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Shaping the Future of Surgery: A Scoping Review of Current Robotic Practices and Perspectives in Saudi Arabia

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ADMINISTRATIVE INFORMATION

Support - N/A.

Review Stage at time of this submission - The review has not yet started.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 12 December 2024 and was last updated on 12 December 2024.

INTRODUCTION

Review question / Objective The review question was formulated in accordance with the PCC (Population, Concept, Context) framework to delineate the current status of robotic-assisted surgeries (RAS) in Saudi Arabia. This encompasses an examination of their utilization, clinical outcomes, challenges, and the perceptions of healthcare professionals.
P: articles published in Saudi Arabia that focus on patients undergoing RAS, as well as the healthcare professionals involved in these procedures.
C: Utilization, Outcomes, Challenges, and Perceptions Associated with RAS.
C: Healthcare Facilities, Clinical Practices, and Surgical Specialties in Saudi Arabia.

Background The emergence of RAS can be traced back more than five decades. However, its utilization and application began in the 1980s with the introduction of Robodoc, developed by Hap Paul and William Bargar at Integrated Surgical Systems in Sacramento. This system was employed as an imaging tool for prosthetic hip replacement procedures [1]. In the same decade, the Programmable Universal Machine for Assembly 200 (PUMA 200) was developed, which was utilized for neurosurgical biopsies and subsequently integrated into urological procedures [2].
Saudi Arabia has established itself as a leader in the Middle East in the integration of RAS. The initial implementation of RAS in the country took place in 2003 with the installation of the da Vinci robotic system [3]. Presently, there are 16 da Vinci robotic systems installed in major hospitals throughout the nation, where they have significantly advanced the field of urology,

becoming an integral component of surgical practice within this specialty [4].

Rationale There exists uncertainty in the current literature regarding the status of RAS within the surgical domain in Saudi Arabia. This uncertainty encompasses various dimensions, including the overall current integration of RAS, clinical outcomes, associated challenges, and the perceptions of healthcare professionals. Consequently, the aim of this scoping review is to provide a comprehensive overview and updates on the advancements in RAS, as well as to identify the deficiencies in the evidence-based literature pertaining to this topic in Saudi Arabia.

METHODS

Strategy of data synthesis This scoping review will follow the five-step framework proposed by Arksey and O'Malley, which has been further refined by Levac and colleagues [5, 6]. The steps involved are: (1) Identifying the research questions, (2) Identifying relevant studies, (3) Selecting studies, (4) Extracting data, and (5) Collating, summarizing, and reporting the results. Furthermore, this scoping review will utilize the PRISMA extension for scoping reviews (PRISMA-ScR) [7]. The initial step is outlined in the "Review Question / Objective" section. In the subsequent phase, articles will be searched within the specified databases, with the details regarding the identification of relevant studies provided in the "Source of Evidence Screening and Selection" section, utilizing the predetermined keywords. The identified articles will then be transferred to Rayyan, a digital platform, to eliminate duplicates and facilitate double-blind selections of studies. Following this, two independent reviewers will individually assess the titles and abstracts to select studies that meet the inclusion criteria while excluding those deemed irrelevant. In cases where the relevance of a study is in doubt, the reviewer will examine the full text to ascertain its appropriateness. A third reviewer will be consulted to resolve any discrepancies between the reviewers until a consensus is achieved. A second selection phase will commence by evaluating the full text of the included studies and extracting the required data.

Eligibility criteria Articles included in the scoping review must be relevant to the subject matter, which encompasses RAS in Saudi Arabia. This includes the current status, utilization, clinical outcomes, challenges, and perceptions of healthcare professionals. All forms of evidence will be considered for inclusion in the scoping review, including, but not limited to, cohort studies, cross-sectional studies, and case studies. However, review studies and grey literature will be excluded from this scoping review. It is imperative that all articles are available in full text; those that are not will be excluded from consideration. There are no restrictions regarding the publication date of the research studies. Articles must be published in English to be included in this scoping review.

Source of evidence screening and selection A comprehensive search will be conducted across six databases: PubMed, Medline, Web of Science, ScienceDirect, Google Scholar, and EBSCO. This search will utilize keywords relevant to the subject matter and geographic location. Keywords will be employed both individually and in combinations, utilizing Boolean operators such as AND and OR. The search strategy will not be confined solely to the keywords; it will also incorporate citation tracking and the selective inclusion of pertinent articles.

Data management Rayyan platform will be employed for data management.

Reporting results / Analysis of the evidence Not applicable.

Presentation of the results The extracted data will be presented in a descriptive manner. Furthermore, graphs and tables will be employed to summarize and illustrate the findings.

Language restriction Articles written in English will be exclusively included.

Country(ies) involved Saudi Arabia.

Keywords robotic, robot, da vinci, surgery, surgical, surg, Saudi, ksa, general, thoracic, obstetric, gynecology, orthopedic, urologic, dental, maxillofacial, cardiac, transplant.

Dissemination plans This scoping review does not require ethical approval from the Institutional Review Board (IRB). The findings of this scoping review will be submitted to relevant conferences and pertinent journals.

Contributions of each author

Author 1 - Abdulaziz Saleem - The author will engage in the screening phase as the first reviewer responsible for selecting the studies to be included and will also contribute to the preparation of the final manuscript.
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Author 2 - Mohammed Alhazmi - The author will participate in the identification of pertinent studies, manage the data utilizing the Rayyan AI platform, and prepare the final manuscript.
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Author 3 - Moaz Abulfaraj -The author will participate in the screening phase as the second reviewer tasked with selecting the studies for inclusion.
Email: mabulfaraj@yahoo.com
Author 4 - Ahmed Aljeraisi - The author will be tasked in the identification of relevant studies.
Email: ahmedaljeraisi@gmail.com
Author 5 - Murad Aljiffry - The author will oversee the entire study, serve as a third reviewer responsible for resolving discrepancies between the first and second reviewers in the selection of studies, and participate in the preparation of the final manuscript.
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