

**ABSTRACT**

**THE EFFECT OF GIVING ALKALINE PH WATER COMBINE WITH  
PHYSICAL EXERCISE TRAINING ON BLOOD GLUCOSE LEVEL AND  
GLUT 4 QUANTITY IN MUSCLE CELL MEMBRANE OF RAT  
(RATTUS NORVEGICUS) DIABETES MELLITUS MODEL**

*True Experimental Research*

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Metabolic system disorders experienced by DM patients can lead to unmet energy needs so that people easily feel hungry, thirsty, and tired until become the complication causes of other diseases. DM management consists of 5 main pillars, including nutrition fulfillment, physical exercise, medication, education, blood glucose monitoring. Utilize a combination of nutritional fulfillment and physical exercise can optimize the stability of blood glucose levels.

The study design used the randomized post-test only control group design with the number of samples using the Federer formula, 30 male white Wistar strain male rat, divided into five groups. The first group as negative control group, second group as positive control (induce STZ 50mg / kgBB), third group was given alkaline water 20 ml / day, fourth group was done swimming exercise 4 times a week with duration 30 minutes, fifth group was given the combination of two treatments, Where the treatment was carried out for 28 days. Data analysis using MANOVA test.

The results of this study were, there was effect of giving alkaline pH water and physical swimming exercise on blood glucose and GLUT 4 with  $p \leq 0.01$ . This study shows that combination therapy can reduce fasting blood glucose levels and 2 hours of PP blood glucose level to normal limits. Provision of a single alkaline water therapy, and physical exercise can lower fasting blood glucose levels to normal levels, but have not been able to reduce 2 hours PP blood glucose levels to normal limits. The number of GLUT 4 has not shown any changes to the therapy.

**Key Words:** Alkaline Water, Swimming Exercise, GLUT 4, Blood Glucose Level