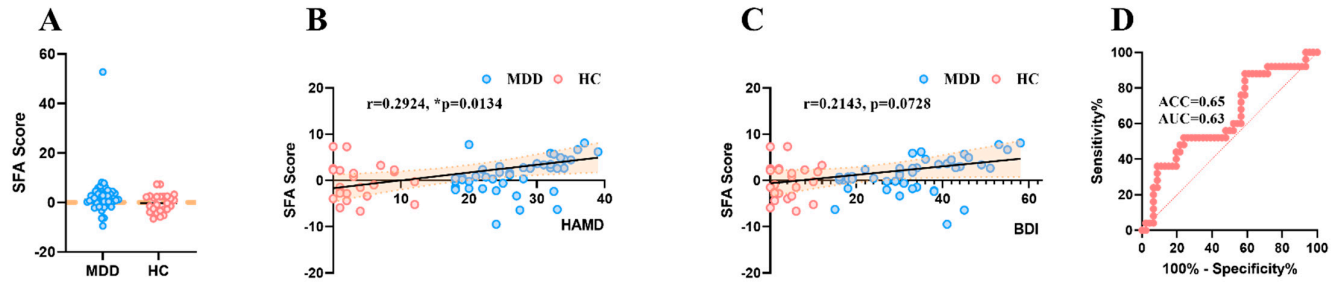


**Supplementary Table S1. The detailed inclusion and exclusion criteria for all subjects**

<b>Group</b>	<b>Inclusion Criteria</b>	<b>Exclusion Criteria</b>
MDD	<ul style="list-style-type: none"> <li>(1) The diagnosis of MDD should be made by middle-level doctors with psychiatric licenses according to the screening criteria of ICD-10;</li> <li>(2) Onset of the disease for the first time and no previous psychiatric drug treatment;</li> <li>(3) Hamilton Rating Scale for Depression (17 items) score &gt;17;</li> <li>(4) Aged 18 to 35 years old, understood and voluntarily signed a written informed consent.</li> </ul>	<ul style="list-style-type: none"> <li>(1) History of bipolar disorder or other non-affective psychotic disorders;</li> <li>(2) Family history of mental illness, or history of substance abuse or alcoholism;</li> <li>(3) History of cerebrovascular and other brain diseases, such as cerebral hemorrhage, cerebral infarction, epilepsy and brain tumors, etc.;</li> <li>(4) Severely impaired vision/hearing or limb movement, which makes it impossible to complete the experiment;</li> <li>(5) Contraindications to MRI, such as implanted cardiac pacemaker, metal denture, etc. Or the researchers deemed inappropriate for participants.</li> </ul>
HC	<ul style="list-style-type: none"> <li>(1) Aged 18 to 35 years old, understood and voluntarily signed a written informed consent;</li> <li>(2) Hamilton Rating Scale for Depression (17 items) score &lt; 7.</li> </ul>	<ul style="list-style-type: none"> <li>(1) History of major psychiatric disorders as defined by ICD-10;</li> <li>(2) Family history of mental illness, or history of substance abuse or alcoholism;</li> <li>(3) Contraindications to MRI, such as implanted cardiac pacemaker, metal denture, etc. Or the researchers deemed inappropriate for participants.</li> </ul>

ICD-10: the tenth revision of the International Statistical Classification of Diseases and Related Health Problems.

Testing set



**Supplementary Figure S1.** The diagnostic capability of the multimodal MRI patterns (QSM and GMV features) was evaluated. **(A)** When SFA score exceeded 0, the individual was categorized as an MDD patient. Conversely, a subject was designated as a HC when the SFA score was below 0. Analysis of the bar chart demonstrates that a majority of individuals were accurately classified. **(B)** This SFA score exhibited a significant positive correlation with HAMD. **(C)** No significant correlation was found between the SFA score and BDI. **(D)** From the receiver operating characteristic (ROC) curve, we can see that the classification accuracy for the MDD and HC groups in the testing dataset is 65%, with an area under the curve of 0.63. SFA = structural feature abnormalities; MDD = major depressive disorder; HC = healthy control; HAMD = Hamilton Rating Scale for Depression; BDI = Beck Depression Inventory; ACC = accuracy; AUC = area under the curve.