Healthcare systems face several challenges due to the aging workforce, recruitment shortages, increasing patient acuteness, and increasing patient size and weight. The most costly, leading, and prevalent problem in the healthcare industry and nursing professions is work-related Musculoskeletal Disorders (MSDs). MSDs are common among caregivers because of the nature of their work, which requires repetitive heavy physical activity. The development of MSDs among caregivers negatively impacts the quality of care, and incurs high costs such as worker compensation, days away from work, turnover, rehabilitation, and lower productivity. Therefore, it is essential to determine the factors that contribute to musculoskeletal disorder injuries among caregivers, in order to reduce or eliminate risks within healthcare environments which might cause such ramifications. This dissertation develops a framework to identify risk factors for MSDs and to determine which ones show significant contribution to be included in a developed predictive model. The data was obtained from caregivers who work in Saudi Arabian healthcare institutions, with 104 participating nurses to determine which risk factors would be included in the predictive model. Logistic regression analysis was used to investigate the association of the identified work related and non-work related risk factors for musculoskeletal disorders in healthcare organizations among caregivers. The development of the predictive model provides insights into risk factors which can guide the development of policies and recommendations to reduce and eliminate the development of MSDs among caregivers.