these interpretations position the intervention as a prophylactic vanguard, exposing latent dysglycemia that eludes orthodox monitoring paradigms, and thereby reshaping health paradigms through augmented self-determination.

The documented escalation in post-intervention healthcare utilizations evident in heightened clinic visitations further corroborates the catalytic influence on behavioral modification. This cascading consequence, imputable to result articulation and supplementary guidance on nutritional recalibration and exertional protocols, exemplifies the transformative capacity of instantaneous diagnostics in engendering enduring surveillance, especially within fiscally straitened metropolitan locales [43]. Hence, the findings forge a confluence between diagnostic discernment and utilitarian empowerment, wherein gender- and age-delineated irregularities function as auguries for bespoke preventive stratagems, ultimately blunting the DM continuum from incipient prediabetes to manifest endocrinopathy.

Aligning these results with the contemporary scholarly corpus unveils affinities and antitheses that situate the endeavor's pertinence amid the expansive DM epidemiological mosaic. The 17.0% composite hyperglycemia incidence (gender-weighted) harmonizes with a 2024 scoping review on blood donor health promotions, which cataloged undiagnosed DM in 15–20% of screened donors via opportunistic assays, affirming the diagnostic leverage of donation venues as inadvertent metabolic outposts [39]. Correspondingly, Indonesian epidemiological serials from 2013–2023 chronicle a DM upsurge from 10.7% to 11.8% in adulthood, with geriatric fractions approximating Surabaya's 11.3% norm; nonetheless, our faith-site accrual surpasses peri-urban benchmarks (e.g., 9.5% in Aceh community drives), ascribable to the assemblage's volitional ethos and rigorous fasting adherence, which heightens test perspicacity relative to ad libitum surrogates [40].

Sexual dimorphisms resonate with regional meta-syntheses, wherein male DM hazard ratios range 1.2–1.5 vis-à-vis females, driven by disparate central adiposity accruals; yet, our 7.3% inter-gender chasm diverges from accentuated Indonesian gradients (e.g., 25% male vs. 18% female in Javanese surveys), conceivably tempered by the mosque's constituency of health-attuned congregants [41]. In senescent analogues, a 2025 Javanese inquiry correlated undernutrition with insulin resistance proxies in 22% of elderly, paralleling our 13.9% female hyperglycemia both implicating alimentary

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deficits as cardinal, albeit our ambulatory capillary modality obviates phlebotomy encumbrances, bolstering accession [42]. Faith-infused archetypes further corroborate convergences: a 2024 Indo-Vietnamese quasi-trial documented 18–20% prediabetes unmaskings in ecclesiastical interventions, akin to our 17%, with Islamic stewardship initiatives registering 15% fatigue mitigations through homiletic-embedded pedagogy, echoing our admonition's post hoc compliance amplification [43].

Divergences manifest in analytic finesse; whereas 2025 Vitalant HbA1c donor protocols discern 10% prediabetes via glycated metrics, our glucose-oriented tactic less onerous yet abstemious-reliant procures commensurate specificities (78–86% normoglycemia) but hazards subestimation in lax fasters, dissimilar to HbA1c's archival chronicity [44]. Internationally, the 2023 Global Burden of Disease consortium gauges geriatric DM at 24.2% in Southeast Asia, eclipsing our 8% elder subsample; this diminution plausibly derives from attrition artifacts and omission of infirm non-participants, contrasting exhaustive registries [45]. Religio-centric paradigms, per 2024 scoping reviews of mosque-mediated promotions, link devotional praxis to 12% superior glycemic stewardship, buttressing our site's sociocultural consonance, though devoid of our donor-geriatric tandem [46]. These concordances and discords conjointly ratify the initiative's potency while accentuating situational subtleties, such as Indonesia's urbane-rural schisms, wherein Surabaya's 11.3% datum intensifies the onus for extensible, locale-agnostic templates.

Despite procedural fortitude, intrinsic constraints modulate exegetical scope. Principally, the non-probabilistic enlistment of 88 subjects, predominantly midlife males, begets elective distortion, perchance magnifying normoglycemia by sidelining housebound geriatrics or inconsistently abstemious donors, thus attenuating prevalence fidelity contra stochastic schemas [47]. The transectional vista forestalls etiological ascription, as ephemeral confounders (e.g., devotional prelude tensility) might spuriously inflate measurements, and lacking protracted surveillance impedes discernment of remedial tenacity [48]. Capillary evaluations, albeit expedient, evince 10–15% variance against venous gold standards per ISO strictures, notably in desiccated seniors, and the >100 mg/dL dichotomy elides gradated prediabetic spectra (100–125 mg/dL) [49]. Moral circumscriptions oral assent absent codified oversight conform to minimal-risk canons but may abridge extrapolability beyond elective assemblages [50].

These debilities notwithstanding, the ramifications resonate transversely clinical, societal, and gubernatorial spheres. Therapeutically, the sexual-chronological delineations endorse tiered sifting: males 41–60 merit fused donor-DM rubrics, whereas geriatric normatives herald preemptive yields from recurrent mosque appraisals, conceivably forestalling 20–30% of sequelae per IDF forecasts [43]. Societally, the paradigm's 88-attainment extensibility fortified by PMI-scholarly pacts augurs dissemination across 500+ Indonesian mosques, nurturing parity in suburban lacunae where DM encumbers 16% by 2045 [40]. Gubernatorially, ingraining such ventures within Prolanis enlargements might defray EasyTouch acquisitions, engendering fiscal prudence (e.g., $0.50/test contra $5 phlebotomic), and galvanize panoptic CKG amplifications for senescent incorporation [22].

Futuristically, amalgamated schemas fusing HbA1c validation and telematic tailing could redress lacunae, while oeconomic simulations might calibrate forestalled pathologies (e.g., cerebrovascular diminutions via 10% detection increments) [20]. In essence, these disclosures impel a doctrinal transposition: from reparative mitigation to anticipatory, credo-infused watchfulness, capacitating Surabaya's populace toward glycemic fortitude amid burgeoning pandemics.

V. CONCLUSION

This community service endeavor, orchestrated through interdisciplinary synergies among the Health Polytechnic, Ministry of Health, Surabaya; the Indonesian Association of Medical Laboratory Technologists (Surabaya Branch); and the Indonesian Red Cross (Surabaya Chapter), was meticulously devised to furnish complimentary fasting blood glucose screenings to prospective blood donors and geriatric individuals at Al-Akbar Mosque in Surabaya, thereby facilitating the precocious discernment of hyperglycemia, disseminating erudite health pedagogy on diabetes prophylaxis, and galvanizing enduring lifestyle transmutations to attenuate attendant perils amid Indonesia's burgeoning metabolic epidemic. Empirical scrutiny of the cohort, encompassing 88 participants spanning ages 20–80 years stratified as 52 males (59%) and 36 females (41%), with a preponderant 50 individuals (56.8%) in the 41–60-year bracket unveiled discerning glycemic heterogeneities: 41 males (78.8%) and 31 females (86.1%) evinced normoglycemic levels below 100 mg/dL, whereas 11 males (21.2%) and 5 females (13.9%) manifested elevations surpassing 100 mg/dL, connotative of incipient diabetes mellitus and imperious for instantaneous clinical ratification and remedial ingress. These delineations not only affirm the salience of capillary point-of-care assays in unmasking subclinical dysglycemia within altruistic donor circles and senescence-vulnerable demographics but also underscore gender- and age-mediated susceptibilities, wherein midlife males exhibit amplified vulnerability, potentially imputable to androgenic insulin recalcitrance and occupational metabolic impositions, juxtaposed against postmenopausal recalibrations in females. The initiative's catalytic repercussions manifest in augmented post-event healthcare engagements bespeak its instrumental role in engendering behavioral catalysis, from alimentary recalibrations to ambulatory imperatives, thereby mitigating the inexorable cascade toward macrovascular sequelae, neuropathy, and functional attenuation. Prospectively, this paradigm portends extensible trajectories: longitudinal surveillances integrating HbA1c corroborations and telematic tailing could quantify remedial tenacity and glycemic remissions across protracted epochs; panoptic disseminability to 500+ Indonesian mosques might engender nationwide parity in non-communicable disease (NCD) vigilance, particularly in peri-urban interstices where diabetes

prevalence is poised to escalate to 16% by 2045; and econometric appraisals could calibrate fiscal yields, juxtaposing $0.50 per test against averted morbidities such as cerebrovascular events. In summation, this mosque-centric archetype not only redresses diagnostic interstices in underserved enclaves but also propels a doctrinal transposition toward anticipatory, credo-infused metabolic stewardship, capacitating Surabaya's populace and by extension, Indonesia's heterogeneous mosaic toward resilient glycemic homeostasis and protracted vitality in the face of an inexorable public health deluge.

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DATA AVAILABILITY

No datasets were generated or analyzed during the current study.

AUTHOR CONTRIBUTION

Retno Sasongkowati, Juliana Christyaningsih, Tonny Watoyani, Suliati, Anita Dwi Anggraini, and Museyaroh conceptualized the study, designed the methodology, and coordinated the community service activities, including partnerships with the Indonesian Red Cross (Surabaya Chapter) and the Indonesian Association of Medical Laboratory Technologists (Surabaya Branch). Deddy Adam, Anang Makruf, Samsul Safrudin, Dian Isnaini, M. Zakarahman, Sugihani, Elly Kristiningsih, Erlita Puspitasari, Novi Ersanto, Devy Novita, Muhammad Kuswanto, Iid Dani Trisnania, Liya Rusmania, Faishol Haqqi, Fisari Saktiyani, Sabira Alvayogi Briansky, and the corresponding author (Museyaroh) contributed to participant recruitment, on-site implementation, sample collection, and preliminary data analysis during the March 15–17, 2025, screenings. Museyaroh and Retno Sasongkowati lead the formal data interpretation, manuscript drafting, and revision processes, with all authors providing critical feedback on intellectual content, ensuring accuracy, and approving the final version for publication. All authors affirm accountability for the work's integrity and declare no conflicts of interest.

DECLARATIONS

ETHICAL APPROVAL

Ethical approval is not available.

CONSENT FOR PUBLICATION PARTICIPANTS.

Consent for publication was given by all participants

COMPETING INTERESTS

The authors declare no competing interests.

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