Problem-Based Task 4.3.3: Good Cholesterol and Exercise

Cholesterol is a substance found in human blood. There are two types of cholesterol: HDL (high-density lipoprotein) and LDL (low-density lipoprotein). HDL is a good type of cholesterol, and LDL is the type of cholesterol that can lead to heart attacks and strokes. The sum of HDL and LDL cholesterols is your total cholesterol: HDL + LDL = total cholesterol. A doctor tested 20 patients' cholesterol levels. She asked each patient how often he or she exercises. The table below shows each patient's weekly hours of exercise and HDL cholesterol level, in milligrams per deciliter (mg/dL).

Hours of exercise	HDL cholesterol (mg/dL)
2	47
0	30
1	63
1.5	54
7.5	75
6	53
8.5	86
0.5	45
3	49
6.5	71
1	50
7	40
2	47
5	57
1	31
4	52
5	79
3.5	50
2	58
0	38

The doctor is trying to understand if exercise has an impact on HDL cholesterol. What is the correlation between hours exercised per week and HDL cholesterol level? Is it likely there is a causal relationship between exercise and HDL cholesterol levels?

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Problem-Based Task 4.3.3: Good Cholesterol and Exercise Coaching

a. Create a scatter plot of the data.

b. Describe the shape of the graph.

c. Does it appear that there is a relationship between exercise and HDL cholesterol levels?

d. What is *r*, the correlation coefficient?

e. What does *r* tell us about the relationship between exercise and HDL cholesterol levels?

f. Is it likely that exercising for more hours each week causes higher levels of HDL cholesterol?

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