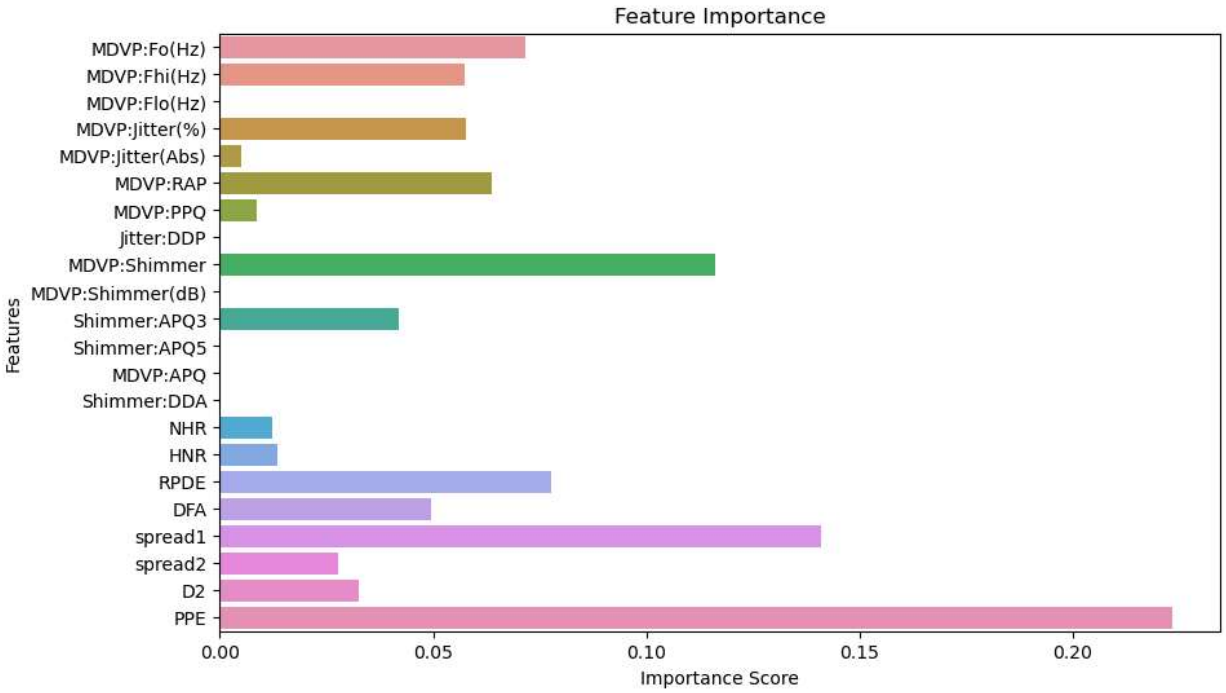
In [2]:
```
import pandas as pd
from sklearn.model_selection import train_test_split
from xgboost import XGBClassifier
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix

# Load the datasets
data_path = 'parkinsons.data'
parkinsons_df = pd.read_csv(data_path)

# Preparing the data
X = parkinsons_df.drop(columns=['name', 'status'])  # Dropping the name and target col
y = parkinsons_df['status']  # Target variable

# Splitting the data into training and testing sets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=

# Initializing and training the XGBoost model
model = XGBClassifier(use_label_encoder=False, eval_metric='logloss', n_estimators=50)
model.fit(X_train, y_train)

# Making predictions on the test set
y_pred = model.predict(X_test)

# Evaluating the model
accuracy = accuracy_score(y_test, y_pred)
classification_rep = classification_report(y_test, y_pred)
conf_matrix = confusion_matrix(y_test, y_pred)

# Output results
print(f"Accuracy: {accuracy}")
print("Classification Report:\n", classification_rep)
print("Confusion Matrix:\n", conf_matrix)
```

```
Accuracy: 0.9487179487179487
Classification Report:
              precision    recall  f1-score   support

           0       1.00      0.71      0.83         7
           1       0.94      1.00      0.97        32

    accuracy                           0.95        39
   macro avg       0.97      0.86      0.90        39
weighted avg       0.95      0.95      0.95        39

Confusion Matrix:
 [[ 5  2]
 [ 0 32]]
```

```
C:\Users\ashis\anaconda3\Lib\site-packages\xgboost\sklearn.py:1395: UserWarning: `use
_label_encoder` is deprecated in 1.7.0.
  warnings.warn("`use_label_encoder` is deprecated in 1.7.0.")
```

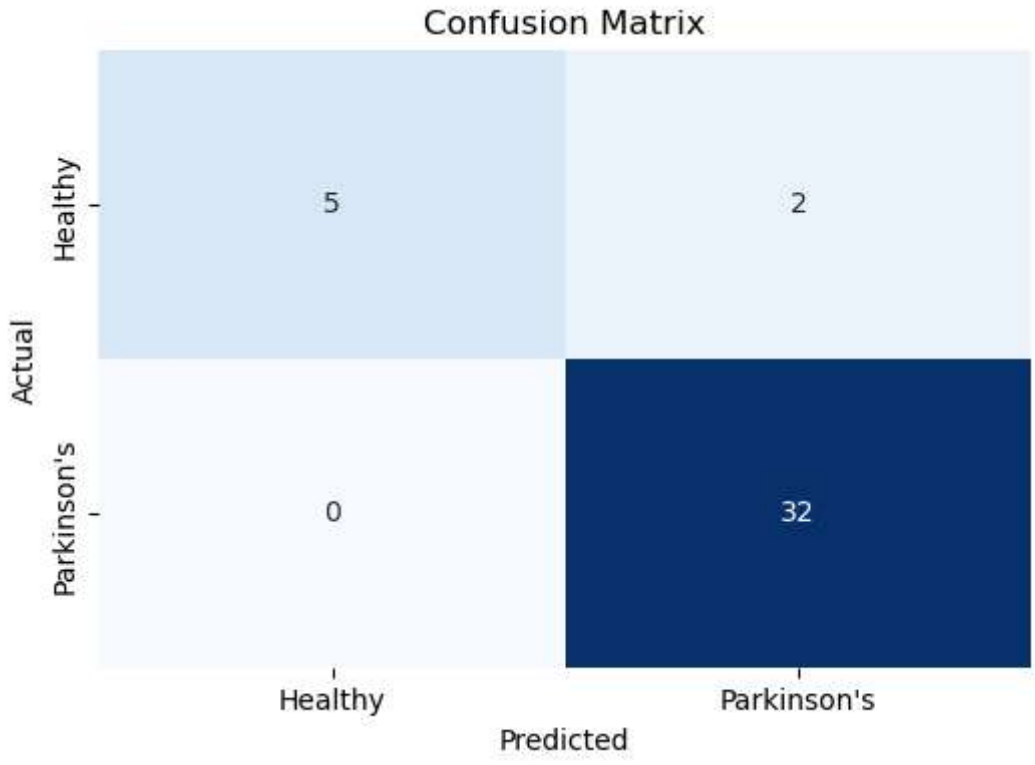
In [3]:
```
import matplotlib.pyplot as plt
import seaborn as sns

# Feature Importance Plot
plt.figure(figsize=(10, 6))
sns.barplot(x=model.feature_importances_, y=X.columns)
plt.title('Feature Importance')
```

```
plt.xlabel('Importance Score')
plt.ylabel('Features')
plt.show()
```

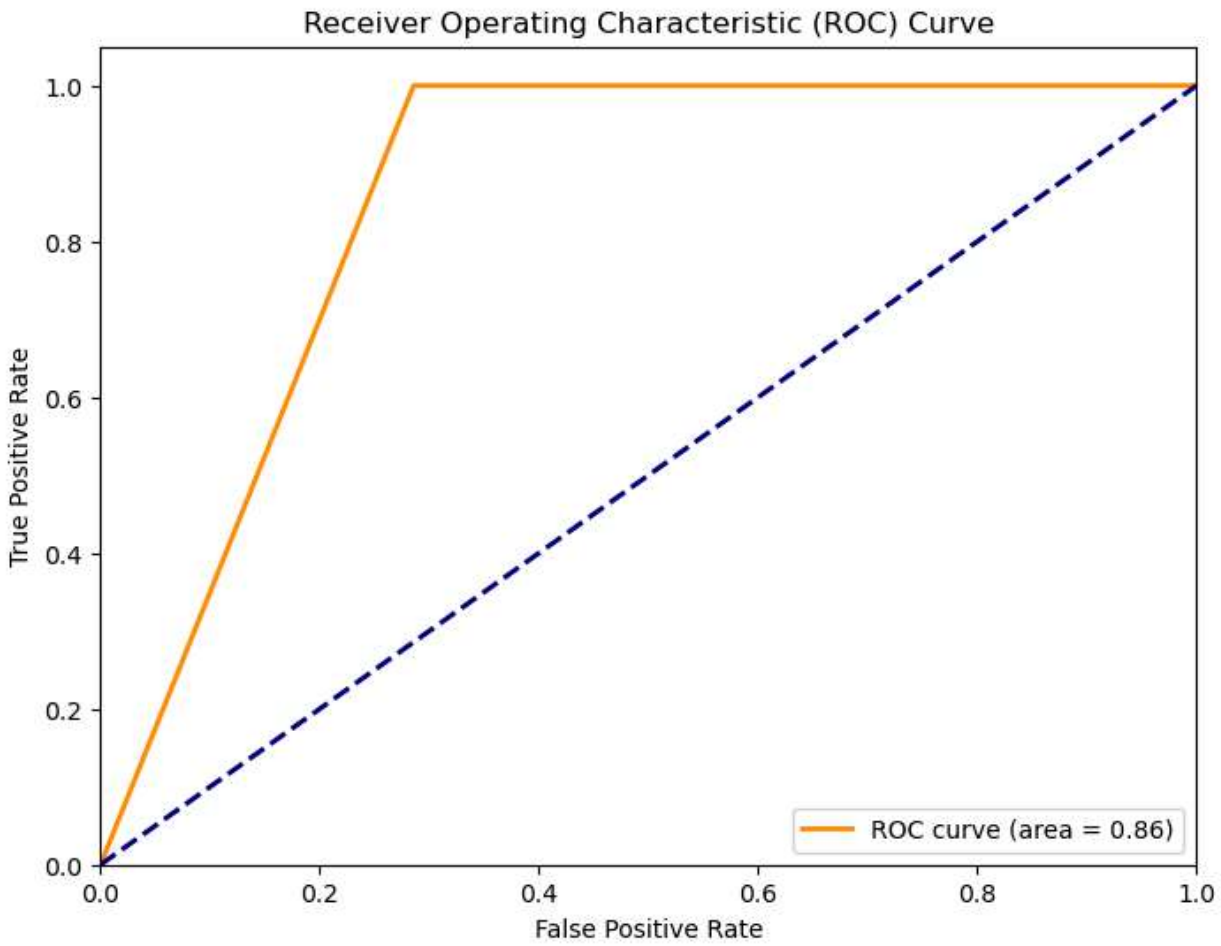


In [5]:

```
# Confusion Matrix Plot
plt.figure(figsize=(6, 4))
sns.heatmap(conf_matrix, annot=True, fmt='d', cmap='Blues', cbar=False,
            xticklabels=['Healthy', 'Parkinson\'s'], yticklabels=['Healthy', 'Parkinsc
plt.title('Confusion Matrix')
plt.xlabel('Predicted')
plt.ylabel('Actual')
plt.show()
```



In [4]:
```
from sklearn.metrics import roc_curve, auc

# ROC Curve
fpr, tpr, _ = roc_curve(y_test, y_pred)
roc_auc = auc(fpr, tpr)

plt.figure(figsize=(8, 6))
plt.plot(fpr, tpr, color='darkorange', lw=2, label='ROC curve (area = %0.2f)' % roc_au
plt.plot([0, 1], [0, 1], color='navy', lw=2, linestyle='--')
plt.xlim([0.0, 1.0])
plt.ylim([0.0, 1.05])
plt.xlabel('False Positive Rate')
plt.ylabel('True Positive Rate')
plt.title('Receiver Operating Characteristic (ROC) Curve')
plt.legend(loc="lower right")
plt.show()
```



In [ ]: