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Economic Impact and Benefits of Integrating Augmented Reality Technology in the Healthcare Industry: A Systematic Review

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Abstract : Augmented reality (AR) in the healthcare industry has been gaining popularity in recent years, principally in areas of medical education, patient care and digital health solutions. One of the drivers in deciding to invest in AR technology is the potential economic benefits it could bring for patients and healthcare providers, including the pharmaceutical and medical technology sectors. Works of literature have shown that the benefits and impact of AR technologies have left trails of achievements in improving medical education and patient health outcomes. However, little has been published on the economic impact of AR in healthcare, a very resource-intensive industry. This systematic review was performed on studies focused on the benefits and impact of AR in healthcare to appraise if they meet the founded quality criteria so as to identify relevant publications for an in-depth analysis of the economic impact assessment. The literature search was conducted using multiple databases such as PubMed, Cochrane, Science Direct and Nature. Inclusion criteria include research papers on AR implementation in healthcare, from education to diagnosis and treatment. Only papers written in English language were selected. Studies on AR prototypes were excluded. Although there were many articles that have addressed the benefits of AR in the healthcare industry in the area of medical education, treatment and diagnosis and dental medicine, there were very few publications that identified the specific economic impact of technology within the healthcare industry. There were 13 publications included in the analysis based on the inclusion criteria. Out of the 13 studies, none comprised a systematically comprehensive cost impact evaluation. An outline of the cost-effectiveness and cost-benefit framework was made based on an AR article from another industry as a reference. This systematic review found that while the advancements of AR technology is growing rapidly and industries are starting to adopt them into respective sectors, the technology and its advancements in healthcare were still in their early stages. There are still plenty of room for further advancements and integration of AR into different sectors within the healthcare industry. Future studies will require more comprehensive economic analyses and costing evaluations to enable economic decisions for or against implementing AR technology in healthcare. This systematic review concluded that the current literature lacked detailed examination and conduct of economic impact and benefit analyses. Recommendations for future research would be to include details of the initial investment and operational costs for the AR infrastructure in healthcare settings while comparing the intervention to its conventional counterparts or alternatives so as to provide a comprehensive comparison on impact, benefit and cost differences.

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