Can we move a merry-go-round by applying a force along the radial direction? Explain.

The force would be directed towards the center and so act on the central turning axis with zero distance from the axis. The turning moment (or torque) would then be zero

$$\vec{M} = \left[\vec{l} \times \vec{F}\right] = \left[0 \times \vec{F}\right] = 0$$

Therefore no angular rotation would occur.

Answer: no, we can't.