.1 RESEARCH GAP:

The World Health Organization (WHO) emphasizes the substantial public health issue posed by the global diabetes epidemic, particularly in Southeast Asia and the Western Pacific regions. In India, approximately 77 million adults aged 18 and older are affected by type 2 diabetes, with an additional 25 million individuals at risk of developing the condition due to prediabetes. Frighteningly, over half of diabetes cases remain undiagnosed, which can result in serious health complications if left untreated.Projections indicate that the current 171 million global cases of diabetes could escalate to 366 million by 2030. Thus, urgent exploration of novel medications, preventive as well as therapeutic approaches is imperative to effectively manage this pervasive metabolic disorder.

Traditional synthetic treatments for diabetes, including Biguanide and Sulphonylurea, aim to enhance glucose absorption by peripheral cells or act as Insulinotropic Secretagogues for pancreatic cells. However, these treatments are often associated with significant limitations, such as high costs and adverse effects like Hypoglycemia, weight gain, gastrointestinal issues, and liver toxicity. Despite the variety of available therapies, achieving complete recovery from diabetes remains elusive.

The WHO has identified approximately 21,000 medicinal plants globally, many of which have demonstrated Antidiabetic properties and other related health benefits. Given the multifactorial nature of diabetes and its association with various disorders, a comprehensive therapeutic approach utilizing medicinal plants may hold promise for managing this complex condition.

Natural products are still considered a valuable source of pharmaceutical goods and one of the best depositories of novel structurally bioactive chemicals. Over 25 % of current medicine is comprised of natural ingredients.Merely 15% of higher plants have been studied for potential biological activity.Herbal treatments are an effective way to cure diabetes, even in the absence of modern antidiabetic drugs.Throughout the world,numerous herbal treatments are used to cure diabetes.The substances present in herbal remedies and plant based medications are typically thought to be less hazardous and safer than those found in synthetic challenger.Numerous medications are marketed today as a result of studies done on medicinal plants. The combination of medicinal plants has emerged as a significant approach to harnessing their medicinal potential. By combining two or more medicinal plants, synergistic effects can be unlocked, leading to enhanced therapeutic outcomes. Many traditional systems of medicine, such as Ayurveda,

have long utilized formulations combining various therapeutic plants. It is believed that these combinations work by exerting diverse mechanisms of action and potentially augmenting each other's effects.

In developing countries, there is a growing demand for herbal medicines for primary healthcare. This demand arises not just due to their affordability but also because of their societal and cultural approval, suitability for the human body, and reduced side effects in contrast to synthetic drugs.Consequently, traditional plants that are readily available, particularly those with synergistic effects when combined, are chosen for research and development.

When medicinal plant extracts are combined, the beneficial effects of the formulation are often amplified, while potential side effects, if any, are mitigated. This combination approach is deemed superior to using isolated ingredients alone. Hence, this study aimed to create and evaluate the effectiveness of a polyherbal blend containing phytochemicals sourced from *Sesbania grandiflora* leaf powder (Fabaceae) and *Beta vulgaris* root powder (Chenopodiaceae) in a predetermined proportion.

The objective was to enhance the formulation's antidiabetic properties through this novel combination. To date, there has been no formulation available containing these herbal drugs together for their antidiabetic activity. Thus, this study represents an attempt to develop an herbal formulation and investigate its antidiabetic properties, filling an important gap in existing research.