2.50

$n=1$ $\quad 2(\sqrt{2}-1) < 1$ ✓

$n=k+1$ $\quad 2(\sqrt{k+2}-1) \overset{?}{<} \underbrace{1+\frac{1}{\sqrt{2}}+\dots+\frac{1}{\sqrt{k}}}+\frac{1}{\sqrt{k+1}}$

$2(\sqrt{k+2}-1) \overset{?}{<} 2(\sqrt{k+1}-1)+\frac{1}{\sqrt{k+1}}$

$2\sqrt{k+2} \overset{?}{<} 2\sqrt{k+1}+\frac{1}{\sqrt{k+1}}$

$2\sqrt{k+2} \overset{?}{<} \frac{2(k+1)+1}{\sqrt{k+1}} = \frac{2k+3}{\sqrt{k+1}}$

$2\sqrt{(k+2)(k+1)} \overset{?}{<} 2k+3 \quad /()^2$

$4k^2+12k+8 < 4k^2+12k+9$ ✓