

**KONJAC GLUCOMANNAN REDUCE BLOOD SUGAR LEVELS  
IN OBESITY ADOLESCENTS****Sugeng Mashudi<sup>1</sup>), Hayun Manudyaning Susilo<sup>2</sup>, Dianita Rifqia Putri <sup>3</sup>,  
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**Abstrak**

*Given the connection between diabetes prevention and the inhibition of diet-induced glucose and insulin elevations, we looked into the effects of konjac glucomannan to blood glucose. The purpose of this study was to determine the effect of konjac glucomannan to blood glucose in obese adolescents. A total of 20 student subjects with no history of diabetes participated in the study. The study used a pre-experimental method with one group pre-posttest design. Research data were collected using a glucometer instrument, observation sheet, and capsules containing glucomannan. General data were analyzed descriptively and specific data were analyzed using the Wilcoxon signed-rank test. The results showed that after 30 days of intervention, the blood glucose levels in the respondents before the intervention were mostly pre-diabetic as many as 12 people (60%) and the remaining 8 people with diabetes (40%). Meanwhile, the blood glucose levels in the respondents after the intervention were normal, the majority were 16 (80%) and the remaining 4 were in the pre-diabetes category (20%). Konjac glucomannan can reduce the value of blood glucose metabolism in obese adolescents. Furthermore, greater inhibitory effects on glucose and insulin elevation were observed in the intervention group than in the control group.*

**Keywords:** Konjac Glucomannan, Obese Teenagers, Blood Glucose, 30 days intervention

**INTRODUCTION**

Diabetes mellitus is one of the oldest diseases, having been defined 3000 years ago by the ancient Egyptians (Olokoba et al., 2012). Diabetes is a chronic metabolic disorder caused by pancreatic  $\beta$ -cell malfunction and progressive insulin secretion failure as well as insulin resistance (Devaraj et al., 2019; Meghatria & Belhamiti, 2021). Insulin resistance is a disease that causes insulin target tissues to be less sensitive to normal circulating insulin levels. Furthermore, in insulin-resistant individuals, the degree of glucose tolerance is primarily determined by the extent of insulin resistance and the pancreas's ability to cope with this defect (Ramírez-Alarcón et al., 2022). Diabetes is thought to be caused by genetic factors, weight gain from overeating, and a lack of physical activity. Obesity and insulin resistance are caused by excessive insulin

secretion, which reduces the insulin secretory capacity of pancreatic  $\beta$ -cells (Andreadi et al., 2022). Mechanisms of disease: Molecular and metabolic mechanisms of insulin resistance and beta-cell failure in type 2 diabetes (Behera & Ray, 2016). The purpose of this study was to determine the effect of konjac glucomannan to blood glucose in obese adolescents.

## RESEARCH METHODS

A total of 20 student subjects with no history of diabetes participated in the study. The study used a pre-experimental method with one group pre-posttest design. Research data were collected using a glucometer instrument, observation sheet, and capsules containing glucomannan. General data were analyzed descriptively and specific data were analyzed using the Wilcoxon signed-rank test.

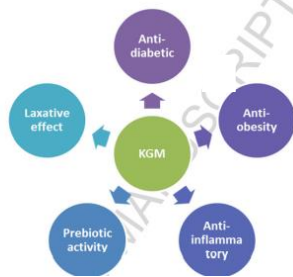
## RESULTS AND DISCUSSION

A total of 20 respondents were tested for blood glucose. before being given treatment, it showed that there were 12 respondents classified as pre-diabetic and 8 respondents classified as diabetic. after being given konjac glucomannan normal blood glucose values were 16 respondents and 4 respondents were classified as pre-diabetic. The test results by Wilcoxon Signed Ranks Test show  $p = 0.00$ , meaning that there is an effect of konjac glucomannan on blood glucose.

**Tabel 1.** Effect KGM on Blood Glukosa

	Pra	Post	P (Wilcoxon Signed Ranks Test)
Pra diabetes	12	0	P=0.00
Diabetes	8	4	
Normal	0	16	
Total	20	20	

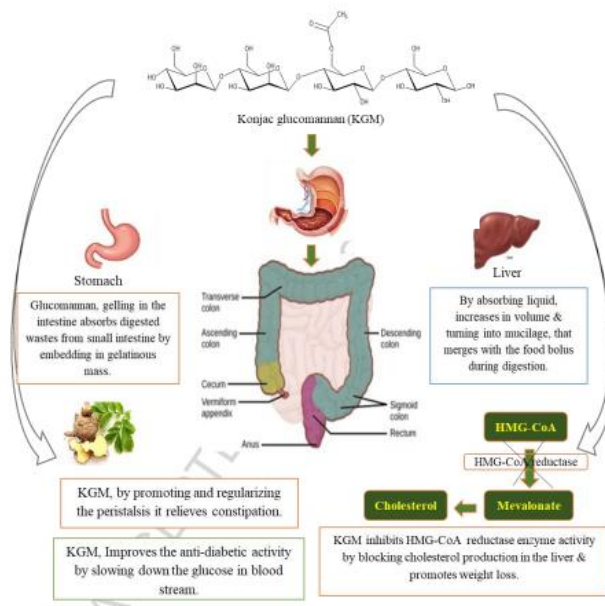
Konjac glukomannan, a water-soluble, non-ionic hydrocolloidal dietary fiber, has numerous health benefits and forms a soft gel when combined with water. Several studies on the health benefits of glucomannan have found that it can improve hyperglycemia, lower blood cholesterol, and promote regular bowel movement. **Figure 1** depicts the various biological activities of KGM.



Source:(Devaraj et al., 2019)

**Figure 1.** Schematic representation of different biological activities of KGM.

KGM is a polysaccharide chain composed of -D glucose and -D-mannose with attached acetyl groups in a molar ratio of 1:1.6, with -1,4 linkages [58]. Because human salivary and pancreatic amylase cannot split the -1, 4 linkages, KGM is highly fermented by host bacteria and passes relatively unchanged into the colon. The most important and valuable property of KGM is its ability to absorb large amounts of liquids and convert them into mucilage by increasing its volume. During digestion, it combines with the food bolus and forms a nondigestible coat on the bolus, causing sugar and fat retention and reducing assimilation and metabolism.



Source:(Devaraj et al., 2019)

**Figure 2.** Mechanism of action of KGM

In the stomach and intestine, KGM absorbs digested body waste by entrapping it in a gelatinous mass which is excreted without being absorbed by the body. KGM's gelatinous nature in the body provides a sense of satiety and fullness while also promoting peristalsis, which helps to regulate bowel movements. Because of the viscosity produced in the gastrointestinal compartments, it acts as a barrier to sugar and nutrient absorption. Figure 2 depicts the main anti-diabetic, anti-obesity, and laxative effects of KGM.

This study is in line with other studies showing the positive effects of konjac glucomannan. Diets containing konjac glucomannan were able to control hyperglycemia, hyperlipidemia and increase adiponectin levels in adipose tissue, implying an anti-hypertrophic and insulin-sensitizing adipokine effect in this tissue (Mashudi et al., 2022; Vázquez-Velasco et al., 2015). KGM supplementation improved blood lipid levels by increasing fecal excretion of neutral sterol and bile acid and alleviated diabetic subjects' elevated glucose levels. (Li et al., 2021). Various kinds of potential konjac glucomannan on health can be an effective treatment option for humans. One of the benefits proven by the author is that Konjac glucomannan can be an alternative treatment and prevention of diabetes mellitus.

## CONCLUSION

Konjac glucomannan can reduce the value of blood glucose metabolism in obese adolescents. Konjac glucomannan has anti-diabetic, anti-obesity, laxative, and anti-inflammatory activity.

## ACKNOWLEDGMENT

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