

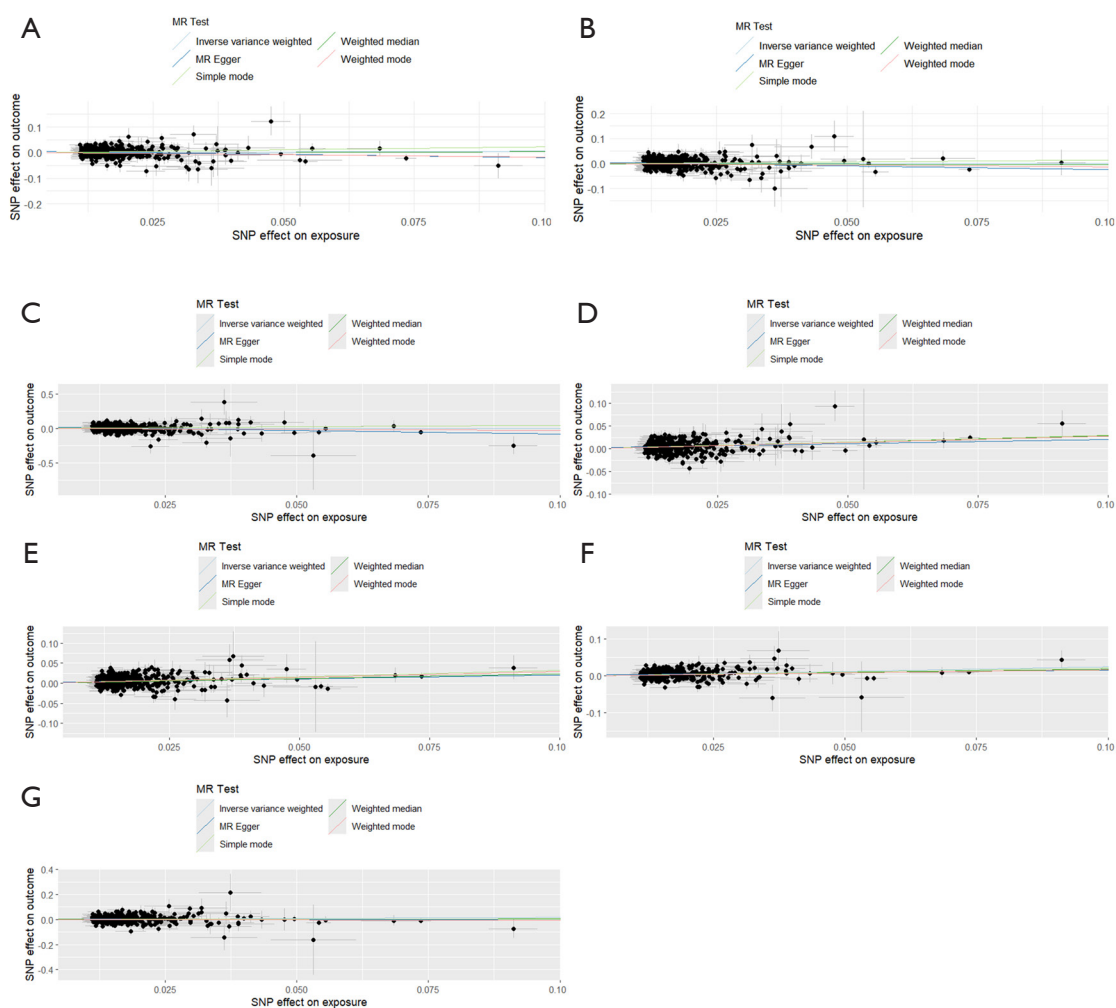


Figure S1 Scatter plots of the MR analysis of BMI and TMD-related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, low back pain or/and sciatica, pain in thoracic spine (A-G). Scatter plot showing the genetic correlations of BMI and chronic pain. The slopes of line represent the causal effect of each method (IVW, weighted median and MR Egger) respectively.

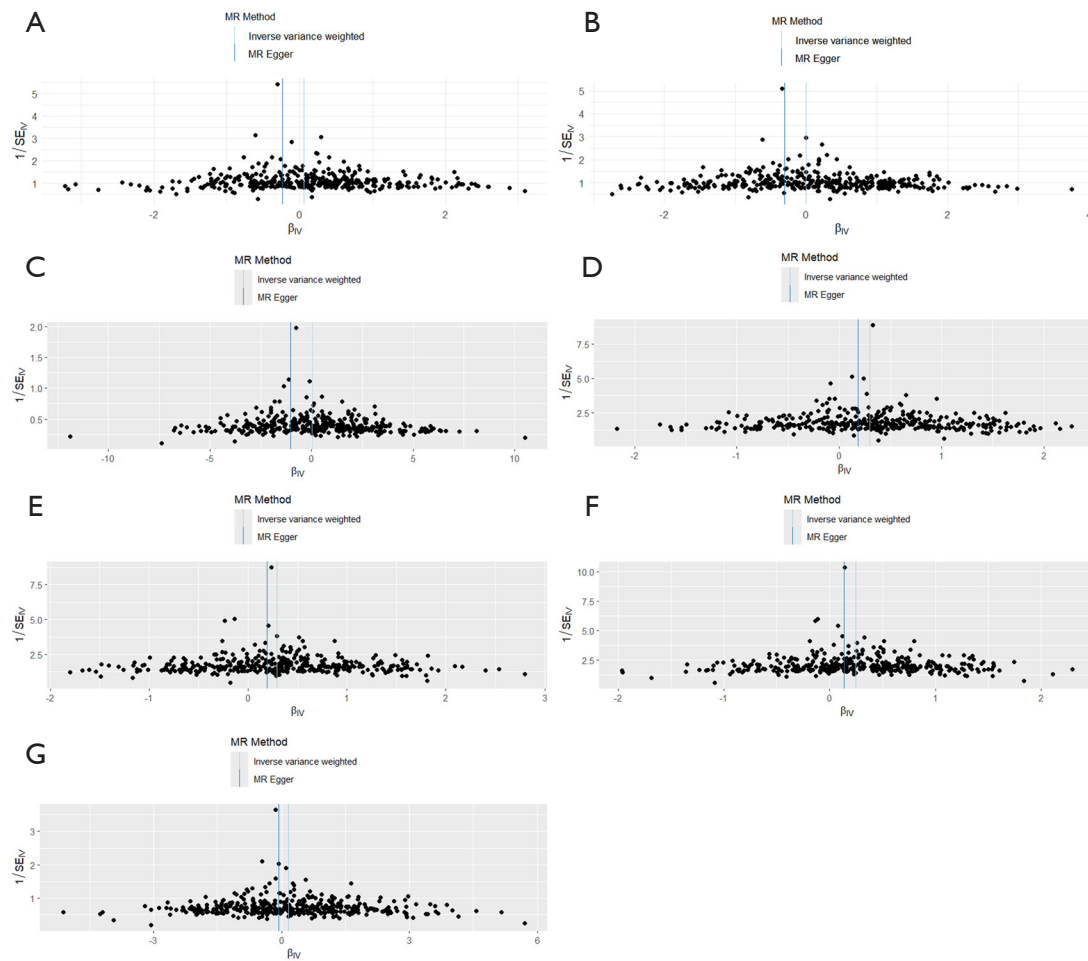


Figure S2 Funnel plots of the MR analysis of BMI and TMD-related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine (A-G). A funnel plot was applied to detect whether the observed association was along with obvious heterogeneity.



Figure S3 Leave-one-out analysis charts of the MR analysis of BMI and TMD-related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine (A-G). Leave-one-out analyses to evaluate whether any single instrumental variable was driving the causal effect.

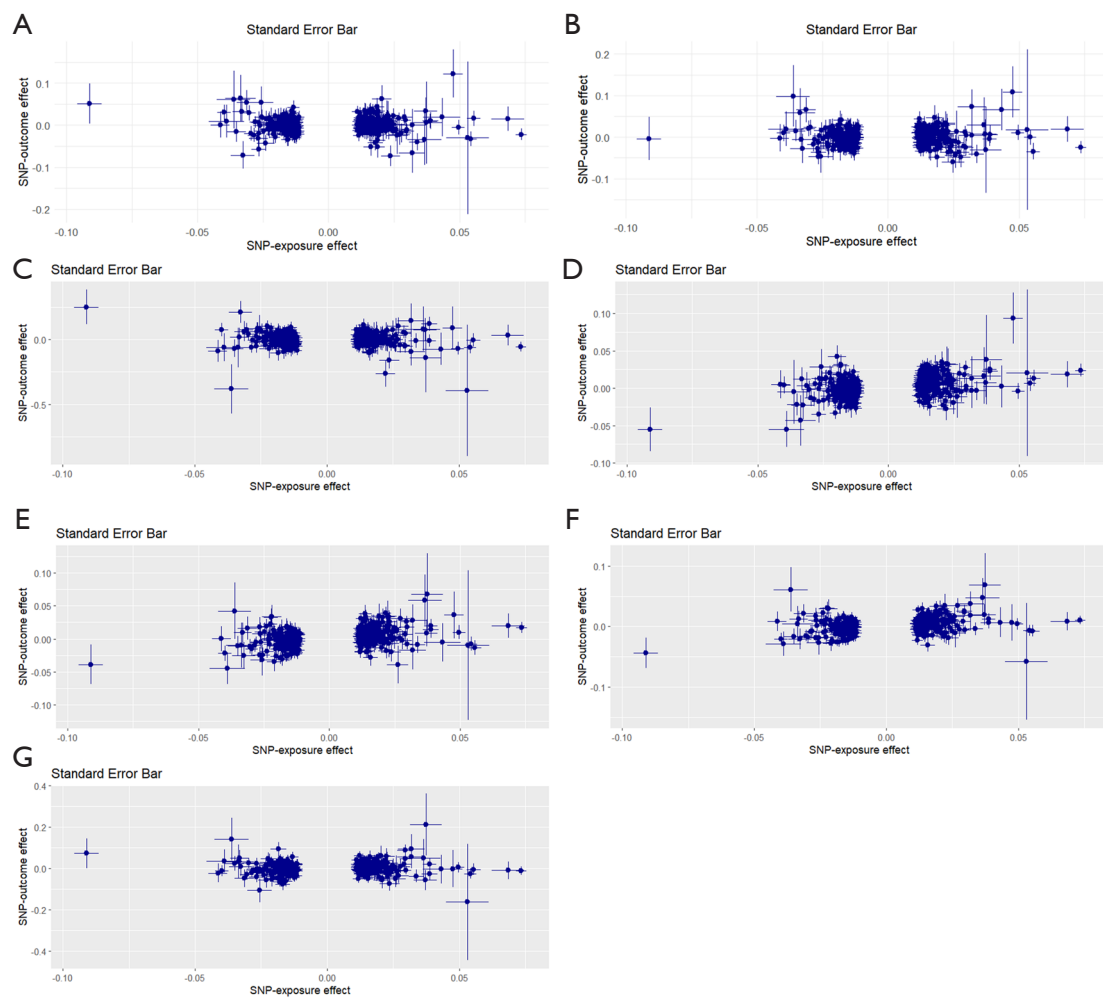


Figure S4 Scatter plots of the BWMR analysis of BMI and TMD-related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine (A-G). Scatter plot showing the genetic correlations of BMI and chronic pain.

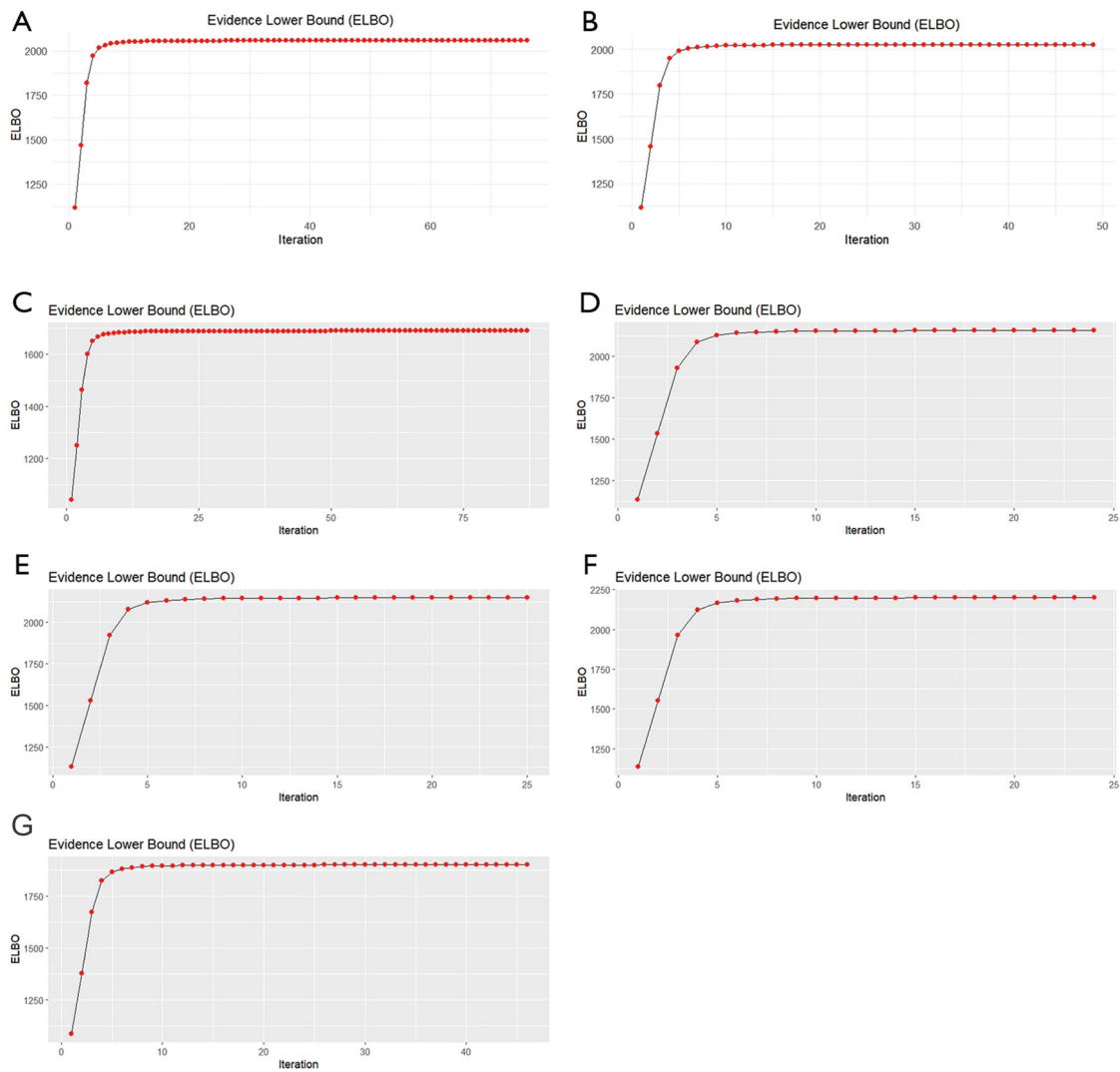


Figure S5 The change in the ELBO during the iterative process of the Bayesian-weighted MR analysis of BMI and TMD-related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, low back pain or/and sciatica, pain in thoracic spine (A-G). The final stable point of the ELBO value can be used as an indicator to evaluate the performance of the model. A higher ELBO value indicates that the model can better explain the data.

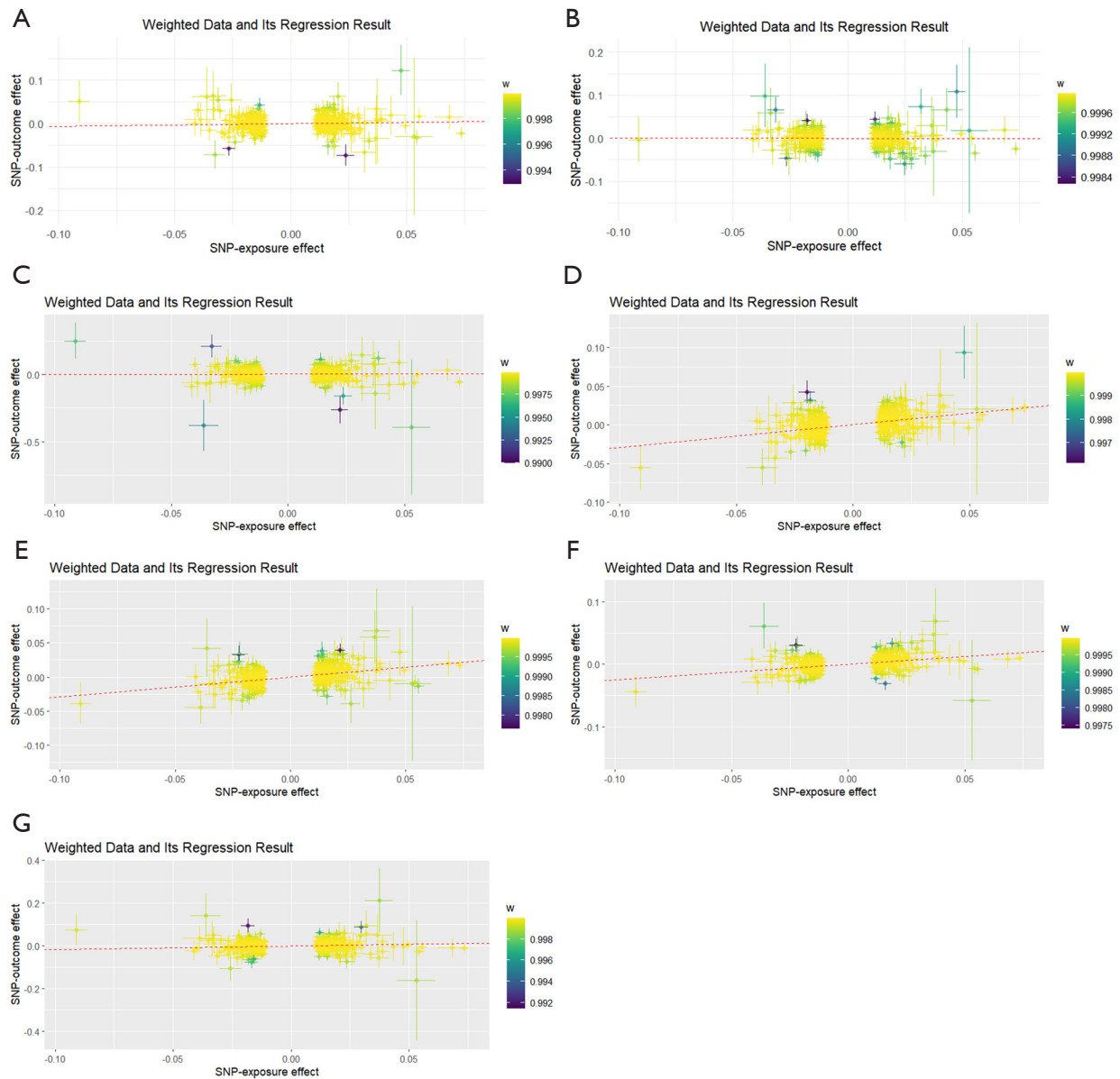


Figure S6 The weighted data and regression results of BWMR for BMI and TMD related pain, TMD muscular pain linked with fibromyalgia, atypical facial pain, pain in limb, low back pain, lower back pain or/and sciatica, and pain in thoracic spine respectively (A-G). Through weighted regression, the relationship between BMI and chronic pain is better revealed.

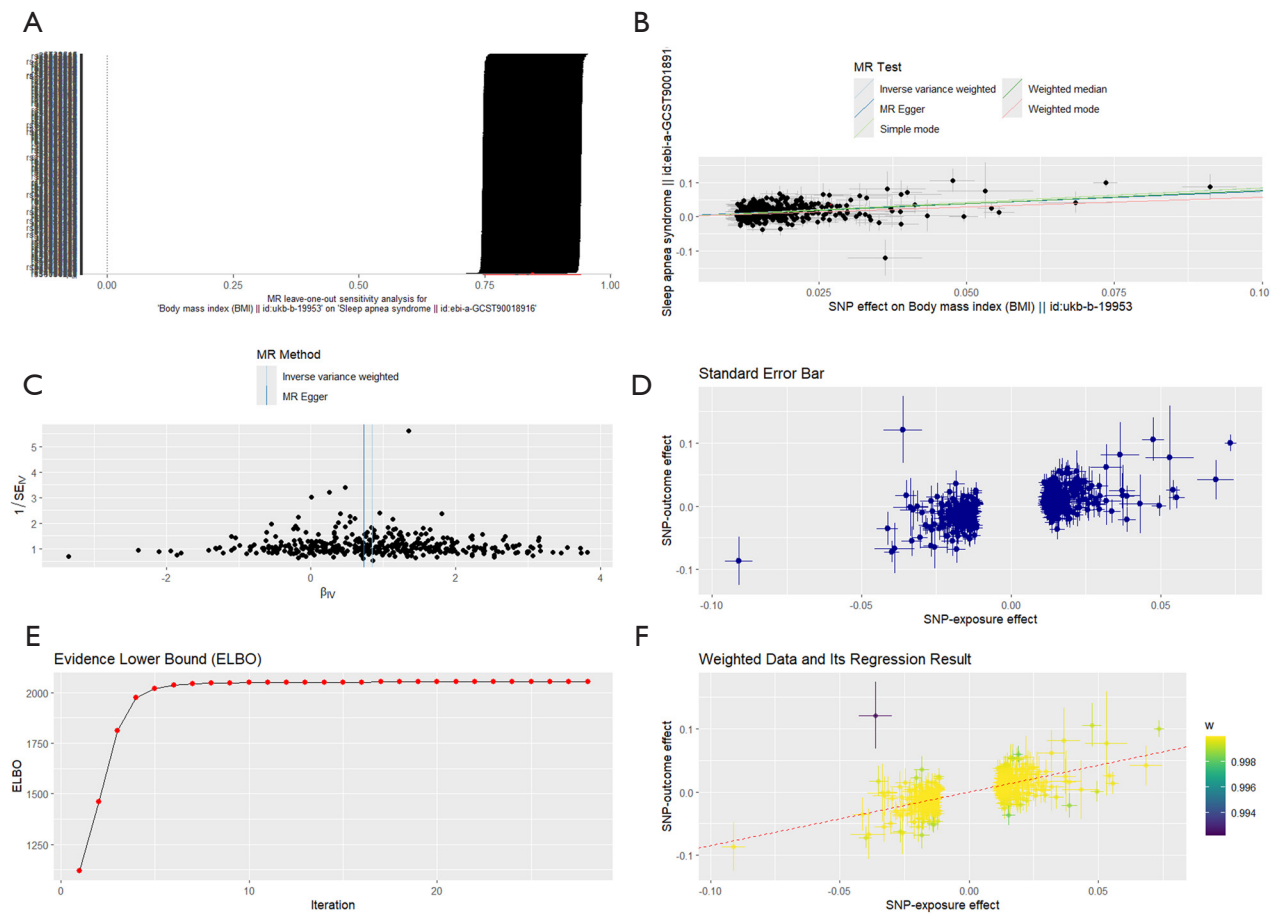


Figure S7 The results of MR analysis (A-C) and BWMR analysis (D-F) of BMI and sleep apnea syndrome.

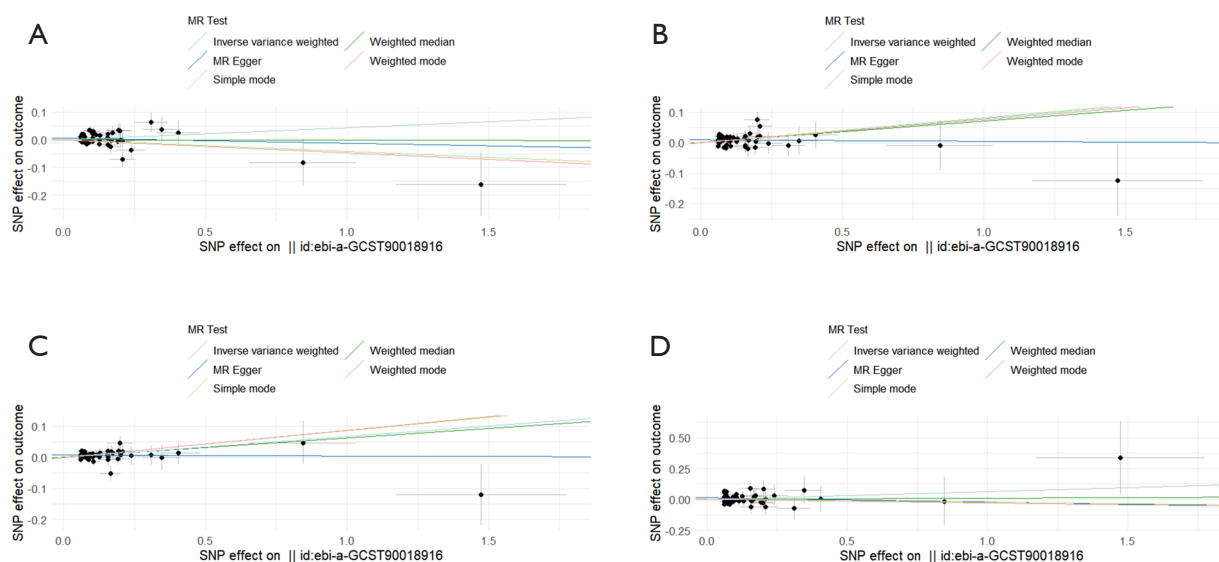


Figure S8 Scatter plots of the MR analysis of sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, pain in thoracic spine (A-D). Scatter plot showing the genetic correlations of sleep apnea syndrome and chronic pain. The slopes of line represent the causal effect of each method (IVW, weighted median and MR Egger) respectively.

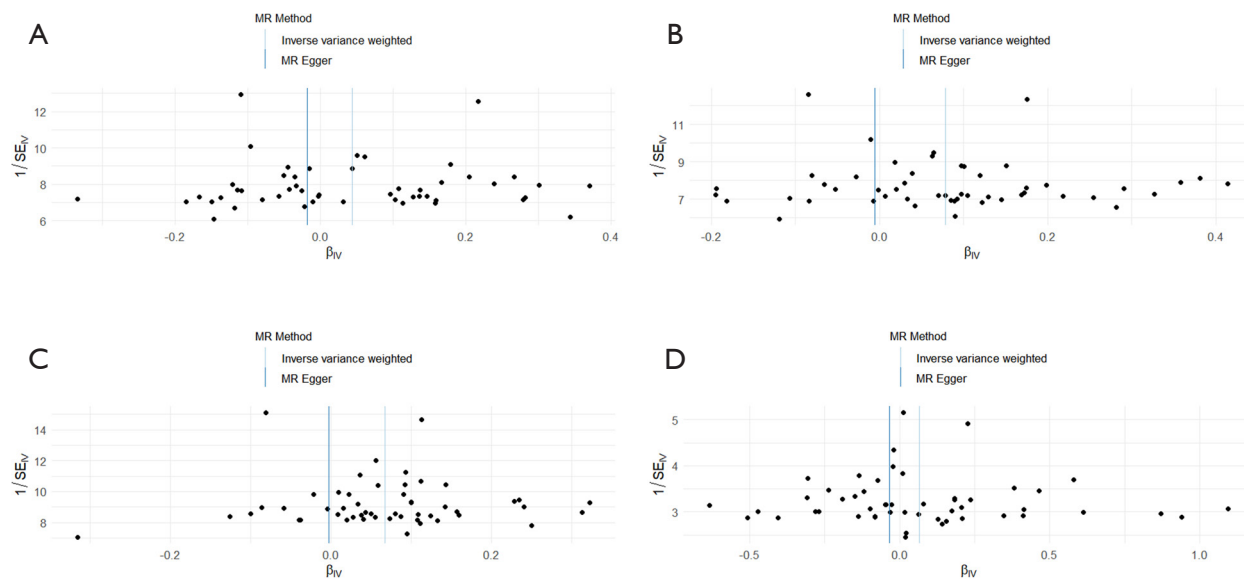


Figure S9 Funnel plots of the MR analysis of sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, pain in thoracic spine (A-D). A funnel plot was applied to detect whether the observed association was along with obvious heterogeneity.

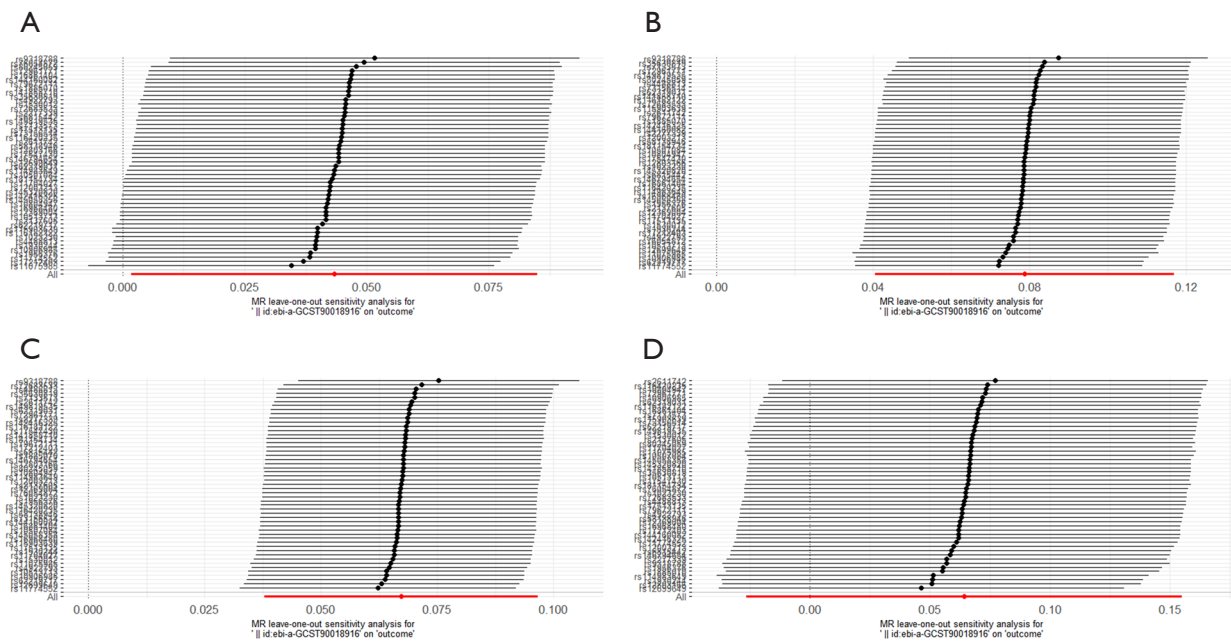


Figure S10 Leave-one-out analysis charts of the MR analysis of sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine (A-D). Leave-one-out analyses to evaluate whether any single instrumental variable was driving the causal effect.

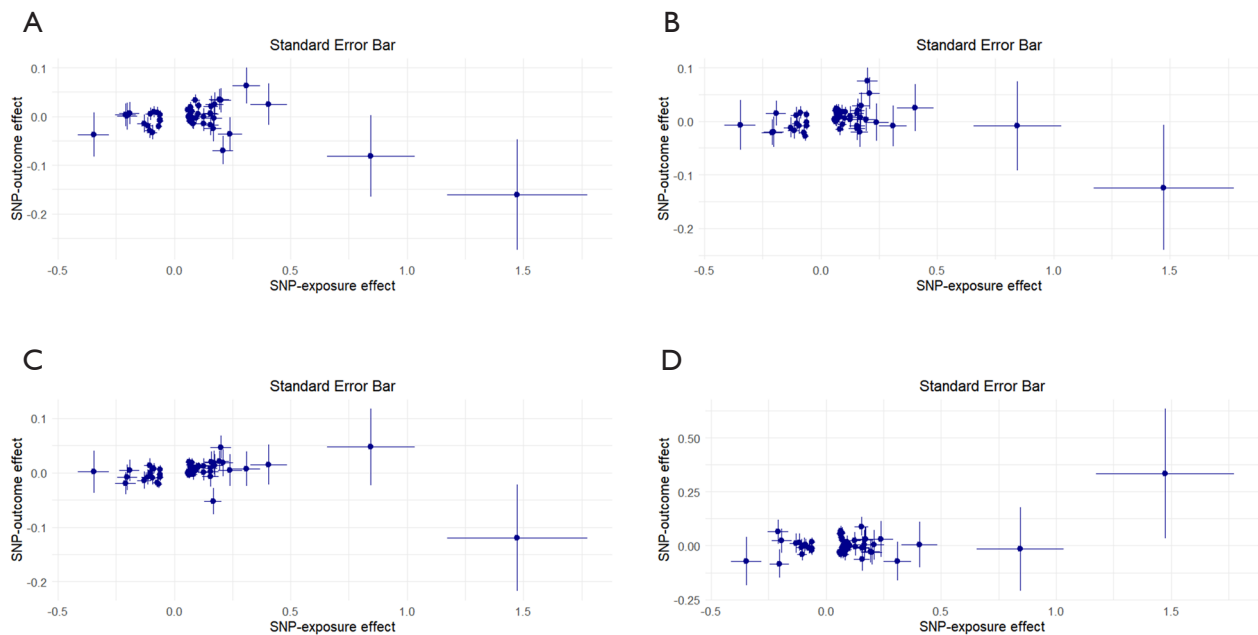


Figure S11 Scatter plots of the BWMR analysis of sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, pain in thoracic spine (A-D). Scatter plot showing the genetic correlations of sleep apnea syndrome and chronic pain.

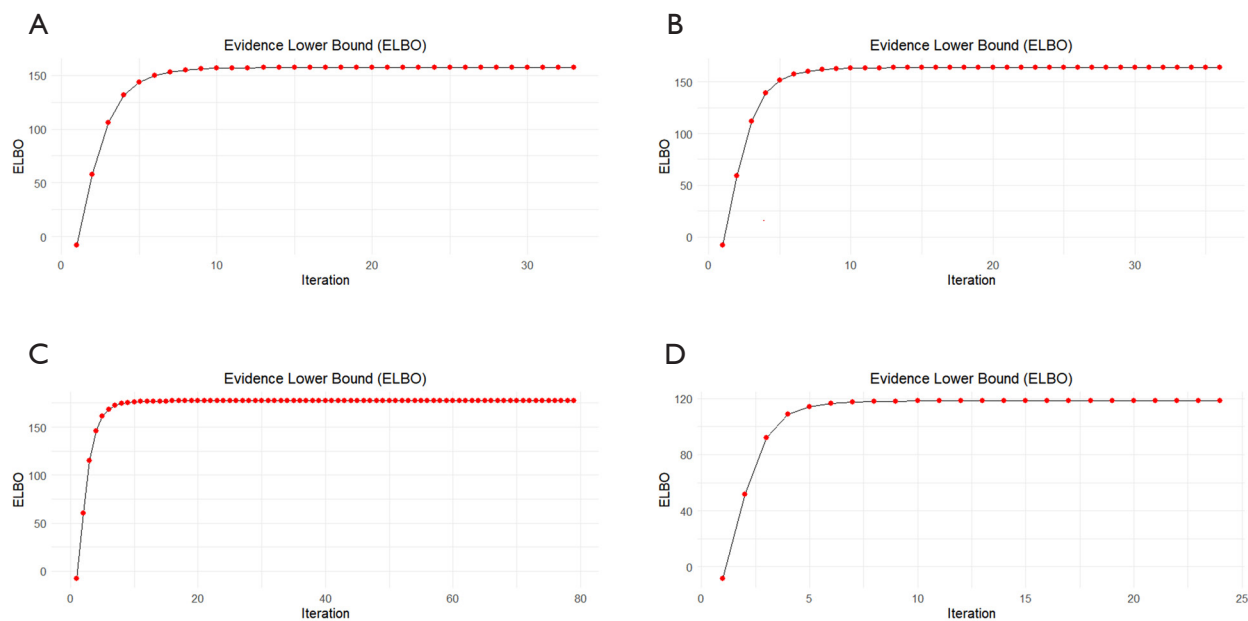


Figure S12 The change in the ELBO during the iterative process of the BWMR analysis of sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine (A-D). The final stable point of the ELBO value can be used as an indicator to evaluate the performance of the model. A higher ELBO value indicates that the model can better explain the data.

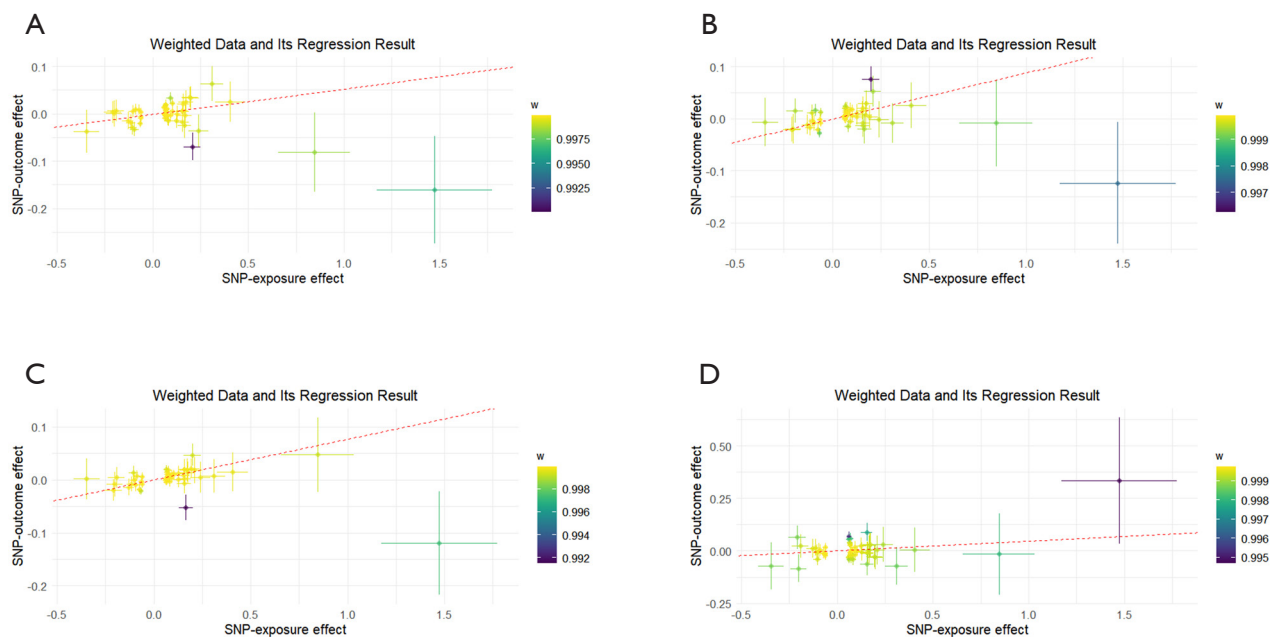


Figure S13 The weighted data and regression results of BWMR for sleep apnea syndrome and pain in limb, low back pain, low back pain or/and sciatica, and pain in thoracic spine respectively (A-D). Through weighted regression, the relationship between sleep apnea syndrome and chronic pain is better revealed.