RESEARCH ARTICLE

Trend of anaesthesia research from SAARC countries. A decade's bibliographic analysis of indexed journals of Pakistan

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Abstract

Objective: To evaluate the contribution of member countries of the South Asian Association for Regional Cooperation towards anaesthesia research.

Method: The retrospective study was conducted at Department of Anaesthesia, Aga Khan University, Karachi from January 2018 to June 2018 and comprised literature search to identify published articles related to anaesthesia, critical care and pain research contributed by authors from member countries of the South Asian Association for Regional Cooperation region and published in Pakistani indexed journals between January 2007 and December 2016. Data was analysed using SPSS 19.

Results: Of the 183 articles extracted, 179(97.8%) were contributed from Pakistan and 4(2.2%) from India. Overall, there were 50(27%) randomised controlled trials, 38((20%) case reports and 36(19.5%) observational studies. There was 1(0.5%) collaborative study involving researchers from two member countries.

Conclusions: The contribution to anaesthesia, critical care and pain research was not ideal from the member countries of the South Asian Association for Regional Cooperation.

Keywords: South Asia, Research, Anaesthesiology, Pakistan. (JPMA 72: 2038; 2022)

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Introduction

The South Asian Association for Regional Cooperation (SAARC) was established in 1985 to organise and unite the region to promote overall progress and development. The region constitutes 21% of the world population and comprises eight countries; Pakistan, India, Bangladesh, Maldives, Sri Lanka, Afghanistan, Bhutan and Nepal. All these countries face common healthcare challenges that are different from those of the developed world in both nature and extent. However, there is a lack of available large-scale medical, surgical and anaesthetic data which could be used to create guidelines and protocols in keeping with the region's expertise, finances and resources. The total research output and global share of the South Asian region is only 3% compared to the entire world.[1] The exchange of ideas, optimisation of each other's strengths and resources, and building solid collaborative ties will help achieve the region's goals and establish sustainable choices within the domain of ethics and equity.[2] Collaboration for research among countries in the region is also minimal. It was reported in 2015 that out of all collaborative research involving South Asia, only 2.2% was at the regional level.[3] The status of scientific research in the field of anaesthesia, pain and critical care contributed by SAARC members countries published in the indexed journals of Pakistan has not been investigated. The current study was planned to fill the gap by quantifying and analysing the type of research in the field of anaesthesiology contributed by authors from SAARC countries and published in indexed journals of Pakistan.

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Materials and Methods

The retrospective study was conducted at Department of Anaesthesia, Aga Khan University, Karachi from January 2018 to June 2018 and comprised literature search between January 2007 and December 2016. The computerised literature search was conducted after retrieval of a complete list of medical journals published in Pakistan from Pakmedinet, which is the largest medical database in Pakistan.[4] Five national journals currently indexed in PubMed are: Journal of Ayub Medical College (JAMC), Journal of College of Physicians and Surgeons of Pakistan (JCPSP), Journal of Pakistan Medical Association (JPMA), Pakistan Journal of Medical Sciences (PJMS) and Pakistan Journal of Pharmaceutical Sciences (PJPS). Research related exclusively to anaesthesiology and its subspecialties pain and intensive care contributed by authors of all the eight SAARC countries published in the 5 indexed journals of Pakistan. owing to the nature of the study, sample size calculation was not required.

The home page of each journal was accessed, and then past issues or archives were searched to extract information regarding authors and articles. Two authors

examined each issue of each journal independently. Data was recorded on predesigned Excel worksheets.

Data noted included journal's name, article title, year and month of publication, country of publication, working place of the corresponding author, whether teaching or non-teaching institution, publication type and subspecialty of publication. The subspecialties were counted as general anaesthesia, which was further subclassified into cardiac, neurology, paediatrics, regional, ear-nose-throat (ENT), eye, ambulatory, orthopaedics, general surgery, gynaecology and obstetrics, urology, etc. The pain subspecialty was subclassified as acute or chronic, while the third subspecialty was intensive care/critical care.

The publication type was classified as original articles, including randomised controlled trials (RCTs) and observational studies, editorials, review articles, audits, case reports or series and letters to editor/correspondence.

Articles published in collaboration with another SAARC country or with countries outside the SAARC region were separately identified.

Clinical relevance of RCTs and observational studies applicable to SAARC countries was also documented based on the originality of work and the baseline data pertinent to the region or relating to clinical problems pertinent to anaesthesia practice in the region. Simple replication of the studies published before elsewhere was not considered original.

The data compiled by the two reviewers was compared for accuracy and missing information or any discrepancy. No ethical issues were identified in the study.

Data was analysed using SPSS 19. Frequency and percentages were computed for categorical data, and country-wise, year-wise and subspecialty distribution analysis was done.

Results

Of the 183 articles extracted, 179(97.8%) were contributed from Pakistan and 4(2.2%) from India. There was no article published in PJSP, while the highest number of articles published were in JPMA 81(44.3%)

Table-1: Anaesthesia articles according to the year of publication in indexed journals from Pakistan.

Year of Publication	Journal of Pakistan Medical Association	Journal of College of Physicians and Surgeons of Pakistan	Journal of Ayub Medical College	Pakistan Journal of Medical Sciences	Pakistan Journal of Pharmaceutical Sciences	Total n=183
2007	20 (10.9%)	8 (4.4%)	4 (2.2%)	3 (1.6%)	0	35(19.1%)
2008	10 (5.5%)	6 (3.3%)	5 (2.7%)	0	0	21(11.5%)
2009	10 (5.5%)	9 (4.9%)	6 (3.3%)	0	0	25(13.7%)
2010	8 (4.4%)	4 (2.2%)	7 (3.8%)	0	0	19(10.4%)
2011	9 (4.9)	5 (2.7%)	3 (1.6%)	0	0	17(9.3%)
2012	7 (3.8%)	8 (4.4%)	2 (1.1%)	0	0	17(9.3%)
2013	7 (3.8%)	5 (2.7%)	1 (0.5%)	0	0	13(7.1%)
2014	3 (1.6%)	1 (0.5%)	3 (1.6%)	1 (0.5%)	0	08(4.4%)
2015	2 (1.1%)	8 (4.4%)	2 (1.1%)	1 (0.5%)	0	13(7.1%)
2016	5 (2.7%)	3 (1.6%)	4 (2.2%)	3 (1.6%)	0	15(8.2%)
Grand Total	81(44.3%)	57(31.1%)	37(20.2%)	8(4.4%)	0	183 (100%)

Table-2: Types of publications.

Publication Type	Journal of Pakistan Medical Association (n=81)	Journal of College of Physicians and Surgeons of Pakistan (n=57)	Journal of Ayub Medical College (n=37)	Pakistan Journal of Medical Sciences (n=8)	Total (n=183)
Letters to the Editor	4 (2.2%)	4 (2.2%)	0	0	8(4.4%)
Editorials	2 (1.1%)	2 (1.1%)	0	0	4(2.2%)
Short Communications	6 (3.3%)	0	0	1 (0.5%)	7(3.8%)
Case Reports	21 (11.5%)	17 (9.3%)	0	0	38(20.8%)
Case Series	3 (1.6%)	1 (0.5%)	4 (2.2%)	2 (1.1%)	10(5.5%)
Audits	7 (3.8%)	1 (0.5%)	2 (1.1%)	1 (0.5%)	11(6.0%)
Surveys	4 (2.2%)	1 (0.5%)	1 (0.5%)	0	6(3.3%)
Observational Studies	13 (7.1%)	7 (3.8%)	14 (7.7%)	2 (1.1%)	36(19.5%)
Quasi-Experimental	0	3 (1.6%)	1 (0.5%)	0	4(2.2%)
Randomised Controlled Trials	15 (8.2%)	20 (10.9%)	14 (7.7%)	1 (0.5%)	50(27.3%)
Review Articles	6 (3.3%)	1 (0.5%)	1 (0.5%)	1 (0.5%)	9(4.9%)

Table-3: Anaesthesia-related randomised controlled trials (RCTs) and observational studies.

Institutions	Observational studies	Randomised Controlled Trials	Total n=86
AKUH	20 (23.3%)	16 (18.6%)	36 (41.9%)
AMC	2 (2.3%)	5 (5.8%)	7 (8.1%)
ARMF	4 (4.7%)	11 (12.8%)	15 (17.4%)
DUHS	1 (1.2%)	6 (7.0%)	7 (8.1%)
HMC	0	2 (2.3%)	2 (2.3%)
JPMC	1 (1.2%)	0	1 (1.2%)
LNH	1 (1.2%)	3 (3.5%)	4 (4.7%)
LUMHS	3 (3.5%)	1 (1.2%)	4 (4.7%)
MIKD	0	1 (1.2%)	1 (1.2%)
NICVD	1 (1.2%)	0	1 (1.2%)
NWGH	1 (1.2%)	0	1 (1.2%)
PIMS	1 (1.2%)	3 (3.5%)	4 (4.7%)
PNS	1 (1.2%)	0	1 (1.2%)
RMIP	0	2 (2.3%)	2 (2.3%)
Grand Total	36 (41.9%)	50 (58.1%)	86 (100%)

AKUH: Aga Khan University Hospital; AMC: Ayub Medical College; ARMF: Armed Forces based institutes; DUHS: Dow University of Health Sciences; HMC: Hayatabad Medical Complex; JPMC: Jinnah Postgraduate Medical Center; LNH: Liaquat National Hospital; LUMHS: Liaquat University of Medical and Health Sciences; MIKD: Multan Institute of Kidney Diseases, Multan - Pakistan; NICVD: National Institute of Cardio Vascular Diseases; NWGH: Northwest General Hospital and Research Centre, Peshawar, Pakistan; PIMS: Pakistan Institute of Medical Sciences; PNS: PN Shifa; RMPI: Rehman Medical Institute Peshawar.

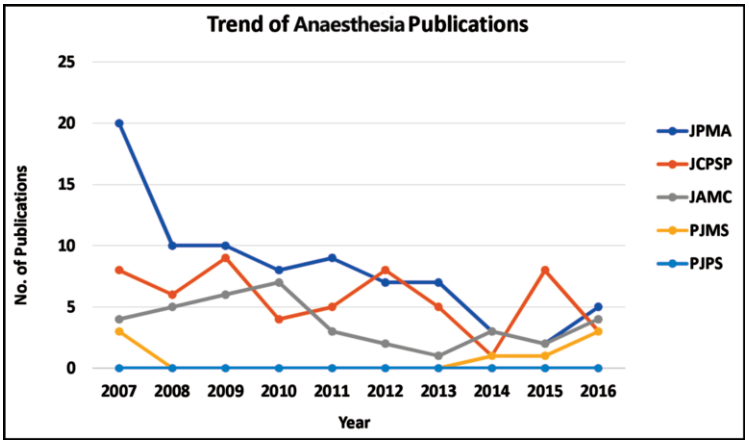

Figure: Trend of anaesthesia publications in indexed Pakistani journals.
JPMA: Journal of Pakistan Medical Association, JCPSP: Journal of College of Physicians and Surgeons of Pakistan, JAMC: Journal of Ayub Medical College, PJMS: Pakistan Journal of Medical Sciences, PJPS: Pakistan Journal of Pharmaceutical Sciences.

(Table-1). However, the trend compared to the baseline was downward (Figure).

Overall, there were 50(27%) RCTs, 38((20%) case reports and 36(19.5%) observational studies. The highest number of RCTs were published in JCPSP 20(40%) (Table-2).

With respect to the 86(47%) RCTs and observational studies, the Aga Khan University Hospital (AKUH), Karachi, led the field with 36(41.9%); 20(55.5%) observational studies and 16(44.4%) RCTs (Table-3). There was no research contribution from district headquarter hospitals (DHQs).

Of the 179(97.8%) published articles from Pakistan, 132(73.7%) were contributed from Sindh, and 79(44.1%) of them were published in JPMA (Table-4).

There were 30(16.4%) collaborative papers. Of these, 23(76.7%) publications were the outcome of collaboration within the same country, 6(20%) publications had one or more authors from outside the SAARC member countries. There was 1(3.3%) collaborative study involving researchers from two SAARC member countries, India and Nepal, who worked in collaboration with a Spanish institution, and this was published in PJMS in 2007.

Discussion

Publication is an important measure of advancement in scientific research. The geographical distribution of publications in the discipline of anaesthesiology and its subspecialties varies across the globe. South Asian countries have similar issues, including challenges in the health sector. The countries in this region are all low and middle-income countries (LMICs). The gross domestic product (GDP) allocated to health varies from 3.2% to 7.65%, which is substantially lower than in high-income countries (HICs).[5] Economic development has previously shown to improve research output.[6] A survey of scientific publications identified that countries with rapid economic growth, such as China and India, markedly increased their rankings between 1997 and 2001.[7]

Table-4: Publications from different provinces of Pakistan.

	Journal of Pakistan Medical Association	Journal of College of Physicians and Surgeons of Pakistan	Journal of Ayub Medical College	Pakistan Journal of Medical Sciences	Total n=179
Pakistan	81 (45.3%)	54 (30.2%)	37 (20.7%)	7 (3.9%)	179 (100%)
Sindh	79 (44.1%)	32 (17.9%)	16 (8.9%)	5 (2.8%)	132(73.7%)
Punjab	2 (1.1%)	17 (9.5%)	8 (4.5%)	1 (0.6%)	28(15.6%)
Khyber Pakhtunkhwa	0	4 (2.2%)	13 (7.3%)	1 (0.6%)	18(10.1%)
Balochistan	0	1 (0.6%)	0	0	1(0.6%)

Health research expenditure in South Asian countries continues to be very low; within the region it is highest in India, followed by Pakistan and Nepal. Most of the collaborations in these countries are with the developed world. Regional collaborations in research is only around 2%.[3] Healthcare issues and challenges are similar across South Asia. This means that regional collaboration in research should be more relevant and mutually beneficial than collaboration with the developed world.

Top academic institutions of each SAARC country have to play their role in initiating collaborative research. This may also be a reason why less research from these countries is published in the developed world, as some of the challenges faced in South Asia may not be of interest to the scientific community in the developed world. This was noted by a study done to assess South Asian countries' contribution to the top five high-indexed anaesthesia journals between 2000 and 2015. There was no publication from Bangladesh, Afghanistan, Bhutan and Maldives, and the overall contribution was suboptimal.[8]

The current bibliographical analysis showed the contribution of South Asian countries to research in anaesthesiology and its subspecialties published in the five indexed journals of Pakistan, and the results showed that very little research from SAARC countries was being published in Pakistan. India has two anaesthesia journals that are indexed in PubMed, and this may be the reason why very few papers from India appeared in Pakistani journals. Other SAARC countries do not have indexed anaesthesia journals. A few years ago, an attempt was made to start a SAARC Journal of Anaesthesia, but lack of funds came in the way. There is also a need to collaborate with centres in HICs that are keen on supporting/improving research in LMICs. The Scientific Committee of the World Federation of Societies of Anaesthesia (WFSA) can help in bringing about these liaisons where research departments in HICs may provide research mentorship to anaesthesia departments in LMICs.

Other than collaboration, the overall research output from South Asia is around 20 times lower than the global average. However, there is light at the end of the tunnel as per capita increase in research papers was high in South Asia compared to the global average between 2005 and 2015.[3]

The estimated population of Pakistan is approximately 225 million, which makes it the fifth most populous country in the world.[9] There are 176 medical and dental institutions in Pakistan, out of which only 62 are supported by the government, while the others are in the private sector.[10] The low research output in indexed journals in Pakistan reflects either less research being done or publication of research in non-indexed journals. The Pakistan Medical Commission (PMC) allows research in some non-indexed journals to be considered for institutional promotion and maintains a list of these journals. However, in Pakistan, there is only one non-indexed anaesthesia speciality journal being published, titled Anaesthesia, Pain and Intensive Care (APICARE), which has four issues per year.[4] The small number of articles published in Pakistani indexed journals reflects a trend of poor research output. The reasons could be several, like lack of a set of national priorities for research, insufficient expertise of the existing faculty in research methodology and therefore a lack of mentors, non-availability of healthcare facilities and lack of suitable infrastructure for developing a culture of research.[11]

The backbone of research is data. One way to promote research is to encourage the collection and record of anaesthesia data. It should be made part of everyday practice in all institutions. Although this requires additional expense, it has value in education and improving the culture of patient safety. Another important factor is the education of research. Most medical schools in the region do not include research methodology in their curriculum. Education and training should be made part of a medical school's curriculum and residency training programmes.

Another way of promoting research is to conduct research-related workshops and dispersing ideas of utilising hospital data for research purposes. The formation of a quality committee in each institution could be a starting point in leading research related to safety. Linking teaching hospitals with peripheral hospitals can help the latter to utilise data in research and its dissemination.

As noted in the current study, regional collaboration is deficient even though there are several areas in anaesthesiology where such collaboration may benefit the entire region. For this, top academic institutions of each SAARC country have to play their role in initiating collaborative research.

One of the requirements in some SAARC countries, like Pakistan, Bangladesh and India, is to write a dissertation before the higher diploma examination. Taking the example of Pakistan, approximately 300-350 anaesthesia candidates appear in their higher diploma examination annually. JCPSP preferentially publishes papers based on these dissertations, but looking at the numbers of anaesthesia candidates who appear in the final exam, the

number of anaesthesia publications in JCPSP is significantly less. This is lost research. The visibility of this can be improved by making it mandatory to convert these dissertations into research papers.

Interestingly, there were very few audits reported in this data. An audit is a simple type of research that helps to identify weaknesses in the health system and suggests improvement in practices. This would be relatively easy to do in the smaller district and peripheral hospitals. This will also improve the quality of care and safety of patients in these hospitals. Variations in the research output were also seen among different institutions. The highest publications came from AKUH. The reason may be that the culture of research in the institution was established since its inception. Promotion guidelines for faculty require research published in internationally indexed journals.

In the current study, there were very few publications on regional and paediatric anaesthesia. There was also scanty research on equipment and systems used in anaesthesia. Although the research was relevant to the practice of anaesthesia in the region, probably low interest or finances may be the reason for the low research output in the subspecialities of anaesthesia.

The limitation of the current study is the selection bias of the journals. It only included indexed journals from Pakistan and did not include the non-indexed anaesthesia journals. As such, it may not have captured all anaesthesia publications. The reason for this exclusion was that research published in non-indexed journals has limited visibility.

Conclusion

Anaesthesia contribution from South Asia to the PubMed indexed journals of Pakistan was generally poor. The majority of papers were from Pakistan, with a small contribution from India. The type of research being done also needs a review. Training in audits and quality-based research should be encouraged. There is a strong need to establish a culture of research in the region and to develop collaboration among SAARC member countries.

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