Equity, diversity and inclusivity in nutrition research: Remediating metabolic health with *Syzygium cumini* (Linn) and its bioactive compounds

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Abstract

Equity, diversity and inclusivity (EDI) are critical in nutrition and health research, for scientific advancements and general benefits. *Syzygium cumini* (Jamun) is a traditional medicinal plant with phytochemicals and bioactive compounds for managing metabolic challenges (diabetes-mellitus, cardiovascular diseases, hypertension, cancer, obesity, dyslipidaemia, inflammation and the likes). The efficacy of Jamun includes its antioxidant, anti-inflammatory, and insulin-sensitizing potentials to remediate metabolic burden of general population especially those disadvantaged by sociodemographic factors. Most researches on Jamun concentrated on indigenous Asian populations while research on bioactive compounds often lacks representative participation and equal access by diverse ethnicity. Gaps in translating research findings to diverse populations, underscores inclusive methodologies to connect traditional medicine with modern science. It was concluded that employing EDI principles in nutraceutical management of metabolic disorders across socio-demographic groups would enhance Jamun's relevance and democratise its health benefits. This paper aligns with global promotion of EDI in health research while focusing the underutilised potentials of *Syzygium cumini* in remediating metabolic challenges across various demographics. Focus on culturally relevant dietary interventions would promote equitable access to functional indigenous recipes and commercial nutrition programmes with scientifically validated innovations in future studies. It was thus suggested that inclusive clinical trials on proposed research subjects should strategize to ensure that findings are relevant and beneficial to all communities. It advocated for funding and support to translate research on indigenous knowledge to benefit communities where underutilized resources originated as culturally tailored intervention.

Keywords: Bioactive compounds, Equity, Diversity, Inclusivity in nutrition, Metabolic health.

Word Counts: 245

Introduction

Equity is an intentional effort to include variety of perspectives from different populations, incorporate wide range of experiences and diverse backgrounds in research to foster equal access to opportunities, resources and equitable outcomes for all individuals and communities. Equity focuses on addressing health disparities and it is actually intended to ensure fair treatment, just opportunities, unrestricted access and advancement of optimal health for everyone. Diversity considers biological, sociocultural and sociodemographic differences and proposes that representation cut across various backgrounds of race, gender, age and experiences with no disparities in disability of any type (physical, mental, emotional) in order to ensure relevance of findings to a broader population. According to the International Encyclopaedia of Education, "Inclusivity refers to the efforts and practices of creating conducive research environment and processes that is accessible to all and which takes cognisance of diverse background compositions of age, race, ethnicity, religion, gender, socioeconomic among others" (Tan, 2019).

Metabolic disorders such as diabetes mellitus, obesity, malnutrition, hypertension, cancer, are global health crisis having inequitable impacts on different categories of people and disproportionate impacts on some marginalized communities. Metabolic diseases affect people worldwide, with socioeconomic, geographic, and cultural factors creating disparities in prevention and access to treatment. The 2024 conference theme of the Nutrition Society (Food for All); emphasized that equitable nutrition research must address disparities using inclusive approaches and interventions to reduce metabolic disorders among other related chronic health challenges while meeting social relevance, and scientific efficacy (World Health Organization (WHO), 2020). Nutrition research has traditionally focused on broad population averages, while often neglecting specific needs of groups within the study areas thus resulting in health disparities while dietary recommendations may not be applicable to all populations (Martin *et al*., 2023).

The role of plant-based bioactive compounds like anthocyanins, polyphenols, ellagic acid, jambosine and the likes in metabolic health cannot be over-emphasised. *Syzygium cumini* L. (Jamun) of the Myrtaceae family is a significant, bioactive-rich age-long remedy native to the sub-continent of Asia, India and Pakistan. *Syzygium cumini* also known as jamun, jambolana, java plum or black plum, is a tropical fruit-bearing tree that is now cultivated globally in warm climates and tropical regions of the world (Sharma *et al*., 2020). All the parts of the plant including fruits, seeds, leaves, and tree bark have documented medicinal benefits. The fruits are rich in anthocyanins (delphinidin, petunidin, malvidin), flavonols (myricetin, quercetin), and phenolic acids (gallic, ellagic). The seeds contain jambosine, alkaloids, and glycosides with anti-hyperglycaemic effects. The leaves provide essential oils and flavonoids. Traditional uses of Jamun in folk medicine across Indian, Pakistani, Sri Lankan, and Brazilian include diabetes management, dysentery treatment, and cardiovascular protection which underscores its significance as a culturally embedded health resource (Qamar *et al.,* 2022).

The highly foliaceous evergreen tree of *Syzygium cumini* has thick durable wood which is strong and water-resistant for making furniture while the tree bark produces brown dye and tannins for leather and fishing nets (Kumar *et al*., 2022). The flowers have abundant nectar and are visited by bees (*Apis dorsata*) for honey production, while essential oil distilled from the leaves is used to scent soap or blended with other materials in making perfume. Jamun is a multipurpose plant with wide and diverse uses as ornamental, medicinal and edible plant and requires high quality seedlings for its cultivation. In India, the cultivation is so huge that the annual output ranks second; contributing 15.4% of 13.5 million tons (global output) (Hameed *et al.,* 2020). Jamun is well-regarded for its edible and medicinal properties; the fruit is used for curing diarrhoea and also as a general tonic for the liver. Several other medicinal uses attributed to the fruit include; enriching the blood, strengthening teeth and gums, curing bilious diarrhoea, as sore throats gargle, and as cure

lotion for ringworm (Srivastava *et al.,* 2022). The seeds of Jamun are also reported to be diuretic; to stop urinary discharges and used in the treatment of diabetes, diarrhoea and dysentery.

Meanwhile, nutrition research has historically underrepresented diverse populations, leading to a gap in knowledge regarding the metabolic health challenges faced by various ethnic groups. This inequity resorts to potential limitations of such study in terms of sample size or geographic constraints and the development of inclusive dietary recommendations for peculiar interventions. Additionally, the potential benefits of traditional food sources, such as *Syzygium cumini* (Linn), and its bioactive compounds remain underexplored in addressing metabolic diseases beyond its immediate environment and across other populations. There is an urgent need to bridge this gap by examining these compounds' roles in metabolic health and their implications for equity in nutrition research.

It is therefore pertinent to:

- make a review of existing literature on nutrition research, focusing on studies related to metabolic health challenges and the use of bioactive compounds in *Syzygium cumini* (Linn),
- propose strategies to improve inclusivity in nutrition research methodologies that would reflect the diversity of populations affected by metabolic diseases,
- suggest evidence-based recommendations for dietary interventions utilizing *Syzygium cumini*, tailored towards diverse demographic groups,
- advocate for policies and practices that promote equity in nutrition research and contributing to improved metabolic health outcomes for underrepresented communities.

Global Challenges of Metabolic Disorders

Metabolic syndrome or disorder is a complex multifactorial condition defined by a cluster of risk factors that predispose individuals to cardiovascular diseases, type 2 diabetes mellitus, high blood pressure, high blood sugar, cancers and the likes (WHO, 2023). Metabolic challenges including diabetes mellitus, dyslipidaemia, hypertension, cancer and obesity among others affect more than one billion people globally, with significantly higher incidence and mortality outcome in marginalized communities due to food insecurity and poor healthcare access (Braveman *et al*., 2022). Prevalence of metabolic disorder has increased in the past decades, across all socio-economic groups and particularly in low- and middle-income countries of Africa, largely due to rapid urbanization, lifestyle changes, and westernized diets (Williams *et al*., 2019). In Nigeria (South, East, North and West), metabolic disorder continues to be a growing public health concern, with significant implications for healthcare system (Eze *et al*., 2023; Usman *et al*., 2020; Ijeoma *et al.,* 2020; Olawale & Nwachukwu, 2023).

Metabolic disorders have been widely reported among school-age children (Ineji *et al.,* 2024), undergraduates (Ekene *et al*., 2023), elderly (Ibrahim & Olatunji, 2023), women (Danjuma & Oladipo, 2023), school teachers (Obasi & Adebola, 2022) and in rural and urban communities (Adejumo *et al*., 2017). Williams *et al*. (2023) and Bennett *et al*. (2022) reported a higher prevalence of metabolic syndrome among racial and ethnic minorities with low-income populations as a result of socioeconomic, genetic, and environmental factors. WHO (2023) opined that populations suffer disparities in prevention and treatment access worldwide due to socioeconomic, geographic, and cultural factors. Alzheimer's disease accounts for 60-70% of dementia cases, with 10 million cases reported annually while people over the age of 65 are most likely to suffer from the disease. It is estimated that by 2050, about 152 million people will have dementia worldwide, with two-thirds of them living in low- and middle-income countries (Breijyeh & Karaman, 2020).

Nutritional Composition and Chemical Constituents of *Syzygium cumini* (Linn)

Jamun (*Syzygium cumini*) has an impressive nutritional value with macro and micro nutrients in varying proportions depending on ripeness, variety, and growing conditions. Jamun is replete in carbohydrates, dietary fibres, fats, proteins, vitamins (A, B_1, B_2, B_3, B_6, and C), minerals (phosphorous, iron, calcium, sodium, potassium), and water. Generally, 100 grams of Jamun contains 251kg or 60 calories of energy, 14 grams of carbohydrates, 0.6 gram of dietary fibre, 0.23 gram of fat, 0.995 gram of protein, 0.019 mg of vitamin B_1 or thiamine, 0.009 mg of vitamin B_2 or riboflavin, 0.245 mg of B_3, 0.038 mg of vitamin B_6, 11.85 mg of vitamin C, 11.65 mg calcium, 1.41 mg of Iron, 35 mg of magnesium, 15.6 mg of phosphorus, 55 mg of potassium, 26.2 mg of sodium and water (Sharma *et al.,* 2020, Kumar *et al.,* 2022, Chowdhury *et al*., 2022).

Leaves: The composition of Jamun leaves according to Kumar *et al*. (2023) include: moisture content; 65.5-75.5%, carbohydrates; 20.5-25.5%, fibre; 5.5-7.5%, protein; 3.5-5.5% and fat; 1.0-2.0%. The vitamin contents were reported by Singh *et al.* (2015) and Sharma *et al.* (2020) as vitamin A; 200-300 µg/100g and vitamin C; 40-60 mg/100g. Rizvi *et al.* (2022) gave the mineral contents of Jamun leaves as potassium; 100-150 mg/100g, sodium; 5-10 mg/100g, calcium; 20-30 mg/100g, iron 2-3 mg/100g.

Tree Bark: The composition of Jamun tree bark, according to Harikanth and Suchithra (2022) include moisture content; 40-50%, carbohydrates; 30-40%, fibre; 10-15%, protein; 2-4%, fat; 1-2% and vitamin C;1020 mg/100g. The mineral compositions include potassium; 50-70 mg/100g, sodium; 2-5 mg/100g, and calcium; 15-25 mg/100g.

Seeds: The composition of Jamun seeds according to Raza *et al*. (2017) include moisture content; 30-40%, carbohydrates; 40-50%, fibre; 10-15%, protein;10-15%, fat; 20-30%. Jamun seeds according Sharma *et al.* (2020) also contain vitamin C; 5-10 mg/100g, potassium; 30-50 mg/100g, sodium; 1-2 mg/100g, and calcium; 10-20 mg/100g.

Fruits: According to Kumar *et al*. (2023), the fruits of Jamun contains moisture content; 77.3-82.2%, carbohydrates; 14.6-16.6%, fibre; 2.3-3.5%, fat; 0.3-0.5%, sugars; 10.3-12.1%, and protein; 1.2-1.6%. The vitamin C is 12.8-15.1 mg/100g, vitamin A is 10-20 µg/100g (Singh *et al.*, 2015), folate is 10-15 µg/100g (Kaur *et al*., 2016), potassium is 55-65 mg/100g (Sharma *et al*., 2022), with sodium; 1-2 mg/100g, calcium; 10-15 mg/100g, iron; 0.5-1.0 mg/100g and zinc; 0.2-0.5 mg/100g (Rao *et al*., 2019, Kumar *et al*., 2025).

Chemical constituents like isoquercetin, kaemferol**,** anthocyanins, ellagic acid, myricetin, glucoside and secondary metabolites like flavonoids**,** minerals (Ca, Mg, Na, K, and Cu), vitamins (thiamine, riboflavin, and nicotinic acid) also appear in various parts of Jamun plant (Kumar *et al*., 2022). Other bioactive compounds in Jamun include sterols, triterpenes, coumarins, tannins, glycosides, phenols, flavonoids, alkaloids, anthocyanin pigments and saponins.

Figure 1: *Syzygium cumini* (Linn) (Field work, 2024).

Innovative and culinary uses of Jamun (*Syzygium cumini*)

Traditional uses of Jamun (*Syzygium cumini*) as a versatile fruit in traditional culinary delicacy of the Indians and those in Asian countries are well documented (Lim, 2021). *Syzygium cumini* has various culinary uses in the Philippines, as juice, syrup and squash, while in India, the fruit juice makes delicious red wine. The versatility of Jamun makes it a valuable ingredient in various cuisines and its unique flavour and nutritional profile have enhanced its increased popularity in modern food products. Fresh fruits of Jamun are eaten raw, ripe, or unripe as the case may be, but they are best eaten ripe (Kumar *et al*., 2025). Fresh juice from jamun is consumed for its medicinal and therapeutic properties (Sharma *et al*., 2020). Jam or Jelly preserves are made with Jamun fruit pulp while spicy or sweet condiment is made when onions, and other spices are added (Patel *et al*., 2022). Jamun fruit is pickled in vinegar, salt, and spices for use, or as fillings in baked desserts (Kumar *et al*., 2025). Jamun fruit pulp is a good delight and the puree is used as a base for ice cream and sorbet (Rizvi *et al*., 2022).

In India, Jamun is used and consumed in Ayurvedic and traditional recipes (Kumar *et al*., 2022). In Southeast Asia, Jamun features in desserts, salads, and curries (Sharma *et al*., 2020). In the Caribbean, Jamun is used in jams, preserves, and sauces. Beverages are made from blends and fermented recipes of Jamun, they make refreshing drink when combined with other fruits. Fermented Jamun juice makes rich and fruity wine (Sharma *et al*., 2020). Dried leaves and flowers of Jamun are used for herbal tea (Parmar & Patel, 2022). Savoury dishes are also made when Jamun is added to meat or vegetable curries (Rizvi *et al*., 2022), or used as base for sauces, spices and marinades in addition to oil and spices (Kumar *et al*., 2022), or fried with vegetables and spices (Rao *et al*., 2020). Preserves (marmalade, jam) and spreads (butter, puree) are also products from the combination of jamun peel and pulp with some other food materials (Rizvi *et al*., 2022, Patel *et al*., 2020). The fruit pulp is used for smoothies and desserts, as well as energy bars, food supplements, and functional food materials (Kumar *et al*., 2025). Innovations for use of Jamun fruits, pulp and seeds include natural food colouring (Sharma *et al*., 2020). Jamun is mostly water

and carbohydrates which provide energy and considerable amounts of soluble and insoluble fibres that are beneficial for aiding digestion and cleansing the body of toxins (Kumar *et al*., 2025).

The Role of *Syzygium cumini* (Jamun) in Remediating Metabolic Challenges

There is increasing pollution and stress factors culminating in different types of ailments, havoc and epidemic health challenges for individuals and families in modern society. To overcome some of these problems, people are turning to alternative remedies through traditional practitioners and using various plant products like stem, leaves, fruits, seeds and bark of natural plants of which *Syzygium cumini* is a type (Rizvi *et al*., 2022; Kumar *et al*., 2025). Mergu and Satya (2020) concluded that *Syzygium cumini* has pro-fertility effect on female reproductive system to increase pregnancy rates outcome. Fresh extract of stem bark used as oral administration on Wistar rats was expected to alleviate the challenging menace of infertility problem and thus applicable to families in modern society. Traditional practitioners have used various plant products to treat infertility while the stem bark of *Syzygium cumini* had also been used to treat infertility where the effect on female reproductive organ increased the endometrial thickness to overcome the problem (Mergu & Satya, 2020). The efficacy of Jamun includes its antioxidant, anti-inflammatory, antihyperglycemic, and insulin-sensitizing potentials to remediate metabolic burden. Mohd *et al.* (2022) and Joshi *et al*. (2023) reported how indigenous communities explore traditional uses of *Syzygium cumini* (Jamun) and its role in managing diabetes mellitus. Jamun is used as a natural and powerful control of diabetes and prevention of cancer while also beneficial for the maintenance of heart health. Metabolic diseases affect vulnerable groups mostly and according to Ahmad *et al*., (2021), Jamun offers a potentially accessible and affordable complementary strategy. *Syzygium cumini* has shown promise in the treatment of Alzheimer's disease (Breijyeh & Karaman, 2020). Jamun is mostly water, fibre and carbohydrates and eating it gives a burst of energy. The high concentration of insoluble and soluble fibres in Jamun aid digestion, overcome constipation and help cleanse the body of unwanted toxins.

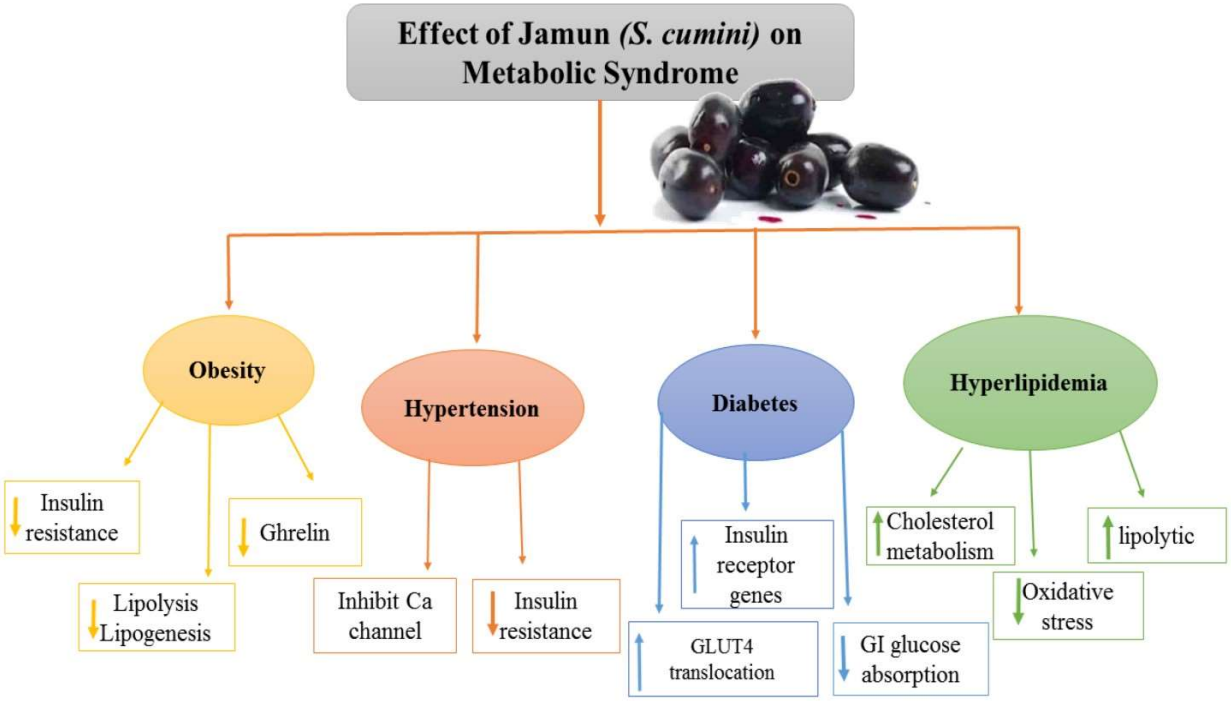

Figure 2: Effect of Jamun on metabolic syndrome (Rizvi *et al*., 2022).

The Importance of Equity, Diversity and Inclusivity (EDI) in Nutrition and Health Research

In the context of metabolic challenges, there is need for diverse research approaches. Embedding EDI in nutrition and health research can enhance efficacy, accessibility, and justice in metabolic health interventions. EDI is actually fundamental to scientific, innovative, and effective health intervention in public space for equity in addressing disparities in disease burden and resource access. Diversity is the inclusion of varied ethnicities, genders, socioeconomic backgrounds and inclusivity in co-designing of research with perceived marginalized communities. In Nigeria, clinical trials and health data collection are governed by a framework that aims to protect participants and ensure data integrity. National Agency for Food and Drug Administration and Control (NAFDAC), plays a major role in regulating and authorising clinical trials particularly for therapeutic and medicinal purposes. However, the National Health Research Ethics Committee (NHREC) reviews and approves all types of research that involves human and animal subjects, including clinical trials in adherence to international ethical and scientific standards (NAFDAC, 2024).

Despite its potential, Jamun research faces equity challenges as most documented clinical studies originate from indigenous regions of the plant (for example, South Asia), thus limiting its generalizability. Traditional knowledge holders of indigenous plant remedies in disease managements are often excluded from most clinical research design. In addition, commercialization of agro-allied produce usually benefits corporations rather than the source communities while accessibility barriers persist for vulnerable populations who ought to benefit most (Lal *et al*., 2024).

Nigeria has improved quite much on its digital technologies for health data collection and electronic data capture system with capable hardware for offline activities in remote areas. However, clinical trials and health data collection face unique challenges that include therapeutic misconception, lack of awareness, cultural bias or beliefs, demographic diversity and funding which usually affect recruitment, retention and reliability of research findings. Ethical review and approval for Clinical trial protocols are usually required in both the sponsoring country and research location (in Nigeria). Meanwhile, Nigeria invests just a small percentage of its GDP in research and development, leading to researchers often funding projects out-of-pocket. Many healthcare institutions lack the necessary equipment, resources, amenities, and technology required for research work, thus hindering data collection accuracy and reliability (Akpor *et al*., 2023). Inconsistent power supply and poor data management systems also impede efficient trial conduct.

Gaps, Challenges and Limitations of Current Homogeneous Researches

Historical limitations of current health research interventions documented over time include; relevance, accessibility, cultural, cost, exclusion of diverse populations in nutrition research, leading to health disparities and limited understanding of factors contributing to such disparities. Many nutrition studies have historically focused on specific population while often excluding certain categories of people probably as a result of study design, sampling process, ease of access, lack of awareness, funding opportunity, analytical methods, security and recruitment of personnel. Most studies lack representation from various heterogenous demographic backgrounds as they have been conducted in homogeneous minority populations, thus neglecting genetic, dietary and cultural variations that influence treatment efficacy (Williams *et al*., 2023). Lack of access to research facilities, in medical institutions with poor structures; cultural insensitivity when recruitment materials are not tailored to capture diverse communities (Garcia *et al*., 2022). Time and financial constraints also limit participation while health interventions may not address health disparities effectively (Bennett *et al*., 2022). Exclusion could be in terms of age, gender, race, culture, ethnicity,

disabilities, transportation, conflicting work schedules, geographical, linguistic barriers, or socioeconomic background (Martin *et al*., 2023).

The United Nations reports that one out of six people worldwide experience discrimination in some forms, with women and people with disabilities disproportionally affected (Agurs-Collins *et al*., 2024). In terms of age; significant number of studies usually exclude individuals over 75 years (70% of studies) or under 20years of age (72% of studies). Gender and sexual disparities, had also been identified with neglected groups which usually affects the understanding of nutrition-related health interventions among such minorities. Dietary interventions should be tailored to meet unique challenges of such marginalized individual minorities; because marginalized people may have more challenges adhering to treatment plans and medical guidance (Agurs-Collins *et al*., 2024). Racial or ethnic underrepresentation exists in most research communities which could create barriers to appropriate provision of care for generality of patients. A survey has revealed a lack of representation from racial and ethnic minorities among the leadership of professional societies in the field of nutrition (Sheikh, 2005). People with disabilities are often excluded whereas, nutrition programmes and dietary intake assessment methods are expected to take cognisance of individuals with disabilities, as their exclusion has broad implications on their general health (Agurs-Collins, *et al*., 2024). Cultural disparity and cultural competency would promote the integration of knowledge, awareness and sensitivity into nutritional care while diversity in workforce is also expected to increase the representation of diverse professionals in most studies. Commercialization of traditional knowledge without benefit-sharing is another common challenge in most researches.

Rationale for Incorporating Equity, Diversity and Inclusivity in *Syzygium cumini* Research

Equity, diversity, and inclusivity (EDI) are critical in health research to ensure that findings are relevant and accessible to various groups in the study population. EDI enables a wider range of perspectives, to ensure better innovative solutions and better health outcomes (Fitzgerald *et al*., 2021). Kumar *et al*., (2020) opined that utilizing culturally relevant botanicals like Jamun can bridge the gap between traditional knowledge and accessible healthcare in rural communities with limited resources. Israel *et al*., (2018) and Oh *et al*., (2022) cited the need for health organizations to build trust and partnerships with minority communities to enhance their recruitment and engagement in relevant health and nutrition research. It is important to develop an appropriate culturally adapted interventions and study protocols in disseminating strategies that respect and take cognisance of indigenous norms and languages (Garcia *et al*., 2022). Such culturally sensitive methodologies and designs would improve participation and quality of data collection among underrepresented groups (Koh *et al*., 2021). Funding agencies and policy makers need to mandate the inclusion of different categories of participants to strengthen research capacity (Williams *et al*., 2019; Williams *et al*., 2023).

Incorporating EDI principles in research on *Syzygium cumini* can lead to greater results and unprecedented health benefits for a wider society. Engaging with diverse communities can provide insights into indigenous applications of the plant and fruit, enhance participant recruitment, and ensure that research outcomes are culturally relevant. The collaborative approach would not only enrich research data but also empower community members by acknowledging their knowledge and practices. Exploring cultivation and processing models locally would empower local economies among small-scale farmers and ensure affordability of developed products or formulations from Jamun. A pilot data revealed that jamun-fortified meals improved glycaemic control in adolescents by 18% versus controls, suggesting scalable models for marginalized communities (Rizvi *et al*., 2022). A promising application of merging EDI and metabolic health would be successfully

incorporating Jamun into school meals as demonstrated with green banana biomass in Brazil (Tinoco *et al.,* 2022).

Conclusion

This paper aligns with global promotion of EDI in health research with focus on the underutilised potentials of *Syzygium cumini* Linn (Jamun) in remediating metabolic challenges across various demographics. The various enormous benefits in Jamun fruits of indigenous Asian origin are adopted to suggest that inclusive clinical trials on proposed research subjects be strategized to ensure that findings are relevant and beneficial to all other communities. However, funding and support is germane to translate research on indigenous knowledge to benefit communities where underutilized resources originated as locally tailored intervention. Focus on culturally relevant dietary interventions to promote equitable access to functional indigenous recipes using scientifically validated properties are necessary innovations in commercial nutrition programmes to remediate metabolic challenges in future studies.

Suggestions for Innovative Methodical Framework for Future EDI Focused Research

In order to incorporate innovation in nutrition management of metabolic health in conformity with global initiatives of equity, diversity and inclusivity (EDI) in health and nutrition research, the following are suggested;

1. Inclusive study design of human subjects should consider recruiting study cohorts with diverse backgrounds in terms of (ethnicity, gender, age, income) and in collaborations with traditional healers, community leaders and modern medical personnel.
2. There should be efforts in addressing socio-demographic barriers, lack of trust, logistic challenges, and the likes in order to attain effective, ethical nutrition research among rural communities and where Jamun is not yet known.
3. Other things should include language-accessible consent forms, mobile clinics for rural populations, fair compensation for participants and knowledge holders, with considerations for the physically challenged and the under-privileged.
4. Adoption of test and clinical samples that combines *in vitro*, *in vivo*, *in silico* studies and the use of animal with wide publications of research reports in open-access, multilingual formats.
5. Integrating innovative Jamun-based remedies into public nutrition and health programmes for marginalized groups (ethnic minorities, low-income groups, women, physically challenged, and rural communities).
6. Research funding is germane and therefore, grant requirements and community partnerships are of utmost importance.
7. Development of innovative and affordable healthy Jamun products that would be tailored and formulated to fit indigenous dietary practices to encourage general consumption.
8. Partnering with traditional healers and local growers for community-led cultivation and processing by indigenous industries and calls for obtaining patents on Jamun extracts (nutraceuticals) with focus on boosting local economies.
9. Equitable benefit-sharing with agrarian communities that are supplying raw materials to encourage accountability and promote accessibility of inexpensive products by the source communities.
10. Interdisciplinary collaborations of nutritionist with experts in the field of agriculture, biochemistry, economics, geography, public health, sociology, marketing and policy makers to encourage and enable inclusivity.

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