Nitrogen K-edge EXAFS measurements are used to study the effect of N+ and O+ implantation in the microstructure of GaN. In the as-grown sample the central N atom is four-fold coordinated with 3.35 Ga atoms at the expected distance of 1.93Å, and 0.65 displaced to a distance longer by ~0.33Å. Implantation with either N or O ions enhances the distortion in the microstructure and the number of the displaced Ga atoms increases from 0.65 to 1. The enhancement of the distortion in the coordination number is attributed to the generation of excess N vacancies. In addition to that, implantation causes a reduction in the nearest neighbor distances by about 2% and an increase of the Debye-Waller factors.