The scheme we just derived is known as Runge's (~1895) or modified Euler's or explicit midpoint method (EM).

We write it as

$$k_1 = f(t_j, y_j)$$

$$k_2 = f(t_j + h/2, \underbrace{y_j + h/2 \cdot k_1}_{\tilde{y}_{j+1/2}})$$

slope approx.!

$$y_{j+1} = y_j + h \cdot k_2$$

Another possibility is Heun's method

$$k_1 = f(t_j, y_j)$$

$$k_2 = f(t_j + h, y_j + h \cdot k_1)$$

$$y_{j+1} = y_j + \frac{h}{2}(k_1 + k_2)$$

or the explicit trapezoidal method (ET)

Graph: