Triple-negative breast cancer (TNBC), is defined by its lack of expression of estrogen receptor protein (ER), progesterone receptor protein (PR), and human epidermal growth factor receptor 2 (HER2), with characteristic features of early recurrence of disease and poor survival. We therefore aimed to identify differentially expressed genes in TNBC between African Americans and Caucasian TNBC patients to provide insight into gene dysregulation in TNBC and potential precision therapeutic targets for breast cancer treatment. Genes expression profiles of GSE142731 and GPL16791 were retrieved from <https://www.ncbi.nlm.nih.gov/geo/query/acc.cgi?acc=GSE142731> (NCBI's Gene Expression Omnibus (GEO)). Data analysis was done using Deseq2 package in Bioconductor and R programming language. A total of 750? and 850? genes expression were identified in GSE142731 and GPL16791 respectively after analysis. Validation of potential hub genes in the TCGA database was carried out using Cancer Genome Atlas (TCGA). The Protein–protein interaction (PPI) networks were identified using STRING (Search Tool for the Retrieval of Interacting Genes/Proteins). Also, the overall survival (OS) and relapse-free survival (RFS) analysis of hub genes was performed using a Kaplan–Meier plotter online tool. A total of 750? and 850? genes expression were identified in GSE142731 and GPL16791 respectively after analysis. After validation with the TCGA database, a total of 255? differentially expressed genes (DEGs) were identified between GSE142731 and GPL16791. Based on the STRING database, we constructed a PPI network using the DEGs obtained from the datasets. Furthermore, in the prognostic analysis of the 255 DEGs, we found that there were 15? genes associated with OS and 25? genes associated with RFS. In combination with the degree scores from the PPI network, a total of 15? genes with the highest degree scores were selected as hub genes related to TNBC. This research provides an insight into the network of biomarkers related to TNBC, which could be useful for therapeutic insight and precision medicine among African American and Caucasian TNBC patients.