

EMERGENCY MEDICINE RESEARCH IN PAKISTAN: A SCOPING REVIEW ABOUT THE PUBLICATION TRENDS AND QUALITY ANALYSIS OF EVIDENCE

Rida Jawed, Umaira Aftab, Salman Muhammad Soomar, Shahzad Waheed

Department of Emergency Medicine, Aga Khan University Hospital, Karachi - Pakistan

ABSTRACT

Background: This study examines trends in emergency medicine research published in Pakistan from 2012 to 2021. We aimed to identify research gaps and areas needing further investigation.

Materials & Methods: We searched online databases (PubMed, CINAHL, Cochrane, EBSCO) for studies related to emergency medicine in Pakistan published between January 2012 and December 2021. Studies were included if they were published in English, peer-reviewed, and focused on emergency medicine in Pakistan. Two reviewers assessed eligibility and study quality.

Results: One hundred fifty articles were included in the review out of 871 that met the eligibility criteria. A significant portion of these articles was published in 2020, accounting for 22.7% of the total, followed by 2016 and 2017, which together contributed 12%. Conversely, 2021 had the fewest publications, with only 1.3% of studies released. During this period, the most common study design was the cross-sectional design, representing 40.7% of all studies, while mixed-methods and qualitative studies were the least common, each accounting for 1.3%. Regarding risk of bias, 48% of the studies were assessed as having a moderate level, and 50% were identified as having a high risk of confounding factors. Overall, approximately 80% of the articles were classified as having predominantly moderate quality. The primary focus of the cross-sectional and cohort studies, as well as case reports, was on Infectious Diseases. Notably, a mixed-methods study on Violence and Trauma was published in 2021, and a qualitative study from 2015 examined ethical considerations.

Conclusion: This scoping review emphasizes the prevalence of cross-sectional study designs and themes related to infectious diseases in Pakistani emergency medicine research, with most articles rated as moderate quality. Future research should focus on understudied areas, including social determinants of health, resource-limited settings, and cost-effectiveness analyses.

Keywords: Scoping, review, emergency medicine, Scoping Review

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INTRODUCTION

The College of Physicians and Surgeons approved Emergency Medicine training in Pakistan in 2010, with residency programs commencing in 2011 at Aga Khan University Hospital, Karachi, and Shifa International Hospital, Islamabad.^{1,2}

Since then, approximately twenty-six institutions have been accredited for residency training in this field. As more institutions launch residency programs,

there is a corresponding increase in the number of publications and research in emergency medicine. Given the significant research opportunities in this area, our goal is to evaluate the current literature in Pakistan, focusing on the characteristics, clinical factors, and quality that influence emergency care publications.

The main goal of this scoping review is to summarize existing literature on various emergency medicine topics studied by practitioners in Pakistan and to categorize the types of research conducted on each subject. A thorough review of recent studies is performed to compare them with earlier research, highlighting evolving trends and shifting focus areas over time.

This review emphasizes the overall significance of various medical and social factors within their temporal and social contexts. Categorizing Pakistani emergency medicine research will help identify potential areas for future investigation. This study aims to evaluate the trends and quality of emergency medicine publications in Paki-

Correspondence

Dr. Rida Jawed

MBBS Resident

Department of Emergency Medicine, Aga Khan University Hospital, Karachi - Pakistan

Cell: +92-3???????????

Email: rida.jawed@aku.edu

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stan over the past decade.

MATERIALS & METHODS

A comprehensive literature review was conducted to identify research articles published in the field of Emergency Medicine (EM) in Pakistan. The goal was to evaluate the trends and quality of EM publications over a ten-year period, from January 2012 to December 2021. The online databases used for this research included PubMed, CINAHL, Cochrane, and EBSCO.

The search criteria included terms such as Emergency Medicine, Accident and Emergency, Trauma, Pakistan, Critical Care, Violence, Injury and Prevention, Emergency Medicine Systems, Disaster, Injury Surveillance, Emergency Department registries, Trauma Registries, Child Abuse, School Health, Deliberate Self-Harm, Resuscitation, Sepsis, and Emergency Airway Management, used both individually and in combination.

Eligibility criteria included all peer-reviewed articles published in English that were observational, experimental, qualitative, reviews, or commentaries/communications, provided they contained the term “Emergency/Emergency Medicine” in their titles. These studies needed to be conducted within the Emergency Department of a healthcare facility in Pakistan or authored by a practicing Emergency Medicine physician based in Pakistan.

Two evaluators reviewed the articles against the established eligibility criteria. They thoroughly examined the title, abstract, and full text to assess the risk of bias and potential confounding factors, where applicable. The quality of each article was evaluated using a standardized criterion that employed quality indicators rated on a Likert scale, categorized as follows: 1. Weak, 2. Moderate, and 3. Strong. Relevant details, including author, year, study design or article type, study topic or theme, and study quality, were documented. Frequencies and percentages were calculated to determine the overall quality of the publications.

RESULTS

A total of 893 articles were initially identified, with 22 duplicates removed prior to the screening process. Ultimately, 150 articles were selected for inclusion in the review from the remaining 871, in accordance with the established eligibility criteria, as illustrated in Figure 1.

Out of the 871 articles, 531 did not meet the inclusion criteria during the initial review. Then, additional articles were excluded after reviewing the title, abstract, and full text, resulting in 40, 102, and 48 exclusions, respectively. This process led to the final selection of 150 articles.

Figure 2 displays the distribution of publication years, showing that most articles were published in 2020

(n = 34; 22.7%), followed by 2016 and 2017 (n = 18; 12% combined). Other notable years include 2013 (n = 15; 10%), 2015 (n = 14; 9.3%), and 2014 (n = 12; 8%). The fewest studies were published in 2021 (n = 2; 1.3%).

Figures 3, 4, 5, and 6 show that the most common study design was cross-sectional (n = 61; 40.7%), while the least common was mixed-methods/qualitative (n = 2; 1.3%). Concerning the risk of bias, nearly half of the studies were rated as moderate (n = 72; 48%), and half of the included articles showed a substantial risk of confounding (n = 75; 50%). Overall, the quality of the studies was mainly rated as moderate (n = 120; 80%).

Figure 7 shows the quality assessment of 19 case reports published in Pakistan’s Emergency Department from 2012 to 2021. Between 2014 and 2017, all nine reports were rated as moderate. Most of the other reports were also classified as moderate, although three reports from 2021 (n = 5) were rated as strong. In 2020, only one of the five reports fell into this category, while one report was considered weak.

Our data analysis showed that case reports were spread across various specialties, with Neurology (n = 4) and Infectious Diseases (n = 5) leading in publication count. Meanwhile, other specialties had fewer reports.

Figure 8 shows a total of 61 cross-sectional studies conducted from 2012 to 2021. The period from 2012 to 2016 produced 29 studies of moderate quality. In 2017, out of eight studies, two were classified as strong, and a similar pattern appeared in 2020 (n = 13) and 2021 (n = 6), where one study in each year was rated as strong. Conversely, in 2018 (n = 2), 2019 (n = 3), and 2020, one study each was categorized as weak, while the rest were rated as moderate.

Regarding the thematic focus of the studies, nearly one-fourth (n = 27) of the cross-sectional studies focused on Infectious Diseases, followed by Psychiatry (n = 5), Pulmonology (n = 5), and Internal Medicine (n = 4). Cardiology and Emergency Medical Services each contributed a single article; however, the limited dataset introduces some uncertainty.

Table 1 presents data from 16 Cohort Studies published between 2012 and 2018, with no publications from 2019 to 2021. All the studies were rated as moderate in quality. In subsequent years, five case-control studies were conducted: two in 2013, one in 2015, one in 2019, and one in 2020. Quality assessments showed that one study was rated both as strong and weak, while the others were rated as moderate.

The themes of the Cohort studies spanned various specialties, including Internal Medicine, Toxicology, Cardiology, Oncology, Trauma, and Intensive Care. Infectious Diseases, particularly in the pediatric population (n = 7), were the most common focus. Conversely, all case-control studies examined environmental exposures and their impact on the population.

Figure 9 illustrates that there were a total of 8 randomized control trials (RCTs), with 2 published in 2013, 5 in 2020, and only 1 in 2021. The 2021 trial is classified as strong in terms of quality, while the others are deemed moderate.

The majority of these RCTs focus on the effectiveness of various treatments for sepsis in pediatric populations, except for one trial that pertains to obstetrics.

Table 2 shows that one mixed-methods study was published in 2021 and one qualitative study in 2015, both rated as moderate in quality. The mixed-methods study covers issues related to violence and trauma, while the qualitative research focuses on ethical considerations.

The remaining data, as shown in Table 3, identify 33 unique categories of publications, including commentaries (n=12), prospective studies (n=3), retrospective studies (n=10), clinical audits (n=1), communications

(n=2), reviews (n=3), and surveys (n=3), published between 2013 and 2021. Regarding quality, four publications are classified as strong, 7 as weak, and the rest as moderate. The covered themes include a subtle influence of research (n=3), infectious diseases (n=3), and several topics that are both directly and indirectly related to emergency medicine (n=6).

DISCUSSION

In general, Cross-sectional research designs were predominantly employed in the studies reviewed, with infectious diseases and psychiatry emerging as the most frequently addressed subjects. The overall quality of the studies was found to be average, although there were notable exceptions on both ends of the quality spectrum.

A significant finding from the scoping study is the limited number of investigations conducted in Pakistan's rural and underdeveloped areas. Most of the identified studies were centered in urban tertiary care facilities, highlighting the urgent need to enhance research initiatives in marginalized and rural regions, where access to emergency medical services may be inadequate or entirely lacking.

Another important observation is the lack of established protocols and standards for emergency medical practices in Pakistan. This underscores an urgent need to develop and implement evidence-based guidelines that

Table 1: Quality of Cohort and case control studies in ER

Area of study/Theme	Study design	Quality of Publication	Year of publication
Infectious Disease/pediatric	Prospective Cohort	Moderate	2017
Cardiology	Prospective Cohort	Moderate	2016
Pediatric Oncology	Prospective Cohort	Moderate	2016
Trauma	Prospective Cohort	Moderate	2016
Pediatrics Medicine	Prospective Cohort	Moderate	2015
Intensive Care / Pediatrics.	Prospective Cohort	Moderate	2015
Emergency/internal medicine	Prospective Cohort	Moderate	2015
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2013
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2012
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2012
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2018
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2018
Pediatrics / infectious diseases	Prospective Cohort	Moderate	2020
Trauma checklist In Emergency Department.	Prospective Cohort	Moderate	2020
Internal Medicine	Prospective Cohort	Moderate	2016
Environment/neurology	Prospective Cohort	Moderate	2018
Environment/oncology	Case control	Moderate	2015
Environment/oncology	Case control	Moderate	2013
Environment/pulmonology/ pediatric	Case control	Moderate	2013
Environment/oncology	Case control	Strong	2020
Environment/oncology	Case control	Weak	2019

Table 2: Mixed-method & Qualitative studies in ER

Area of study/Theme	Study design	Quality of Publication	Year of publication
Violence and Trauma	Mixed Method	Moderate	2021
Ethics	Qualitative	Moderate	2015

Table 3: Other studies published in emergency literature

Area of study/Theme	Study design	Quality of Publication	Year of publication
Internal Medicine	Commentary	Moderate	2017
Triaging	Commentary	Strong	2017
Internal Medicine /Obstetrics	Commentary	Moderate	2016
Pediatrics/ Emergency	Commentary	Moderate	2016
Pediatrics/ Emergency	Commentary	Moderate	2016
Emergency Medicine	Commentary	Moderate	2016
Research	Commentary	Moderate	2014
Research	Commentary	Strong	2014
Ethics and Practices	Commentary	Moderate	2016
Internal Medicine	Commentary	Moderate	2016
Pediatrics	Commentary	Moderate	2021
Infectious Diseases	Commentary	Moderate	2020
Internal Medicine	Prospective Study	Weak	2021
Urology	Prospective	Weak	2020
Pulmonology	Prospective test validation study	Moderate	2018
Delay admission from Emergency Department	Retrospective study	Moderate	2016
Trauma/ Pediatrics	Retrospective study	Moderate	2017
Traumatic Brain Injury	Retrospective observational	Moderate	2015
Emergency/internal medicine	Retrospective study	Moderate	2014
Toxicology	Retrospective, case series	Moderate	2013
Emergency medicine	Retrospective Study	Moderate	2013
Emergency/internal medicine	Retrospective study	Strong	2020
Endocrinology / Internal Medicine	Retrospective study	Moderate	2019
Traumatic Brain Injury	Retrospective study	Weak	2019
Patient flow and crowding in Emergency Department	Retrospective study	Weak	2019
Cardiology	Clinical Audit	Moderate	2015
Psychology	Communication	Weak	2017
Leadership/Emergency Medicine	Communication	Weak	2017
Infectious diseases	Review	Moderate	2016
Research in ED	Review	Moderate	2015
Internal medicine	Review	Strong	2020
Infectious diseases	Survey	Moderate	2019
Cardiology	Survey	Weak	2020

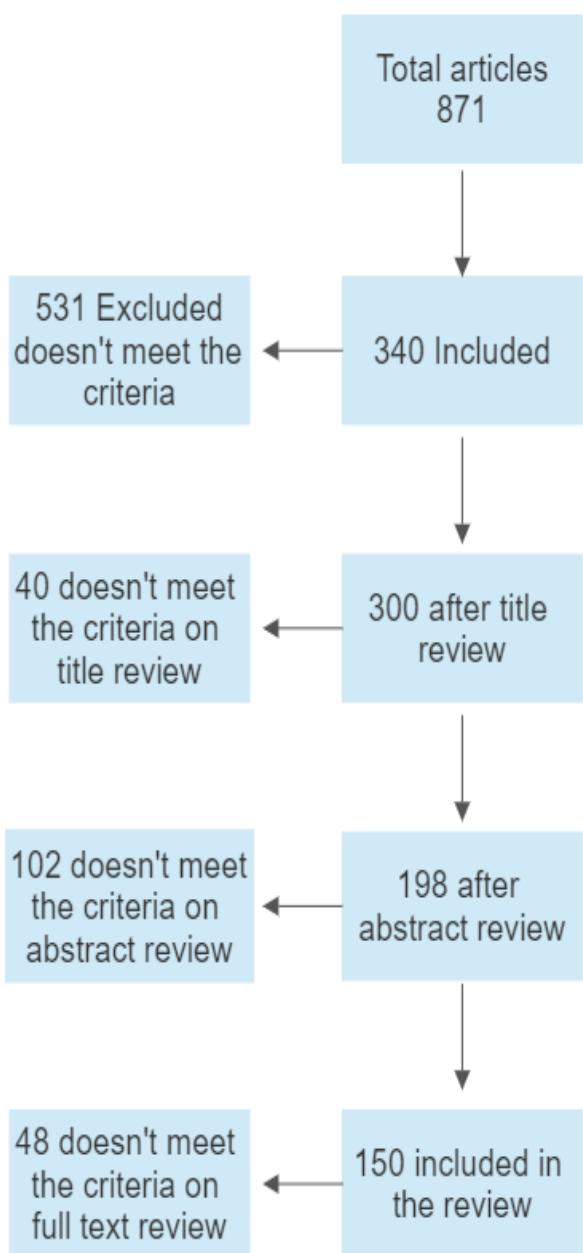


Fig 1: Flow chart of the studies included in the review

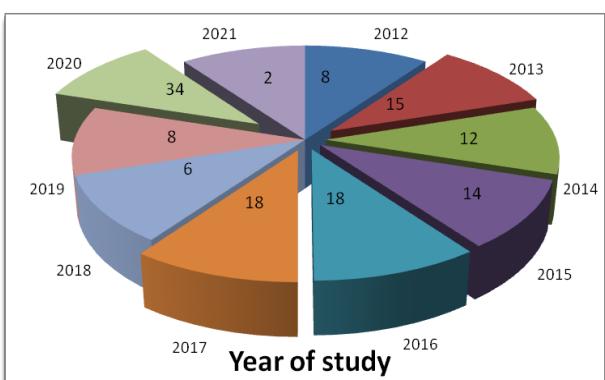


Fig 2: Year of study of publications

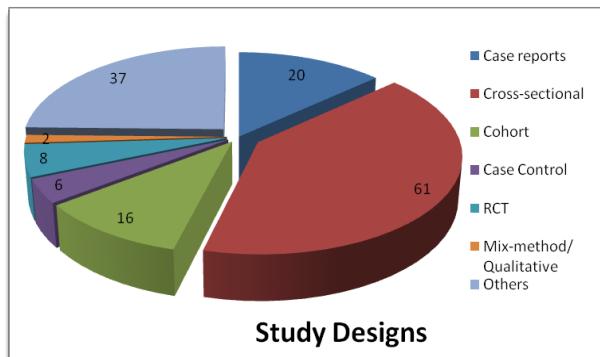


Fig 3: Study designs

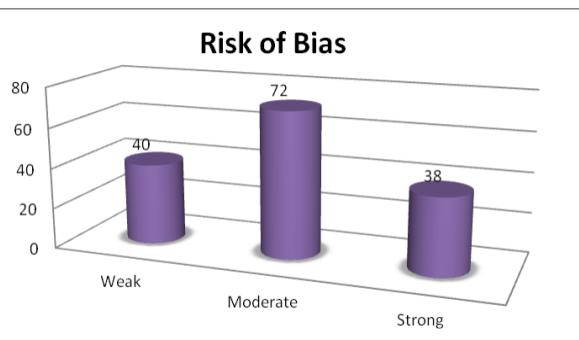


Fig 4: Risk of bias in the studies

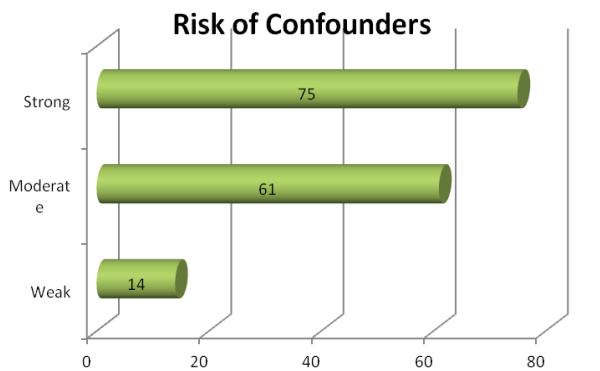


Fig 5: Risk of confounders in studies

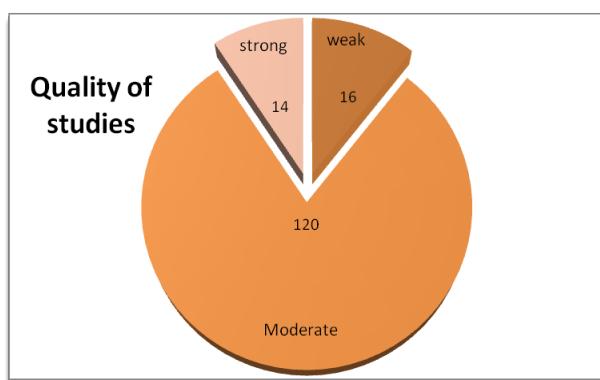
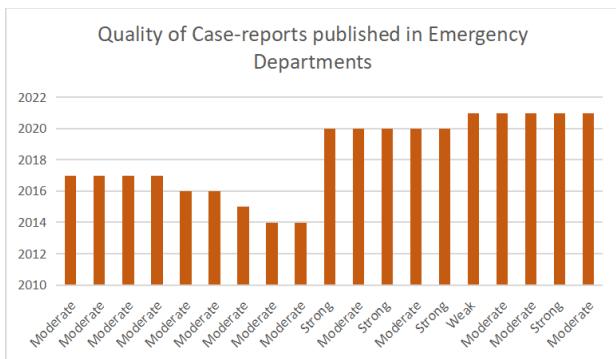
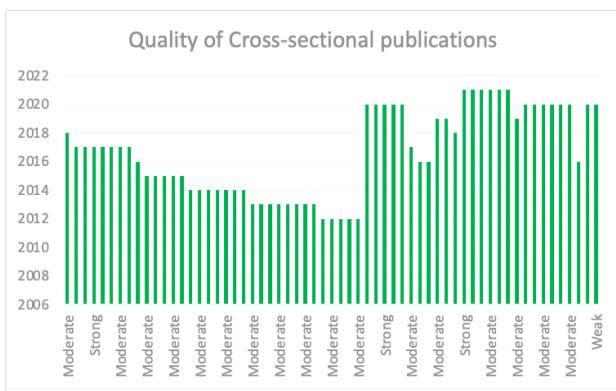
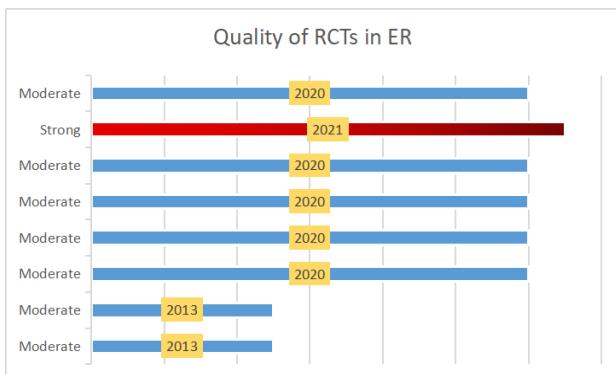


Fig 6: Overall Quality of Studies

**Fig 7: Quality of case reports published in ER****Fig 8: Quality of Cross-sectional studies published in ER****Fig 9: Quality of RCTs published**

can improve the quality of care and patient outcomes in emergency medicine.

Furthermore, our findings differ from the scoping review conducted by Kivlehan SM et al. in 2021⁴, which showed that emergency care in resource-limited settings (ECRLS) made up the largest part of published literature, followed by topics related to emergency medicine development and disaster response.

In contrast, the review highlights a lack of research on the financial aspects of emergency care in Pakistan.

Only a few studies have looked into the costs of emergency care and the effectiveness of related interventions. Future research should focus on examining the economic impact of emergency medicine in Pakistan, including treatment costs, the financial burden on patients, and strategies for better resource allocation.

A review of the social emergency medicine literature conducted by Shah et al.⁵ shows that out of 1,571 publications, 590 (38%) were relevant to the field of social emergency medicine. Most of these studies focused on human trafficking, followed by firearm violence and pediatric issues. In contrast, our analysis found only two studies addressing social aspects, with one specifically related to violence. Given the growing importance of these issues in modern society, there is an urgent need for more research on the social aspects of emergency medicine.

This study highlights the features and trends of research published in emergency departments across Pakistan over the past decade. The results emphasize the need for more high-quality research in this field and suggest that stronger evidence might be necessary for certain types of studies.

LIMITATIONS

The scoping review of emergency medicine studies in Pakistan has several limitations. First, focusing only on research from the past ten years may not fully cover the entire field. Also, the review's language bias, as it only includes studies published in English, might exclude important research published in other languages, affecting how well the results apply broadly. Additionally, the quality assessment used a broad scale that did not focus on specific quality aspects, which could lead to an incomplete review of the studies. Finally, the large scope of the review has resulted in limited information on certain research areas, making it difficult to draw clear conclusions about the current state of emergency medicine research in Pakistan.

Numerous potential research strategies can be proposed to overcome the limitations and improve the emergency medicine sector in Pakistan. First, it is essential to focus research efforts on marginalized populations, especially in rural areas. This will help identify specific challenges these communities face and guide targeted interventions. Furthermore, collaboration among healthcare organizations, policymakers, and researchers is vital for creating standardized protocols and guidelines for emergency medical practices. Additionally, there is a significant need for more research into the economic aspects of emergency care to better allocate resources and improve the overall efficiency of emergency medical services across the country. Finally, it is crucial to conduct more high-quality studies with an emphasis on reducing biases and confounding factors.

CONCLUSION

In summary, the scoping review of the literature on emergency medicine in Pakistan has shed light on the current landscape of the field and highlighted avenues for future advancement. By collaborating with policymakers and healthcare practitioners to address existing challenges and explore proposed research areas, it is possible to enhance Pakistan's emergency medical care system and improve patient outcomes.

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Authors Contribution:

Following authors have made substantial contributions to the manuscript as under

Authors	Conceived & designed the analysis	Collected the data	Contributed data or analysis tools	Performed the analysis	Wrote the paper	Other contribution
Jawed R	✓	✗	✓	✗	✓	✗
Aftab U	✓	✓	✗	✓	✓	✗
Soomar SM	✗	✓	✗	✗	✓	✗
Waheed S	✓	✓	✓	✗	✓	✓

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.



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