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ABSTRACT

The present study aims to formulate and evaluate mucoadhesive buccal films for the effective management of Type-II diabetes mellitus using a combination of polymers Hydroxypropyl Methylcellulose (HPMC K15), Eudragit L100, and Eudragit S100. Buccal films offer a promising alternative to conventional oral dosage forms by bypassing hepatic first-pass metabolism and providing controlled and targeted drug release. In this formulation, HPMC K15 was employed as the primary mucoadhesive and film-forming polymer, while Eudragit L100 and Eudragit S100 were incorporated to modulate drug release and enhance film stability under varying pH conditions. The films were prepared using the solvent casting technique, and various preformulation studies were carried out to optimize polymer ratios.

The prepared films were evaluated for physicochemical properties such as thickness, weight variation, surface pH, folding endurance, drug content uniformity, tensile strength, and mucoadhesive strength. In vitro drug release studies were performed using a simulated buccal fluid (pH 6.8), and the drug release kinetics were analyzed. The optimized formulation exhibited good mucoadhesive strength, sustained drug release over an extended period, and favourable physicochemical characteristics. This study highlights the potential of mucoadhesive buccal films as an efficient, non-invasive, and patient-friendly drug delivery system for managing Type-II diabetes.