

# Meritve vitalne pljučne kapacitete

**Področje naloge: interdisciplinarno področje (biologija, matematika)**

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## **POVZETEK**

Raziskovalne naloge sem se lotil v času epidemije COVIDa. Ker je v tem času za to boleznijo obolelo kar nekaj znancev, je dotična bolezen pri meni zbudila precej zanimanja. Kot vemo, bolezen lahko prizadane več organskih sistemov (npr. živčni, dihalni...). Mene pa je v okviru te bolezni najbolj pritegnilo zmanjšanje funkcije dihal, zaradi katere so ljudje nemalokrat pristali na ventilatorjih. Poiskal sem razpoložljivo literaturo o zgradbi, delovanju in zmogljivosti pljuč. Porodila pa se mi je tudi ideja, da raziščem vpliv različnih dejavnikov, ki vplivajo na vitalno kapaciteto. V raziskavi sem proučeval odvisnost vitalne kapacitete od telesne aktivnosti, telesne višine in starosti. V raziskavo sem vključil še tri družinske člane, različne po starosti in športnem udejstvovanju. Meritve sem načrtoval z napihovanjem balonov ter merjenjem njihovih premerov vsakega udeleženca raziskave posebej. Na koncu pa sem z matematično enačbo izračunal še prostornino.

Vsa ugotovljena dejstva sem skušal z znanstveno podprtimi dejstvi povezati v celoto, ki bo pripomogla k ohranjanju zmogljivosti dihal ter zdravja nasploh.

**Ključne besede:** dihanje, vitalna kapaciteta pluč, pljučno in celično dihanje, mehanizem dihanja

## **ABSTRACT:**

I undertook the research task during the COVID epidemic. Since quite a few acquaintances fell ill with this disease at that time, the disease aroused a lot of interest in me. As we know, the disease can affect several organ systems (e.g. nervous, respiratory, ...). However, in the context of this disease, I wanted to focus on the respiratory function, which often led people to land on ventilators. I collected the available literature on the structure, function, and capacity of the lungs. I also had the idea to explore the impact of various factors that affect vital capacity. I studied the dependence of vital capacity on physical activity, height, and age. I included three other family members in the research, who varied in age and sports activities. I planned the measurements by inflating the balloons and measuring their diameters for each research participant separately. Finally, I calculated the volume with a mathematical equation.

I tried to connect all the established facts with scientifically supported facts into a summary, which will help to maintain respiratory capacity and health in general.

**Key words:** respiration, vital capacity of the lungs, pulmonary and cellular respiration, mechanism of respiration