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Invited Editorial

Orthopaedic Research Output from Sri Lanka Amidst its Healthcare Challenges

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R. Vaishya[1],
A. Vaish[1],
K. Pathinathan[2],

1: Department of Orthopaedics, Indraprastha Apollo Hospitals, New Delhi 110076, India

2 Base Hospital Kalmunai, Kalmunai, Sri Lanka

- Dr. Raju Vaishya MBBS, MS, Mch (Liverpool), FRCS (Lond), FACS(USA), Department of Orthopaedics and Joint Replacement Surgery Indraprastha Apollo Hospitals, New Delhi 110076, India
- Dr. Abhishek Vaish MBBS, MS, Orth, Mch (MIS), Dip Sicot, DNB(Ortho), MNAMS Email : drabhishekvaish@gmail.com)
- Dr. Kalaventhan Pathinathan MBBS, MD (Ortho),Consultant Orthopaedic Surgeon Email : kalavenathansurgery@gmail.com, ORCID 0000-0002-0482-6200
- **Corresponding Author:**

  Dr (Prof.) Raju Vaishya
  Email: raju.vaishya@gmail.com

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Background

Sri Lanka is a South Asian country belonging to the South Asian Association for Regional Cooperation (SAARC) It has a population of approximately 22 million, and is a developing country, ranking 73rd on the Human Development Index[1] . It is the highest-ranked South Asian nation in terms of development, has the second-highest per capita income in this region and the highest literacy rate of all the developing nations[2].

Sri Lanka has made significant strides in providing accessible and affordable healthcare to its citizens. It has achieved remarkable progress over the past few decades in improving key health indicators, such as infant mortality rates and life expectancy[3]. While Sri Lanka's public healthcare system has made significant strides, it faces challenges, including limited funding and resources, disparities in access to care, and the burden of non-communicable diseases (NCDs). Recently, Sri Lanka faced a severe political and economic crisis, putting the health system at risk of collapsing[4].

Orthopaedic Research in Sri Lanka

We explored the landscape of research in Orthopaedics and Sports Medicine of Sri Lanka, from the SICmago website, where the bibliometric data of the Scopus database is available from 1996 to 2023 and updated as of April 2023[5].

Sri Lankan pulications have been cited in Scopus since 2004, and since then have been gradually contributing to the world literature, reaching double figures in citations since 2019with 12 papers cited in 2022 (Figure 1). Its contribution to the world literature in Orthopedics and Sports Medicine has not yet been substantial, with a global share of only 0.01%. Its share among SAARC nations has been 1.03% (104 out of 10052 publications).

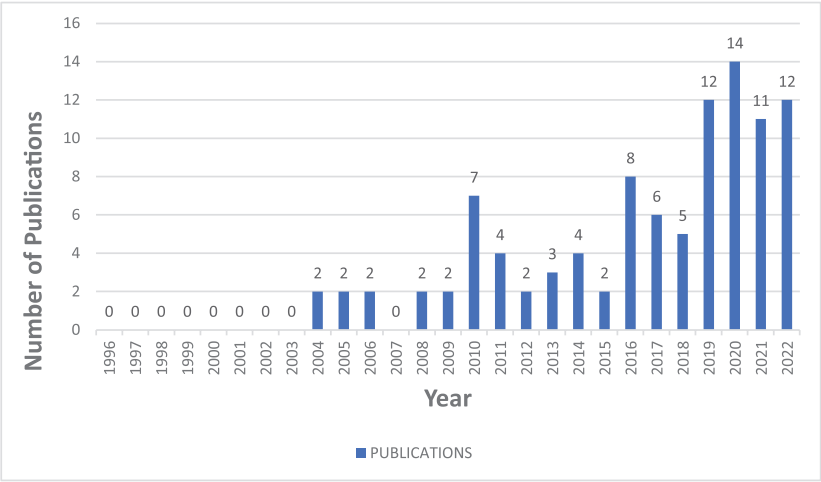

Figure 1: Publications in Orthopaedics and Sports Medicine from Sri Lanka from 1996 to 2022 (Source: SCImago[5])

In the cumulative period from 1996 to 2022, its global ranking in terms of publications was the 85th out of 199 countries, and among Asian countries, it was 15 out of 30 countries, and among the 8 SAARC nations, Sri Lanka was ranked 4, after India, Pakistan and Nepal (Table 1). It is to be noted that Sri Lanka registered the highest citations per document of 42.29 among all the SAARC nations, indicating that its good-quality publications had a higher impact than the other SARRC nations' publications. Sri Lanka has also registered a higher ranking in the research output in Orthopaedics and Sports Medicine, than some of the bigger SAARC nations like Bangladesh and Afghanistan.

Table 1: Comparative bibliometrics parameters of SAARC nations in Orthopaedic and Sports Medicine publications from 1996 to 2023 (Source: SCImago[5])

Country	SAARC Rank	Asian Rank	Region	Total Documents	Total Citations	Self-Citations	Citations Per Document	H-index
India	1	4	SAARC	10333	96538	15694	9.34	95
Pakistan	2	11	SAARC	375	3880	536	10.35	31
Nepal	3	13	SAARC	205	2286	95	11.15	22
Sri Lanka	4	15	SAARC	117	4948	92	42.29	23
Bangladesh	5	16	SAARC	87	1722	84	19.79	17
Afghanistan	6	22	SAARC	17	150	6	8.82	7
Maldives	8	26	SAARC	5	44	0	8.8	3
Bhutan	7	29	SAARC	5	16	0	3.2	2

Orthopaedic research in Sri Lanka so far has focussed on trauma management. Gobyshanger et al. reported that Road Traffic Accidents (RTA) account for 25,000 injuries annually and 10 deaths daily in Sri Lanka[6]. They noted a recent 85% increase in road traffic fatality rates. Hence, five northern Sri Lankan provinces developed a local electronic trauma registry to register the epidemiological data of RTA victims, identify the injury mechanisms, establish priorities for prevention and patient care, and introduce the concept of an organised system to this region. Fischer et al. also observed an escalating epidemic of trauma-related injuries due to RTAs and armed conflicts[7]. This trauma occurs predominantly in rural areas where most of the population live. The authors have suggested prevention programs, improved healthcare facilities, and training of competent healthcare providers to combat this epidemic. Apart from fractures related to RTAs, there is an increasing trend of osteoporotic hip fractures in Sri Lanka which is lower compared with other countries, but the numbers are likely to increase from the current 10 per day to around 33 in 2051[8].

Current Status and History of Orthopaedic Surgery in Sri Lanka

Sri Lanka Orthopaedic Association (SLOA) was established in 1992 by Dr. J.K.S. Weerasekara and Dr Upali Banagala. Since then SLOA has been actively involved in training surgeons, continuous professional educational activities, infrastructure development and postgraduate education. It started with ten members and has grown to more than 100 members. The Sri Lanka Journal of Orthopaedic Surgery (SLJOS) was launched in June 2008 by Dr Upali Banagala[9].

The postgraduate training and education are governed by the Postgraduate Institute of Medicine (PGIM), University of Colombo, Sri Lanka under the guidance of the Specialty Board in Orthopaedic Surgery. The postgraduate training starts with a competitive selection examination (Pre-MD Selection examination) and is followed by four and a half years of pre-MD training in Orthopaedic surgery. Trainees sit the MD examination in Orthopaedic surgery and then have one year of local Post-MD training. The postgraduate training ends with two years of fellowship training and the board certification will bebeing awarded by the PGIM after the evaluation of the whole training process.

Research output in Orthopaedics from SAARC nations

Research output in orthopaedics from SAARC nations has increased in recent years[11], reflecting the growing interest in orthopaedic research in the region. While each country has its own unique healthcare challenges and research priorities, collaboration and

knowledge sharing within the SAARC region can be instrumental in advancing orthopaedic research and improving patient care. Such collaborations can be been facilitated through joint research projects, academic exchanges, and scientific conferences. Platforms such as the regional and national orthopaedic associations provide opportunities for networking, knowledge sharing, and collaborative research initiatives. These partnerships have enabled researchers to leverage collective expertise and resources, ultimately benefiting patients across SAARC countries[12,13,14].

Technological advancements have also played a significant role in shaping orthopaedic research output globally15. Sri Lanka (and other SAARC nations) should also explore the applications of digital health technologies, including telemedicine, mobile health apps, and wearable devices, to improve patient monitoring, rehabilitation, and postoperative care. Innovations in implant design, surgical instrumentation, and computer-assisted surgery should be explored to better clinical outcomes.

Challenges and Limitations

Despite its recent successes, biomedical research in Sri Lanka faces several challenges[15]. Limited funding remains a major constraint, hindering the scale and scope of research projects. Additionally, infrastructure deficiencies and a shortage of skilled personnel pose significant barriers to conducting high-quality research. Brain- drain further exacerbates these challenges, as talented researchers seek opportunities abroad due to limited career prospects and inadequate support within the country.

Future Directions

As Sri Lanka continues to evolve, so too must its healthcare system. Addressing the challenges facing the public sector requires concerted efforts from policy-makers, healthcare professionals, and the community at large. Investments in infrastructure, human resources, and health education are essential to strengthen the resilience and sustainability of Sri Lanka's healthcare system. Furthermore, there is a need to foster collaboration between the public and private sectors to enhance healthcare access and quality while ensuring equity and affordability. Public-private partnerships can leverage the strengths of both sectors to address gaps in service delivery and promote innovation in healthcare delivery models. By implementing the above-mentioned suggestions, Sri Lanka can continue its journey towards achieving better health outcomes and improving the well-being of its people.

Despite the challenges, Sri Lanka remains poised to make significant contributions to biomedical research in the future. Investments in research infrastructure, capacity building, and international collaborations are essential for accelerating progress in key areas such as precision medicine, genomics, and regenerative medicine. Initiatives to retain and attract talent within the country are critical for nurturing a vibrant research culture.

Conclusion

Biomedical research in Sri Lanka has come a long way, driven by the dedication and ingenuity of its researchers. Over the two decades, Sri Lankan researchers have built upon this foundation to address pressing health challenges and contribute to global scientific knowledge. Through collaboration, innovation, and strategic investments, Sri Lanka has the potential to further advance scientific knowledge, improve healthcare outcomes, and contribute to global health equity. By addressing existing challenges and embracing emerging opportunities, Sri Lanka can solidify its position as a leader in biomedical research in the years to come.

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