For $|q| < 1$ and given a function $f(x)$ with $x = \cos \theta$, the Askey-Wilson operator, $\mathcal{D}_q$ on $f$ is defined by

$$(\mathcal{D}_q f)(x) := \tilde{f}(q^{1/2}z) - \tilde{f}(q^{-1/2}z),$$

where

$$\tilde{f}(z) := f \left( \frac{1}{2} \left( z + \frac{1}{z} \right) \right), \quad z = e^{i\theta}.$$

Let $P_n$ be a polynomial of degree $n$. By applying $\mathcal{D}_q$ on $P_n$ we obtain a Riesz-type interpolation from which we establish a Bernstein-type inequality:

$$|(\mathcal{D}_q P_n)(x)| \leq \frac{1}{\sqrt{1 - x^2}} \cdot \frac{q^{n/2} - q^{-n/2}}{q^{1/2} - q^{-1/2}} \cdot \max_{\zeta \in [-1,1]} |P_n(\zeta)|, \quad x \in (-1, 1).$$

As $q \to 1^-$, the above inequality reduces to the classical Bernstein inequality

$$|P_n'(x)| \leq \frac{n}{\sqrt{1 - x^2}} \cdot \max_{\zeta \in [-1,1]} |P_n(\zeta)|, \quad x \in (-1, 1),$$

with equality being achieved for $P_n \equiv cT_n$ for some constant $c$, where $T_n(x) = \cos(n \arccos x)$ is the Chebyshev polynomial of first-kind. Several other related results were also obtained. Our proofs are based on the ideas of G. Szegö and M. Riesz. (Received June 20, 2017)