In [1]:
```
# Step 1: Import libraries
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.datasets import load_iris
from sklearn.cluster import KMeans
from sklearn.decomposition import PCA
from sklearn.preprocessing import StandardScaler
```

In [2]:
```
# Step 2: Load Iris Dataset
iris = load_iris()
X = pd.DataFrame(iris.data, columns=iris.feature_names)
```

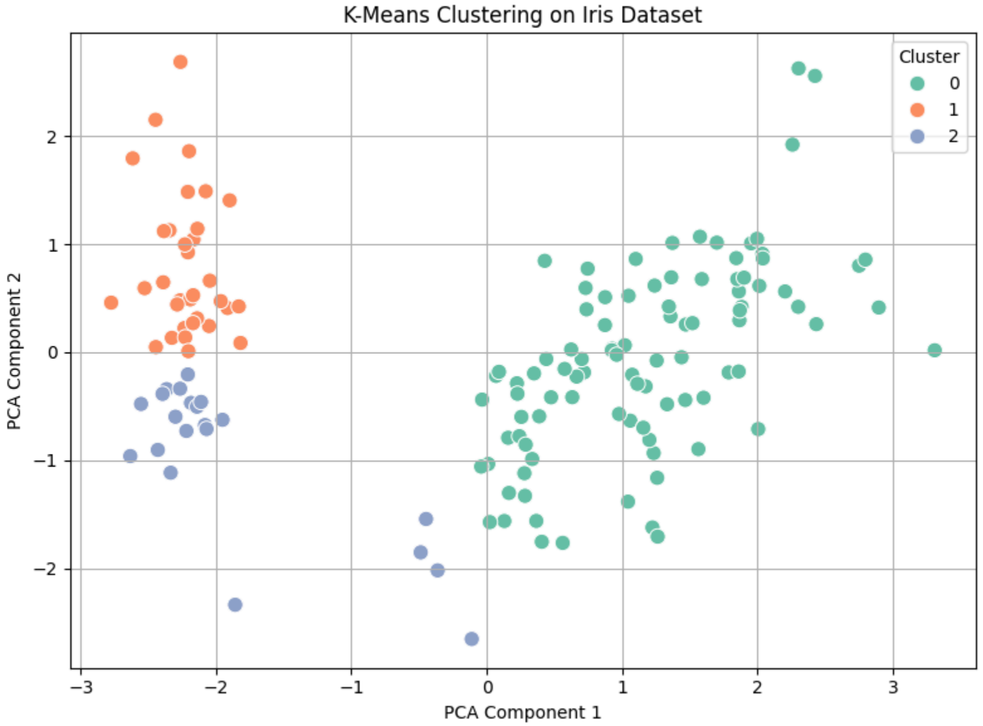
In [3]:
```
# Step 3: Scale the data (important for KMeans)
scaler = StandardScaler()
X_scaled = scaler.fit_transform(X)
```

In [4]:
```
# Step 4: Apply KMeans Clustering
kmeans = KMeans(n_clusters=3, random_state=42)
y_kmeans = kmeans.fit_predict(X_scaled)
```

In [5]:
```
# Step 5: Add Cluster Labels to DataFrame
X['Cluster'] = y_kmeans
```

In [6]:
```
# Step 6: Visualize Clusters using PCA
pca = PCA(n_components=2)
X_pca = pca.fit_transform(X_scaled)
X['PCA1'] = X_pca[:, 0]
X['PCA2'] = X_pca[:, 1]
```

In [7]:
```
plt.figure(figsize=(8,6))
sns.scatterplot(x='PCA1', y='PCA2', hue='Cluster', data=X, palette='Set2', s=80)
plt.title("K-Means Clustering on Iris Dataset")
plt.xlabel("PCA Component 1")
plt.ylabel("PCA Component 2")
plt.legend(title='Cluster')
plt.grid(True)
plt.tight_layout()
plt.show()
```


K-Means Clustering on Iris Dataset
Cluster
0
1
2
PCA Component 2
PCA Component 1
−3
−2
−1
0
1
2
3
−2
−1
0
1
2