The ground state properties of the extended Hubbard model with transverse (XY-type) spin-exchange interaction ($J_{xy}$) are studied. The case of ferromagnetic ($J_{xy} > 0$) and antiferromagnetic ($J_{xy} < 0$) exchange couplings are considered. The analysis of the model is performed for $d$-dimensional hypercubic lattices, including $d = 1$ and $d = \infty$, by means of the (broken symmetry) Hartree-Fock approximation and, for $d = \infty$, by the slave-boson mean-field method. Some rigorous results derived for the strong coupling regime of the model for $d = 1$ are also presented. At half filling the ground state phase diagram for $d = 1$ is shown to consist of ten different phases, including site and bond located antiferromagnetic (SDW) and charge density wave (CDW) states, ferromagnetic XY (F) state, the superconducting s-wave (SS) and p-wave (TS) states, as well as several mixed phases with coexisting site and bond orderings. For $d = \infty$ the corresponding diagram is simpler and consists of the phases involving exclusively site located orderings. The obtained phase diagram for $d = 1$ is in agreement with results of recent studies based on the continuum-limit approach and the density-matrix renormalization group method.