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Review

Scoping Review of Triage Modifications to Emergency Medical Care in Hospitals Post-COVID-19

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Abstract: Post-COVID-19, significant triage modifications were made in emergency hospital medical care. Previous scoping reviews investigated triage changes during COVID-19. This scoping review uniquely considers post-pandemic effects. It searches the parameters "COVID-19, triage, hospital, emergency medical care" in four primary databases, one register, and a supplementary database to determine the range of emergency hospital triage changes. Following PRISMA guidelines, studies included are post-2023 publications, those in English, and research studies. Excluded were duplicates, reviews, books, and reports lacking research studies or including irrelevant information on COVID-19, triage, hospital, or emergency medical care. Identified are 1071 records: OVID (n = 20), PubMed (n = 2), Scopus (n = 46), Web of Science (n = 20), Cochrane COVID-19 Register (n = 18), and Google Scholar (n = 965). Six studies are included from the Web of Science (n = 1) and Google Scholar (n = 5). One study includes reports from six different countries; thus, there are 11 reports. The modification of triage was concerning four ways, with each country focusing on a specific triage change. Adaptive changes were proactive rather than reactive. Triage-related future research suggestions include the four triage aspects, international comparisons, and longitudinal change. The recommendation is for research assessing Google Scholar.

Keywords: COVID-19; triage; hospital; emergency medical care; PRISMA

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1. Introduction

Shortly before the first recognized case of severe acute respiratory syndrome coronavirus 2 [1]—the SARS-CoV-2 virus that resulted in the COVID-19 pandemic [2] over a series of waves and variants [3]—an assessment showed that intensive care clinicians were often uncertain regarding the meaning of triage in disaster situations [4]. Defined as a combination of three components related to the order in which patients are processed, including sorting, prioritizing, and allocating resources, triage during disasters just before the COVID-19 pandemic was recognized to be based on patient survival, quality of life, and resource consumption [4]. The World Health Organization declared COVID-19 a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on 11 March 2020 [5]. With the arrival of COVID-19, there was a refinement to the understanding of the three aspects of triage to survival regarding the virus, post-pandemic quality of life, and consumption of medical resources required to achieve the set pandemic goals—decisions that were considered best practice based on a set protocol [6]. The World Health Organization ended the COVID-19 pandemic with a statement on 4 May 2023 [7]. With the ending of the pandemic, the question is, what are the triage changes in hospitals regarding emergency medical care post-COVID-19?

The aim is to answer this question through a scoping review. Several scoping reviews, including [8–11], have been conducted regarding emergency hospital triage changes during the pandemic. There has yet to be a scoping review of triage changes post-COVID-19. The concept [12] of this scoping review regards changes to triage in emergency medical care for the post-pandemic period only. Thus, the database search parameters are limited to the four keywords "COVID-19, triage, hospital, emergency medical care" for English language studies conducted after 4 May 2023. Only such studies are relevant to this investigation of hospital-based emergency medical care triage during the post-pandemic period—defining the scoping review.

The principal conclusion is that the changes adopted to hospital-based triage during post-COVID-19 for the three components of triage regard four different aspects of triage, the focus of which is country-dependent. Those countries that made these changes proactively rather than reactively reported more successful outcomes for healthcare delivery.

2. Materials and Methods

A scoping review was selected in contrast to a systematic review as the method for this search because the intent was to find the range and depth of research that has been conducted on this subject since the end of the pandemic rather than to examine the PICO (population, intervention, comparison, and outcome) of the studies [13]. The scoping review undertaken searched four primary databases (OVID, PubMed, Scopus, and Web of Science), one register (the Cochrane COVID-19 Register), and one supplementary database (Google Scholar) selected for their relevance and reach [14]. The initial keywords searched were "COVID-19, triage, hospital, emergency medical care" for each database, with additional keywords added relevant to the specific database. Following PRISMA guidelines [15–17], those included were post-2023 publications, those in English, and research studies. Excluded were reviews, books, and reports of irrelevant information (including those that included the keywords in the references alone). As this is a COVID-19-related study, consideration is of PROSPERO requirements; however, as a scoping review, the study is not to be registered with PROSPERO [18].

The searches undertaken independently by the author on 7 November 2024 were of all databases, excluding Google Scholar. Among those databases included in the OVID search were "Embase Classic + Embase 1947 to 6 November 2024", "Ovid Healthstar 1966 to September 2024", "Journals@Ovid Full Text 5 November 2024", and "Ovid MEDLINE(R) ALL 1946 to 6 November 2024". The additional limits for OVID to ensure the most relevant returns were "English Language" and "2023–present". For PubMed, the additional limit was "2023–2024". Scopus required this limit plus others—"Medicine", "Article", "English", and "Humans". "English" was also an extra limit for the Web of Science. Furthermore, adding "Emergency medicine" was necessary to produce relevant results. Finally, for the Cochrane COVID-19 Study Register, the additional limits were "Created: 4 May 2023–7 November 2024", "Journal Article", and "Reports Results". For this register, "COVID-19" was removed from the keywords searched to reduce the extraneous returns. The Google Scholar search was the only one on 10 November 2024. The other limits were "No citations", and "Since 2023". To improve search accuracy, additionally, a modification of the parameter included "Post-COVID-19, triage changes, hospital, emergency medical care, 2023, 2024".

Following the PRISMA requirements for the search, the reports excluded from those assessed for eligibility included those returns that, although containing each of the keywords of the parameter, mentioned any of the keywords only in the reference list and were thus irrelevant. Also, part of what was considered irrelevant were those articles that, although published in either 2023 or 2024, reported on studies conducted during COVID-19 rather than following the pandemic. Inclusion of the Preferred Reporting Items for Systematic

Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist is in Supplementary S1. The protocol registration on 9 December 2024 is at https://osf.io/uzvdx. Figure 1 documents the PRISMA charting process.

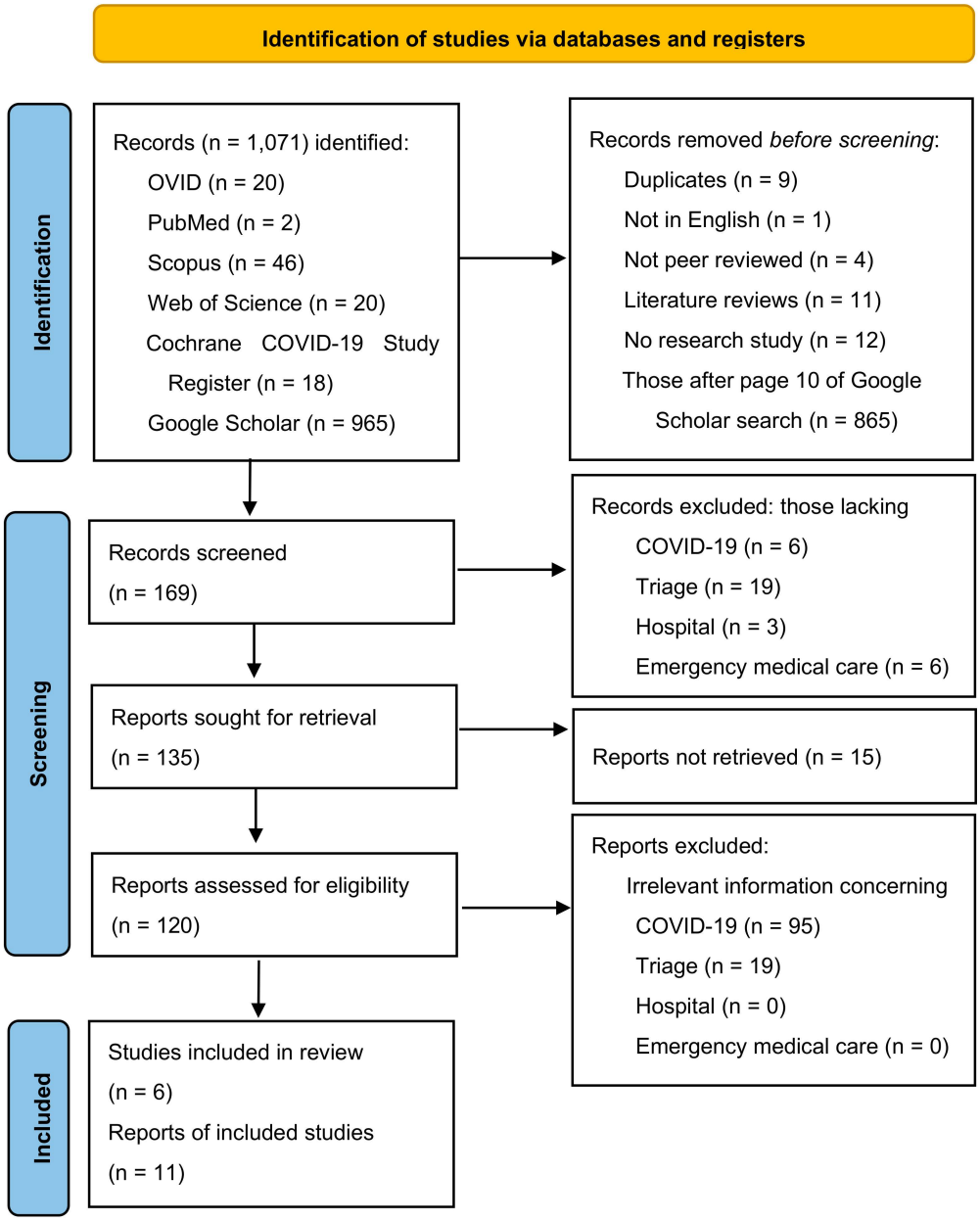

Figure 1. The Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) flow of information chart (Page et al. 2020 [19]) for a 7 November Search of OVID, PubMed, Scopus, Web Of Science, and Cochrane COVID-19 Study Register, and a 10 November 2024 Search of Google Scholar. The parameters searched were "COVID-19, Triage, Hospital, Emergency Medical Care", with additional limitations and modifications made dependent on the database to ensure the relevance of the returns.

3. Results

The results regard the searches for the databases and register performed on 7 November 2024, plus the additional database search on 10 November 2024. These results are comprehensively recorded in Supplementary S2 with the exclusions color-coded and a legend to the color-coding provided at the end of this nine-page document. After the following investigation of the search results, the included studies are examined.

3.1. Searches Performed

Of the four databases and one register searched on 7 November 2024, the first search was for OVID. The keywords were "COVID-19, triage, hospital, emergency medical care" with the additional limits of "English Language, 2023-present". Twenty records were returned. The exclusions, following the PRISMA process, are duplicates (n = 0), not in English (n = 0), not peer-reviewed (n = 3), literature review (n = 1), not a research study (n = 3), no mention of COVID-19 (n = 3), no mention of triage (n = 0), no mention of hospital (n = 0), no mention of emergency medical care (n = 0), not retrieved (n = 1), irrelevant information on COVID-19 (n = 9), irrelevant information on triage (n = 0), irrelevant information on hospital (n = 0), irrelevant information on emergency medical care (n = 0). The result of the exclusions left no included studies from the OVID search.

The keywords of the PubMed search were "COVID-19, triage, hospital, emergency medical care", with the additional limit of "2023–2024". Two records were returned. The exclusions, following the PRISMA process, are duplicates (n = 0), not in English (n = 0), not peer-reviewed (n = 0), literature review (n = 2), not a research study (n = 0), no mention of COVID-19 (n = 0), no mention of triage (n = 0), no mention of hospital (n = 0), no mention of emergency medical care (n = 0), not retrieved (n = 0), irrelevant information on COVID-19 (n = 0), irrelevant information on triage (n = 0), irrelevant information on hospital (n = 0), and irrelevant information on emergency medical care (n = 0). The result of the exclusions left no included studies from the PubMed search.

The Scopus keywords were "COVID-19, triage, Hospital, Emergency medical care" with the additional limits of "2023–2024, Medicine, Article, English, Humans". Forty-six records were returned. The exclusions, following the PRISMA process, are duplicates (n = 1, duplicated and counted with Google Scholar), not in English (n = 1), not peer-reviewed (n = 0), literature review (n = 0), not a research study (n = 2), no mention of COVID-19 (n = 1), no mention of triage (n = 0), no mention of hospital (n = 0), no mention of emergency medical care (n = 1), not retrieved (n = 4), irrelevant information on COVID-19 (n = 36), irrelevant information on triage (n = 0), irrelevant information on hospital (n = 0), and irrelevant information on emergency medical care (n = 0). The result of the exclusions left no included studies from the Scopus search.

Web of Science had the keywords "COVID-19, triage, Hospital, Emergency medical care", with the additional limits of "Article, English, Emergency medicine". Twenty records were returned. The exclusions, following the PRISMA process, are duplicates (n = 0), not in English (n = 0), not peer-reviewed (n = 0), literature review (n = 1), not a research study (n = 0), no mention of COVID-19 (n = 2), no mention of triage (n = 0), no mention of hospital (n = 0), no mention of emergency medical care (n = 0), not retrieved (n = 2), irrelevant information on COVID-19 (n = 14), irrelevant information on triage (n = 0), irrelevant information on hospital (n = 0), and irrelevant information on emergency medical care (n = 0). The exclusions left one included study from the Web of Science search.

For the Cochrane COVID-19 Study Register search, the keywords were modified to "triage, Hospital, Emergency medical care" because when "COVID-19" was included among the keywords, there were over 32,000 returns. The additional limits were "created: 4 May 2023–7 November 2024, Journal Article, Report Results". Eighteen records were returned. The exclusions, following the PRISMA process, are duplicates (n = 8, all duplicated and counted with Scopus), not in English (n = 0), not peer-reviewed (n = 0), literature review (n = 0), not a research study (n = 0), no mention of COVID-19 (n = 0), no mention of triage (n = 1), no mention of hospital (n = 0), no mention of emergency medical care (n = 0), not retrieved (n = 3), irrelevant information on COVID-19 (n = 6), irrelevant information on triage (n = 0), irrelevant information on hospital (n = 0), and irrelevant information on

emergency medical care (n = 0). The result of the exclusions left no included studies from the Cochrane COVID-19 Study Register search.

The Google Scholar search of 10 November 2024 produced an extensive number of returns at 16,800 when the keywords searched were "COVID-19, triage, Hospital, Emergency medical care", with the additional limits of "no citations, since 2023". To improve the relevance of the returned results, the parameters were modified to "Post-COVID-19, triage changes, hospital, emergency medical care, 2023, 2024, no citations, since 2023", producing 965 returns. The decision was made to examine the first 100 results alone. Of those 100, the exclusions, following the PRISMA process, are duplicates (n = 0), not in English (n = 0), not peer-reviewed (n = 1), literature review (n = 7), not a research study (n = 7), no mention of COVID-19 (n = 0), no mention of triage (n = 18), no mention of hospital (n = 3), no mention of emergency medical care (n = 5), not retrieved (n = 5), irrelevant information on COVID-19 (n = 30), irrelevant information on triage (n = 19), irrelevant information on hospital (n = 0), irrelevant information on emergency medical care (n = 0). The result of the exclusions left five included studies from the Google Scholar search.

Given the PRISMA method of reporting, what is not evident from Figure 1 is that before screening occurred, but after the decision was made to screen only the first 100 returns of the Google Scholar search, there were 206 studies in total. Of these, there were nine duplicates. All were duplicated with Scopus—one with Google Scholar and the other eight with the Cochrane COVID-19 Study Register. The one duplicate with Google Scholar is recorded with that search, while the other eight are recorded with Scopus. None of these duplicates were included. As noted in Figure 1, significantly, 94 of the returns mentioned unrelated information regarding COVID-19. Either the virus is stated merely as occurring, the study data were before the end of COVID-19, or the mention of it is found only in the reference list. Irrelevant information for the same reasons was also found in 19 articles regarding triage. It is noteworthy that none of the returned articles have irrelevant information concerning hospitals or emergency medical care. Although Google Scholar has been categorized as a supplementary database because its returns are inconsistent [14], this database returned the most relevant results, returning these results at the top of the results. For the other search engines, there were no relevant returns. The Web of Science returned one included study (18th of 20). Although 100 records were screened in the Google Scholar search, the last record to be included was the 51st (see Supplementary S2). As such, the final five pages of returns were unnecessary to screen. From these results, the conclusion is that although Google Scholar provides inconsistent returns, it is the most productive search engine for this search.

3.2. Included Studies

Six publications mention COVID-19, triage, hospital, and emergency medical care as integral to the study (see Table 1). Web of Science returned the first study, and the next five were from Google Scholar. The search was of 2023 and 2024 peer-reviewed publications, yet the publication of only one article concerning this topic was in 2023, and the remainder were from 2024. This result suggests that additional studies on this topic might be forthcoming. This conclusion is particularly so because a significant portion of the articles excluded were those published in 2023 or 2024, but studies conducted between 2020 and 2022 were grouped as irrelevant information.

Table 1. Citation Number, title of study, study authors, database returning the study, and date of the publication for included studies from a 7 November search of the first study and a 10 November search of the remaining six.

Cit #	Title	Authors	Database	Date
[20]	Quality improvement in the era of boarding and burnout: A postpandemic blueprint	Schwartz, H.; Huen, W.; Kanzaria, H.K.; Peabody, C.R.	Web of Science	2024
[21]	Post-Pandemic Growth in 9-1-1 Paramedic Calls and Emergency Department Transports Surpasses Pre-Pandemic Rates in the COVID-19 Era: Implications for Paramedic Resource Planning	Strum, R.P.; McLeod, B.; Mondoux, S.; Miller, P.; Costa A.P.	Google Scholar	2024
[22]	Lessons of the COVID-19 Pandemic for Ambulance Service in Kazakhstan	Messova, A.; Pivina, L.; Ygiyeva, D.; Batenova, G.; Dyussupov, A.; Jamedinova, U.; Syzdykbayev, M.; Adilgozhina, S.; Bayanbaev, A.	Google Scholar	2024
[23]	Post-COVID health policy responses to healthcare workforce capacities: A comparative analysis of health system resilience in six European countries	Burau, V., Mejsner, S.B., Falkenbach, M., Fehsenfeld, M., Kotherová, Z., Neri, S., Wallenburg, I., & Kuhlmann, E.	Google Scholar	2024
[24]	American Society of Echocardiography COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics	Kirkpatrick, J.N., Swaminathan, M., Adedipe, A., Garcia-Sayan, E., Hung, J., Kelly, N., Kort, S., Nagueh, S., Poh, K. K., Sarwal, A., Strachan, G. M., Topilsky, Y., West, C., & Wiener, D. H.	Google Scholar	2023
[25]	Patient experience of non-conveyance in the EMS of Southwest Finland: a descriptive survey study	Skaffari, E., Iirola, T. & Nordquist, H.	Google Scholar	2024

It is valuable that the data included in these studies are from various countries. These countries include the USA (two studies), Canada, Kazakhstan, Austria, the Czech Republic, Denmark, Germany, Italy, Netherlands, and Finland. As such, several perspectives unique to countries can consider the information provided regarding the modified practices in emergency hospital triage post-pandemic.

Table 2 provides the relevant details regarding hospital triage modifications for emergency medical care post-COVID-19 for each included study. Notable from this table is that triage in this regard involves several aspects. These include a rethinking of the triage systems and structures at the administrative level [20], reducing the use of emergency services by patients through increased and improved telephone/online assistance [23], a focus on transporting the patient to the hospital more efficiently [21,22,25], and particular efforts to streamline the triage process once at the hospital [24]. Two reports mention, to a significant extent, that the changes made post-COVID-19 resulted from the increased use of emergency services by patients with chronic diseases after the pandemic was over [21,22].

Table 2. Citation number, title of study, and how emergency care hospital triage was modified post-COVID-19 in each study.

Cit #	Title	How Emergency Care Hospital Triage Was Modified Post-COVID-19
[20]	Quality improvement in the era of boarding and burnout: A postpandemic blueprint	Developed robust value stream map leveraging electronic health record throughput data to visualize the triage process at a detailed level. This outcome resulted in a "left without being seen" rate dropping from 7.4% to 5.4%, with 50% of staff "strongly agreed" and 42% "agreed" there was an improvement in triage resulting from this reconceptualization of triage.
[21]	Post-Pandemic Growth in 9-1-1 Paramedic Calls and Emergency Department Transports Surpasses Pre-Pandemic Rates in the COVID-19 Era: Implications for Paramedic Resource Planning	Post-pandemic, 911-initiated paramedic calls experienced a substantial increase, surpassing pre-pandemic rates. Emergency department (ED) transports returned to a steeper and continuous growth pattern compared with pre-pandemic levels, resulting in an urgent need to develop new care models addressing paramedic responses to 911 calls and transport to overcrowded EDs.
[22]	Lessons of the COVID-19 Pandemic for Ambulance Service in Kazakhstan	There was a significant increase in ambulance calls in which there is no current or potential threat to the patient's life and health post-pandemic in 2022 and 2023 of 4.7 and 4.5 times, respectively, compared with 2019. People with chronic comorbid diseases who did not come to the emergency department during the pandemic began to seek medical help.
[23]	Post-COVID health policy responses to healthcare workforce capacities: A comparative analysis of health system resilience in six European countries	In Austria, the Czech Republic, Denmark, Germany, and Italy, telephone/video services reduced emergency visits. The Netherlands focused on reducing emergency demand through organizational and systems change with triage patient questionnaires and discouraging patient access during the holidays, especially by referring potential admissions to online ('self-help') information.
[24]	American Society of Echocardiography COVID-19 Statement Update: Lessons Learned and Preparation for Future Pandemics	Maintenance of the cardiac point-of-care ultrasound (POCUS) triage protocols developed during COVID-19, assessing the need for ancillary testing. Chest POCUS exams act as first-line imaging to guide the need for further imaging and limit exposure. Technology and protocols in place to allow remote image interpretation and instruction.
[25]	Patient experience of non-conveyance in the EMS of Southwest Finland: a descriptive survey study	In Finland, the general standard for paramedics is to reach low-urgency patients triaged by the Emergency Response Centre within two hours. Patients triaged as more urgently in need of care receive help faster.

Table 3 offers a categorization by country and triage modification for each of the eleven individual reports of the six studies. A checkmark indicates that the triage modification was the focus of the article. It does not imply that this modification was necessarily the only one employed in the hospital—merely the one examined in the article. Notably, most European countries concentrated on creating online or other pre-hospital triage methods that kept some patients from believing they needed hospital emergency services [23]. This solution is in contrast to the USA where, even if increased online services were relevant, the focus was a rethinking of all systems and structures related to triage [20] and streamlining the process once patients were at the hospital [24]—a method that also differentiated the Netherlands from the other European countries studied [23]. These proactive methods were not utilized in Canada [21], where there was a reactive meeting of the escalating emergency room visits as the numbers increased [26,27], causing additional burdens on triaged healthcare delivery [28]. This type of response is in contrast to that of Kazakhstan and Finland, where hospital transportation changes were found to decrease the triage burden [22,25].

Table 3. Citation number and the four means by which triage was modified in the reports of eleven countries in the six included studies, where "✓" indicates the means was the focus of the report.

Cit #	Country	Rethinking of Systems and Structures	Reduce Use Through Online Services	Changes to Transportation to Hospital	Streamlined Processes at Hospital
[20]	USA	✓			
[21]	Canada			✓	
[22]	Kazakhstan			✓	
[23]	Austria		✓		
[23]	Czech Republic		✓		
[23]	Denmark		✓		
[23]	Italy		✓		
[23]	Germany		✓		
[23]	Netherlands				✓
[24]	USA				✓
[25]	Finland			✓	

The Introduction noted the definition of triage as sorting, prioritizing, and allocating resources [4]. In this regard, it is relevant to consider the results presented in Table 3 in Table 4 from the perspective of which of the three components that define triage were highlighted in the eleven reports.

Table 4. Citation number and the four means by which triage was modified in the reports of eleven countries in the six included studies specifying the component of triage for each.

Cit #	Country	Rethinking of Systems and Structures	Reduce Use Through Online Services	Changes to Transportation to Hospital	Streamlined Processes at Hospital
[20]	USA	sorting, prioritizing, and allocating resources			
[21]	Canada			allocating resources	
[22]	Kazakhstan			prioritizing	

Table 4. *Cont.*

Cit #	Country	Rethinking of Systems and Structures	Reduce Use Through Online Services	Changes to Transportation to Hospital	Streamlined Processes at Hospital
[23]	Austria		prioritizing		
[23]	Czech Republic		prioritizing		
[23]	Denmark		prioritizing		
[23]	Italy		prioritizing		
[23]	Germany		prioritizing		
[23]	Netherlands				sorting, prioritizing, and allocating resources
[24]	USA				allocating resources
[25]	Finland			sorting, prioritizing	

In reconceptualizing triage, refs. [23] (regarding the Netherlands report of the study) were the only reports that considered all components of triage in their response to post-pandemic conditions. Although [22,25] each concentrated on changes to transportation to the hospital concerning their modifications to triage post-pandemic, they differed regarding the triage components. In [21], allocating resources to an overburdened system was considered. In contrast, ref. [22] noted that as chronic patients started to use transportation services non-urgently comparatively more than during the pandemic, this affected their triage priority. For [25], the focus was sorting and prioritizing the non-urgent use of paramedic services. For the European countries except the Netherlands [23], the focus was encouraging patients to sort themselves using telephone or video services. Report [24] indicates one method of allocating resources that streamlined triage.

4. Discussion

Several points are evident in determining what the changes to triage were in hospitals regarding emergency medical care post-COVID-19. The first is that search engines of primary databases recommended for scoping reviews [14,29] were generally ineffective in finding relevant articles. This ineffectiveness extends to the Cochrane COVID-19 Study Register, which might be presumed to have been most appropriate. Google Scholar continues to be recognized as a supplementary database for grey literature [30]; however, recent research indicates that it far outperforms other databases regarding the extent of its searches [31]. For the search of the keywords "COVID-19, triage, hospital, emergency medical care", without the search of Google Scholar, ten of the eleven reports on this topic would have been overlooked.

The next recognizable point is that post-COVID-19, hospital triage is not exclusive to the measures taken by hospitals once patients are physically present in the emergency department. It includes assessments of how to make the entire system and structures of triage work effectively [20]—methods that can extend to global considerations [32], keeping patients from coming to the hospital from the use of telephone/online services [23]. One meaning of self-triage referred to in a recent study [33] includes improvements to transportation by ambulance to the hospital [21,22,25] through web-based applications [34] and other means, which is particularly notable in reducing time in serving stroke patients [35] and various methods of streamlining the process of triage once the patient is at the hospital [23,24]. Here, self-triage entails checking oneself into the hospital once at

the emergency department through the use of kiosks [36] or having easily transportable diagnostic equipment that is moveable where and when it is needed [34].

Thirdly, changes to triage post-COVID-19 differed by country. Those countries that were proactive in improving triage in anticipation of the influx of chronic patients to the emergency departments after the end of pandemic limitations were more satisfied with their efforts [20,22–25]. In contrast, when a country was reactive to the increase, the healthcare system suffered [21], at least partially resulting from resistance by chronic disease patients to online self-help methods [37]. The finding that countries should be proactive rather than reactive to triage modifications is relevant in considering improvements to triage when future pandemics occur.

4.1. Limitations

Although the PRISMA extension for scoping reviews provides a recommended framework for methodological issues [38], the charting process structure and synthesis limits the information recorded [39]. Therefore, by following the PRISMA guidelines for this scoping review, the information provided on the chart is insufficient. For this reason, the text offers additional details on the exclusion process.

In selecting to conduct a scoping review, a systematic review with a meta-analysis was not chosen [13]. Compared with systematic reviews in healthcare, which began in the 1970s, scoping reviews are relatively new [40]. Like a systematic review, they follow a structured process. However, scoping reviews map breadth within particular contexts to answer what evidence exists [12]. A limitation of this review is not undertaking the critical appraisal of the methodological quality of the included studies, data extraction, analysis, and considerations towards evidence applicability associated with a systematic review, and statistically estimating the data effect extracted from the individual studies through a meta-analysis [41].

Cognitive bias is possible with independent research by one researcher [42]. Measures are necessary to overcome this possibility [43]. The author has included the record provided by the database of studies returned for each search conducted to mitigate cognitive bias. These records are in Supplementary S2. Creating a detailed color-coded system identifies and differentiates articles following the PRISMA process. By making the decisions regarding each of the 206 studies considered for inclusion available for inspection and by including the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist as Supplementary S1, the author actively intends to alleviate cognitive bias.

4.2. Future Research Directions

As is evident from this study, there is currently little research on how emergency hospital triage has changed post-COVID-19. Proactive changes can improve the healthcare system, while reactive ones are detrimental [44]. As a result, research in this area is imperative to encourage proactive measures. The research areas available for consideration are various. One area is investigating the four triage modification areas. (1) System and structural changes, (2) self-triage to keep patients from believing they need emergency department admittance, (3) improved speed and efficiency of the ambulance service, and (4) changes to the efficiency of triage practices at the hospital. Studies focused on all four aspects simultaneously would be novel and valuable. Other suggested research directions pertain to an international comparison of changes that have taken place regarding triage. The comparison of six European countries has started this process; however, there is no research on changes in Great Britain, several other European countries, Southeast and East Asian countries, Australasia, Latin America, or Africa. In all, comparative work to

undertake remains, including revisiting the sites included in this study for assessment to conduct longitudinal research. Such comparative work is also significant as triage in emergency medical care would vary by country and healthcare system [45]. Overall, the research aim is to improve the proactive triage responses to post-COVID-19 hospital emergency medical care.

Regarding searches more generally, additional research regarding Google Scholar as a database search engine concerning its applicability as a primary database for medically related matters is also necessary and suggested.

Gusenbauer and Haddaway [14] have conducted the most extensive and well-cited analysis of databases to date. "Particularly, our findings demonstrate why Google Scholar is inappropriate as a principal search system" is the statement in the Abstract that presents why Google Scholar has become questioned as a primary database for searches published in academic journals. Examining their publication closely, the concerns regarding Google Scholar appear insufficient to judge the database as inappropriate for primary searches.

The following represent the extent of their phrases critical of the database: "search systems such as Google Scholar which have built up an aura of secrecy around the size of their databases", "Crawler-based web search engines (e.g., Google Scholar), for example, function differently from bibliographic databases which have a curated catalogue of information (e.g., Scopus)", "while Google Scholar is considered unsuitable for primary review searches, it is considered a suitable supplementary source of evidence (including on grey literature)", "failed all or all but one of the Boolean tests we performed", "only allows searches of up to 256 characters", "While WorldWideScience failed to deliver replicable results at all times, Google Scholar failed to deliver them only during certain periods: sometimes, search results were replicable with two consecutive queries; then with a third query or with queries after some queries in between, they were no longer replicable and the results set differed in a way not explainable by natural database growth", "The criticism of user-friendliness at any cost is especially directed at Google Scholar, which is more concerned with "tuning" its first results page than with overall precision", and "Google Scholar's extraordinary coverage acting as a multidisciplinary compendium of scientific world knowledge should not blind users to the fact that users' ability to access this compendium is severely limited, especially in terms of a systematic search".

Beyond these critical remarks concerning Google Scholar, the authors also state: "Comparisons of citation indexes generally rate Google Scholar as the most comprehensive", and "Google Scholar highly precise for exploratory searches conducted by a user interested in only a few relevant results on the first search engine results page", and, perhaps most importantly, "Google Scholar emerged as the number one go-to academic search engine for most academic users".

That the programming of the database is secretive, performing Boolean tests is not possible, searches can have only 256 characters, and it is crawler-based, consistently updating its results, seems like insufficient reasons for informing academics there is a problem in turning to Google Scholar as a primary database. These authors claim, "our findings demonstrate why Google Scholar is inappropriate as a principal search system". Their comments distinguish the differences between Google Scholar and other databases but have not demonstrated why they make it inappropriate as a primary database—especially when its returns are the most comprehensive and relied on by most academics. Consequently, additional research is necessary if Google Scholar is judged inappropriate as a primary database.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/ecm2010006/s1, Supplementary S1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR) Checklist, and Supplementary S2. Search results and outcomes for this study of the four primary databases, a register, and a supplementary database.

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