Introduction
Chronic hyperglycemia results in diabetes associated complications development that is nowadays a global health disorder without efficient therapeutic application. Hyperglycemia, hyperlipidemia and oxidative damage are major reasons of diabetes accelerated renal and cardiovascular diseases. Hyperglycemia enhances oxidative injury of cellular macromolecules by making disruption of ATP generation processes, activating polyol pathway, rising hexosamine process and formation of advanced glycation end products (AGEs). In fact, hyperglycemia induced oxidative stress increase micro-inflammatory pathways which lead to overexpression of adhesion molecules, enhancement of vascular permeability and infiltration of inflammatory cells into extracellular space. NADH oxidase enzyme contributes to reactive oxygenated species production in diabetic complications. Recent studies also have indicated that Nox4, an iso-enzyme of NADH oxidase family, is major source of superoxide radical and hydrogen peroxide in diabetic nephropathy (1). Hyperlipidemia and diabetes associated complications are inseparably related together. In fact insulin resistance, alleviation of insulin production and release are responsible for alteration of normal lipid metabolism in adipose tissue. Thus, high level of free fatty acids is mobilized to liver. In addition, NADPH oxidase activity increases generation of radicals in adipose tissue that cause overproduction of pro-inflammatory adipocytokines, lead to systemic and local inflammation development (2).

Recently, medicinal plants have attracted considerable attention as favorable curative applications in the treatment, alleviation and management of complications associated with chronic hyperglycemia and hyperlipidemia due to they contain various bioactive constituents and less toxic adverse effects, Brassica napus is one such plant.

Implication for health policy/practice/research/medical education:
Hyperglycemia, hyperlipidemia and oxidative damage are major reasons of diabetes accelerated renal and cardiovascular diseases. Medicinal plants have attracted considerable attention as favorable curative applications in the treatment, alleviation and management of complications associated with chronic hyperglycemia and hyperlipidemia due to they contain various bioactive constituents and less toxic adverse effects, Brassica napus is one such plant.

Keywords:
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Brassica napus and diabetic complications
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Hibiscus esculentus and diabetes mellitus

Researchers have investigated the antidiabetic properties of Hibiscus esculentus, especially in the context of preventing AGEs (advanced glycation end products) formation, which are implicated in the development of hyperglycemia-related complications. Hibiscus esculentus has been shown to capture methylglyoxal (MGO) and attenuate carbonyl groups (4).

In several studies, the antidiabetic properties of Brassica vegetables and oilseed have been examined in diabetic animal models. For instance, in a study by Akbari and colleagues, boiled extracts of Brassica napus were found to decrease cholesterol, LDL-C, triglyceride, and glucose levels and enhance high-density lipoprotein-cholesterol (HDL-C) in diabetic rats compared to control groups (5).

Likewise, in a recent study, raw and cooked Brassica napus were administered to diabetic rats for 4 weeks. Both types of Brassica administration led to improvements in serum levels of lipid and glucose, with the cooked Brassica extract being particularly promising (6).

Thus, Brassica napus is effective in reducing hyperglycemia associated complications through preventing AGEs formation. It is capable of capturing methylglyoxal (MGO) and attenuating carbonyl groups (4).

In the study of Akbari and colleagues, on Alloxan induced diabetic rats, the impact of boiled extract of Brassica napus on hyperlipidemia and metabolic alterations were investigated. They concluded that boiled extract of Brassica napus significantly decreases cholesterol, LDL-C, triglyceride and glucose level and enhances high-density lipoprotein-cholesterol (HDL-C) in compared with control group (5).

Ethical considerations
Ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the author.

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Authors’ contribution
FDS is the single author of the paper.

Conflicts of interest
The author declared no competing interests.

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