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Case Reporting Appraisal of Notifiable Infectious Disease: A Systematic Review

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Systematic Review Article

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ABSTRACT

Background: The World Health Organization (WHO) considers as public health crisis that should be of concern on a worldwide scale. Public health officials are required to be reported by medical professionals, laboratories, or other institutions. There is a wide range of variation in the proportion of notifiable respiratory disorders that are reported between regions, countries, and diseases.
Purpose: The aim of this study is to discover notifiable infectious diseases in Asia and other low-income countries from 2019 to the present, utilizing an adult population. The objectives of this study

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are therefore to summarize scientific evidence and provide recommendations on the completeness of notifiable infectious diseases, particularly COVID-19.
Methods: The study followed the process of Whittemore and Knafl [1] that include the following criteria; defining the issue, developing the research question, carrying out a focused literature search, and employing mixed-methods or qualitative data processing methods to reduce the possibility of bias and error.
Results: From the twenty (20) studies included in this review, there were a total of 10941 samples, 36 cities included, 26 data points, 9 databases, 5 municipalities, and thousands of cases, with 941 discussing leptospirosis diseases, 60 documents discussing COVID, 10,000 samples discussing rabies, and 1906 samples for dengue infection
Conclusion: A review that was both systematic and integrative offered information on risk factors and discussed the comprehensiveness of reportable infectious diseases. Age, race, ethnicity, language, income, and living conditions are risk factors that further increase the likelihood of these notifiable infectious diseases occurring.

Keywords: Air pollution; infectious disease; notifiable infectious.

1. INTRODUCTION

Globally, infections of the lower respiratory tract are a common problem. Both short- and long-term exposure to air pollution can have detrimental effects on cardiorespiratory health. It is thought that the long-distance movement of air contaminants from modernized parts of mainland China, in addition to local sources of air pollution such as automobiles, industry, and open-fire burning, are contributing factors to the deterioration of air quality in northeast Asia, including Korea and Japan [2]. As an example, community-acquired pneumonia (CAP) is one of the most prevalent infectious diseases and accounts for an important amount of mortality as well as morbidity. A hypoxic atmosphere, low barometric pressure, a great deal of ultraviolet radiation, and low amounts of humidity can be found at high elevations. Hypoxia can disrupt the immune system's natural equilibrium, specifically the activation of T cells; therefore, the immune system may become more susceptible to bacterial infection. CAP's respiratory symptoms resemble those of extreme-altitude pulmonary edema when it occurs at high altitudes. On the other hand, the presence of CAP can make high-altitude pulmonary edema significantly worse. It has been observed all around the world that there is very little published data on CAP in individuals who live at high elevations [3]. Problems with one's respiratory system that persist over time can be incapacitating and have a destructive effect on one's quality of life. COPD is expected to affect 53 million individuals in India by the year 2020, making it the second leading cause of mortality as well as the next leading cause of life years adjusted for disability. Hypoxia has the potential to disturb the body's immune system's normal balance, specifically the function of T cells, making the body more susceptible to bacterial infection. The symptoms of lung congestion associated with CAP are identical to those of high-altitude pulmonary edema when experienced at high altitudes. On the other hand, having chronic airway obstruction (CAP) can make high-altitude pulmonary edema significantly worse. There have been very few studies published on CAP in individuals who live at high elevations around the world [3]. Chronic breathing problems can make it impossible for a person to do daily tasks and lower their overall quality of life. According to Ghorpade's research from 2020, COPD is projected to affect 53 million individuals in India, making it the country's second-greatest cause of death and disability-adjusted life years.

In many Asian countries, lower respiratory diseases pose a significant challenge to the nation's public health. The prevalence of lower respiratory diseases may be influenced by environmental conditions, population density, and accessibility to medical care. In Asia, the frequency of lower respiratory illnesses varies greatly across countries and regions. On the other hand, lower respiratory diseases constitute a major health problem in many parts of Asia, and the disease burden in Asia is often bigger than in other regions. This is because Asia has a larger population than other countries. According to the World Health Organization (WHO), lower respiratory diseases are the leading cause of morbidity and mortality in the vast majority of Asia's Western Pacific region. In 2016, lower respiratory infections killed more than 700,000 individuals in the Western Pacific region. The countries of China, Vietnam, Indonesia, and the

Philippines were the ones that were most negatively affected by this. The Global Burden of Disease Study identifies the high prevalence of lower respiratory infections in Asia as another significant health issue in the region. Lower respiratory infections were the second main cause of premature mortality in South Asia and the third most common cause of premature death in Southeast Asia in 2019. In addition, air pollution, exposure to smoke from indoor cooking and heating, and the use of tobacco products significantly increase the prevalence of lower respiratory disorders in numerous regions of Asia. The incidence of diseases of the lower respiratory tract varies by country, region, and population. In contrast, lower respiratory diseases continue to be a significant public health burden in many regions of Asia, necessitating ongoing prevention and treatment efforts.

Lower respiratory infections were the second largest cause of death from an early cause in South Asia in 2019 and the third major cause of death from an early cause in Southeast Asia. Additionally, factors such as air pollution, exposure to indoor cooking and heating smoke, and the use of tobacco all contribute significantly to the burden of lower respiratory diseases in many parts of Asia. The frequency of disorders affecting the lower respiratory tract varies widely across nations, regions, and populations. On the other hand, disorders of the lower respiratory tract continue to be a significant problem for public health in many parts of Asia, necessitating continual attention and resources for the purpose of treatment and prevention. Lower respiratory infections were the next main cause of premature death in South Asia and the third most common cause of premature death in Southeast Asia in 2019. Additionally, factors such as air pollution, exposure to indoor cooking and heating smoke, as well as the use of tobacco, all contribute significantly to the burden of lower respiratory diseases in many parts of Asia. Infections of the lower respiratory tract might differ from country to country and population to population. In contrast, lower respiratory diseases continue to be a significant public health concern in several Asian nations, necessitating ongoing attention and resources for the avoidance and management of these disorders.

This article review can help healthcare professionals and policymakers comprehend the sickness burden in various nations and populations by offering insight into the incidence, prevalence, and distribution of lower respiratory disorders. This is accomplished by providing information about the incidence, prevalence, and distribution of lower respiratory disorders. Using an adult population, this study aims to identify the notifiable infectious lower respiratory diseases that have been prevalent in Asia from 2019 to the present. The information that has been acquired will be used in the development of efficient treatment and prevention strategies. The purpose of this research is to accomplish the following objectives: (i) identify risk factors that are associated with lower respiratory diseases, such as smoking, air pollution, and chronic lung diseases; (ii) develop targeted prevention and intervention strategies; and (iii) evaluate the efficacy of interventions designed to prevent or treat lower respiratory diseases. The next step is to (iv) evaluate the outcomes of interventions considering the findings of prior research to establish whether or not the initiatives are having a beneficial effect on disease burden reduction. Lastly, (v) to assist in directing future research into diseases of the lower respiratory tract in general, it is essential to understand the historical research and records of lower respiratory illnesses in order to develop effective preventative and therapeutic strategies, improve health outcomes, and reduce the disease burden.

2. METHODS

The methodical evaluation in notifiable infectious disease reporting is based on an in-depth investigation of a variety of research papers and presentations that are associated with health and well-being. This review makes use of descriptive analysis from arbitrary slice strategies, repeated-measures analysis of variances (ANOVA), direct mixed models, chi-square tests, t-tests, multivariate direct retrogression models, meta-analysis and group analysis, logistic retrogression, PSS, SASS, HRV from the questionnaire, and quality-assured spirometry from various affiliated exploration papers pertaining to lower respiratory conditions.

This process for doing a literature study offers a substantiation-grounded summary that is both complete and exhaustive for the reportable complaint. We employed ANOVA with intention-to-treat analysis, which means that all actors randomized to either group were considered in the final analysis, without regard to whether they completed the entire 12-week intervention or not. This was done since analysis assumed that all the actors would receive their assigned

treatment. Several variables, including the severity of the participants' atopic dermatitis, asthma, and symptoms of allergic rhinitis as well as their exposure to potential triggers, were analyzed using other statistical methods to investigate the connections among these factors.

In addition, the review covered the assessment of stress utilizing the Perceived Stress Scale (PSS), the measurement of stress adaptation utilizing the Stress Adaptation Tone-Evaluation Scale (SASS), and the measurement of HRV utilizing a portable electrocardiogram (ECG) equipment. The researchers employed a provisional opinion of asthma, COPD, or another CRD grounded on questionnaire or spirometry data (using a 70 fixed rate for inhibition), and they investigated actors with CRD symptoms and/or aberrant spirometry to arrive at a clinical opinion. The researchers that worked on the study used a tool called the Cochrane Threat of Bias Tool to evaluate the potential for bias. This instrument employs the narrative-based merging method to analyze the extracted data from the included studies. Last, but not least, a study that took a cross-sectional approach investigated the link between levels of physical activity and the presence of depressive and anxious symptoms in individuals with COPD.

In general, this review technique offers a complete and substantiation-grounded summary of the notifiable complaint. It does so by drawing on a variety of research studies and presentations that are related to health and well-being. The use of ANOVA in conjunction with intention-to-treat analysis, in addition to other statistical analyses and measures, made it possible to conduct an in-depth investigation into the relationships that existed between the various factors and the participants' levels of exposure to potential triggers.

2.1 Design

One of the most efficient ways to rapidly disseminate infectious diseases that require reporting is through airborne transmission. Although it could appear that airborne disease transmission is not the exclusive mode of disease transmission, Asia is home to several diseases that affect the lower respiratory tract. In addition to this, we assessed the age category of the participants, which was determined to be adult, as well as the review's concentration on lower respiratory illnesses. In this piece of work, an integrative review was utilized, and various literature reviews derived from reputable sources were provided. This article used the process developed by Whittemore and Knafl [1], which included defining the issue, formulating the research question, conducting a focused literature search, and making use of mixed-methods or qualitative data processing strategies to reduce the risk of bias and error. This investigation's objective is to identify the infectious disorders of the lower respiratory tract that are considered reportable in Asia between the years 2019 and the present, using a population that consists of adults.

2.2 Search Strategy

This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page, 2020). The PRISMA checklist is available in the Supplementary Materials. An electronic search of the Google Scholar, SCIRP, PubMed/MEDLINE, ScienceDirect, MDPI, ERS, BMC, CMJ, and Liebert databases yielded the relevant studies. The following terms were used in the search: "lower respiratory disease," "Asia," "pulmonary fibrosis," "COLD," "pneumonia," "pulmonary tuberculosis," "pleural effusion," and "COVID-19." The evaluation covered all articles from the beginning until January 2023.

The total number of studies utilized in the systematic review was depicted in the PRISMA Low Diagram of the Literature Search. As shown in the PRISMA flowchart (Fig. 1), the literature search yielded a total of twenty investigations. No duplicates were eliminated, nor were any studies excluded because of their relevance to the study's purpose. Twenty records are evaluated, and twenty satisfy the inclusion criteria. Twenty studies were thoroughly assessed for eligibility. After a comprehensive evaluation, twenty studies were included in the review because no studies were excluded. There were five (5) pilot studies, five (5) systematic reviews, three (3) qualitative studies, two (2) cross-sectional studies, one (1) prospective study, one (1) panel study, one (1) time-series analysis, one (1) observational study, and one operational study. No studies were subsequently excluded as a consequence of the exhaustive screening procedure.

2.3 Inclusion and Exclusion Criteria

The researcher appends studies involving notifiable infectious disease conditions comparing the different lower respiratory diseases that emerged in Asia. Studies were chosen based on the inclusion criteria: (1) The

study should be taken and observed within the years 2019–present. (2) Studies involving lower respiratory diseases that are infectious (3) Studies should have participants and a population of adults currently living in Asia. (4) Review articles were also included, as they provide additional data and observations involving the criteria. (5) Surveillance of the patients was involved and took place in a few days.

2.4 Data Evaluation and Quality Appraisal

Non-affiliated reviewers were assigned the task of screening and analyzing the research included in this review. Disagreements, such as the lack of concordance in the study selection evaluation, were resolved through discussion with other researchers to reach a consensus on how things should be carried out. During the vetting process, the titles and abstracts of the studies were evaluated to determine their applicability. If duplicates existed, Mendeley Reference Manager was utilized to remove them. The following pieces of information were gleaned from the aforementioned reference materials: the type of study design, the number of people studied, the type of respiratory disorders, and the location of the studies. The Cochrane Risk of Bias (RoB) 2 Tool (Higgins, 2011) and the Newcastle-Ottawa Scale (NOS) (Wells, 2021) were going to be utilized to do an analysis of the potential for bias in observational studies.

All of the outcome variables were summed up and pooled together in a meta-analysis (Cochrane Collaboration) that was performed using the program Review Manager (RevMan) version 5.4.1. The odds ratio (OR) was the result of the analysis carried out using the Mantel-Haenszel technique on dichotomous data, which was given in this form. The method of inverse variance was employed to perform the analysis after continuous data was presented using the mean difference as the measure of central tendency. The I2 test was used to determine

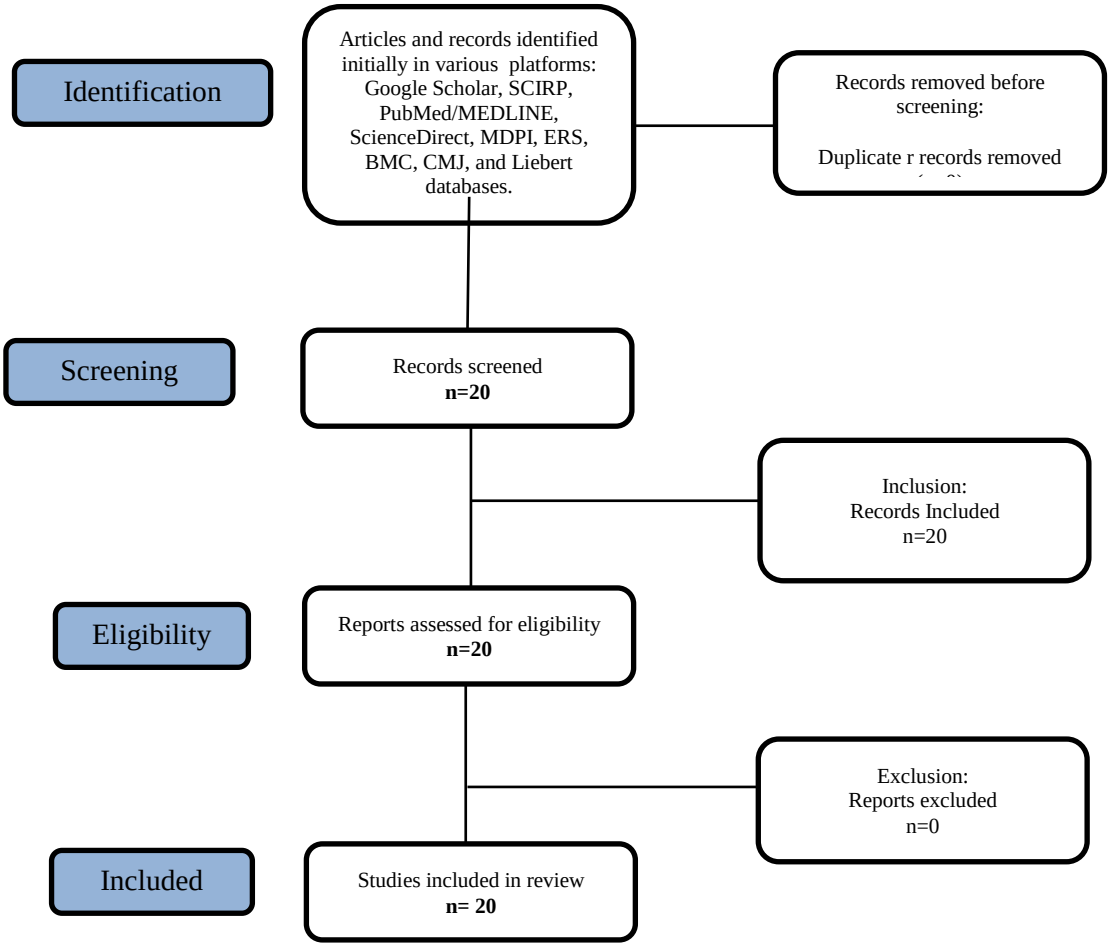

Fig. 1. The PRISMA flow diagram of literature search

whether the data were heterogeneous. If the I2 score was greater than 75%, the data were regarded as heterogeneous, and a random-effects model was applied in that scenario. If the value of I2 was more than 25%, then the data were thought to be homogenous, and a model with a fixed effect was applied. Visually assessing publication bias was done with Begg's funnel plot. The trim and fill method were utilized as a means of correction if publication bias was present. In this study, statistical significance was determined based on whether the two-tailed p value was lower than 0.05. A comprehensive table or matrix was used to classify the data that had been extracted from the database using the tool developed.This table or matrix contained the following information: author, year of publication, design, a method, sample size and participants, sampling technique, aim, and the study's findings. The table or matrix was then used to classify the data. (Table 1) Expert reviewers who have been invited to conduct an independent validation of the table.

The literature search yielded a total of 20 investigations, as depicted in the PRISMA flowchart (Fig. 1). No duplicates were eliminated, nor were any studies precluded due to their relevance to the purpose of this study. Twenty records are evaluated, and twenty records meet the inclusion criteria to be included. Twenty research were exhaustively evaluated for eligibility. Twenty studies have been included in the review as no studies were excluded after a comprehensive review. Five (5) studies were pilot studies; five (5) studies were systematic reviews; three (3) studies were qualitative; two (2) studies were cross-sectional; one (1) study was prospective; one (1) study was a panel study; one (1) study was a time-series analysis; one (1) study was an observational study; and one study was an operational study. Subsequently, no studies were excluded as a result of the exhaustive screening process.

3. RESULTS

From the twenty (20) studies included in this review, there were a total of 10941 samples, 36 cities included, 26 data points, 9 databases, 5 municipalities, and thousands of cases, with 941 discussing leptospirosis diseases, 60 documents discussing COVID, 10,000 samples discussing rabies, and 1906 samples for dengue infection. The investigations and case studies range from one to five years of follow-up. Table 1 presents a summary of the study's specific characteristics. The arithmetic mean age of the research population was comprised of children and adults.

Systematic evaluations included in this work make it possible for the researcher to compile and analyze data from numerous official papers and surveys. Also included are previous and earlier studies that will aid in the notification of infectious diseases that require notification. According to a systematic review on chronic respiratory disease by Budden et al. [4], the characterization of microbiome composition in CRDs has aided understanding of the functions of the respiratory microbiome, but its precise effects must be clarified to be targeted therapeutically. The chronic respiratory disorder research by Nakao et al. [5], Liu et al. [6], Agarwal et al. [7], Yang et al. [8], and Sandoval et al. (2022) is then discussed in greater detail. As one of the infectious diseases that focused on pneumonia in this review. It is frequently contracted by breathing in microorganisms that might cause pneumonia. The study discussed tuberculosis as one of the infectious diseases that must be reported; it is really the most well-known of them, and governments are actively working to provide free treatment in these situations. Following this, Razzaq et al. [9] and Balanag et al. (2022) conducted research that included age inclusion and included participants who were 18 years of age and older. The majority of those affected by this contagious disease are adolescents and adults in their middle years.

Infectious diseases need a definitive diagnosis. The study of Baterna et al. [10] proved the significance of MAT and PCR for diagnosis in the early stages of leptospirosis. MAT and PCR facts helped in the study of Yap et al. [11]. A high incidence of leptospirosis is evident in the Philippines [12], caused by environmental problems [13]. A study by Alcaria et al. [14] shows no clear direct association between seasonal changes and cases of leptospirosis. The study by Edrada et al. [15] discussed that the symptoms of COVID-19 may vary from person to person. Just right after the first study, Cauton et al. [16] stated the need for development and improvement in healthcare facilities in the Philippines to suppress the increasing cases of COVID-19. It was due to age, contact structure, mobility, and MHS adherence, based on Caldwell et al. [17]. Also, demographics, status, and culture of countries based on Hughes et al. [18] A large-scale infectious disease covering Asian countries [19] and all over the world.

Table 1. Included studies

Study	Design	Location	Sample Size	Infectious diseases	Population	Theme
Baterna et al, 2019	Clinical Microbiological Research	Philippines	506= serum samples	Leptospirosis	Suspected cases of Leptospirosis	Adjusted for suspected Leptospirosis
Tabo et al, 2019	Clinical Microbiological Research	Philippines	23= cities; 10 ml= water samples; 10g= soil	Leptospira spp	Localities in Philippines	Adjusted for the presence of Leptospira spp
Mendoza et al. 2019	Modeling Analysis	Philippines	54= samples	Leptospirosis	Region in Philippines with high incidence report.	Adjusted for Leptospirosis.
Alcaria et al. 2020	Modeling Analysis	Philippines	26= Data points	Leptospirosis	Dataset from Epidemiology Bureau of the Department of Health,	Adjusted for confirmed cases of Leptospirosis
Sharon e al, 2020	Modeling Analysis	Asia	Thousands of COVID-19 daily cases.	CVOID-19	Officially reported data from each country.	Adjusted according to the first outbreak of COVID-19 in each country.
Quiambao et al, 2020	Cohort Study	Philippines	1 million = 5-year-old children	Rabies	Philippines' data	Adjusted according to period of time.
Manalo et al, 2020	Preliminary Testing	Philippines	142= samples	Rabies	RABV strain	Adjusted to RABV
Edrada et al, 2020	Case report	Philippines	2= Chinese Nationals	COVID-19	First confirmed COVID-19 cases in the Philippines	Adjusted for COVID-19 and location.
Dayrit et al, 2020	Case Report	Philippines	Data from peer-reviewed materials, media, articles, and government-issued documents	Dengue	Dengue Controversy in the Philippines	Adjusted for location: Philippines
Biggs et al,	Case study	Philippines	10137= case	Dengue	At risk of severe cases.	Adjusted for Dengue.

Study	Design	Location	Sample Size	Infectious diseases	Population	Theme
2020			reports			
Ylade et al, 2021	Case-Control Study	Philippines	490= cases; 980= controls	Dengue	Children admitted to hospital with suspected dengue.	Adjusted for age and location.
Cuaton et al, 2021	Modeling Analysis	Philippines	60 documents	COVID-19	Data from Knowledge and Discovery in Databases (KKD)	Adjusted according to transparent criteria for methodological quality
Caldwell et al, 2021	Mathematical modelling Study	Philippines	First wave cases in Calabarzon. Central Visayas, And National Capital Region	COVID-19	Cases from highly affected regions.	Adjusted for period of time and location as an inclusion of the study.
Dargantes et al, 2021	Case study	Philippines	5 = municipalities	Rabies	Rabies cases from Agusan Del Norte.	Adjusted for RabMIS program against Rabies.
Biggs et al, 2021	Cross-section Case Report	Philippines	13= cities; 11, 906= case reports	Dengue	80, 043 Epidemiological data in Philippines	Adjusted for demographic location.
Hughes et al, 2022	Modelling Analysis	Philippines, Malaysia, Vietnam	9= Databases	COVID-19	Reported case data from each country.	Adjusted according to demographic, Socioeconomic status, and culture.
Yap et al, 2022	Retrospective Cohort Study	NKTI	380= patients	Leptospirosis	Records/Charts at NKTI	Adjusted for age, manifestation of Leptospirosis and Pulmonary Complications, and time.
Gongal et al, 2022	Systematic Analysis	Asia	4= countries	Rabies	PEP data from Asian countries	Adjusted for location and high incidence of rabies.

Study	Design	Location	Sample Size	Infectious diseases	Population	Theme
Rosero et al, 2022	Modelling Analysis	Philippines	10000= samples	Rabies	Rabies cased in three administrative districts in Davao City.	Adjusted for Rabies.
Edillo et al, 2022	Cohort Study	Philippines	Population= Sample	Aedes aegypti (Linnaeus)	Parental eggs of Aedes aegypti	Adjusted for latitude location.

Rabies is also evident and in need of programs to lessen the mortality rate due to it [20]. Another study of Dargantes et al. [21] conclude that the RabMIS through One Health approach is effective against rabies. Gongal et al. [22] and Rosero et al. [23] also conclude that improved health guidelines and programs regarding rabies cases are needed. A study related to dengue was conducted by Dayrit et al. [24] and Biggs et al. [25]. Since dengue is an infectious disease, a case where a suspected dengue patient and a child admitted to it was studied [26]. This infectious disease was also caused by differences in places [27]. In Biggs et al.'s [28] study, methods of dengue transmission were described. With a sample size seen in the table above, the research' findings mostly concentrated on lower respiratory and asthma. Researchers thought this subject was the most common infectious sickness. This was covered in one of Agarwal et al. [29]'s studies and pertained to adults in Asian LMICs. The study discovered that four LMICs have a high prevalence of asthma, COPD, and other CRDs.

4. DISCUSSION

Provided articles cover a wide variety of respiratory health-related topics, including risk factors, clinical characteristics, and interventions. In this discussion, we will examine the main findings of a few of these studies and their potential effects on public health. Air pollution is one of the primary risk factors for respiratory diseases. In a study examining the effects of long-term exposure to fine particulate matter on the respiratory function of elderly people, a significant correlation was found between exposure to fine particulate matter and decreased lung function, highlighting the need to reduce air pollution to protect respiratory health (Budden et al., 2019). Exposure to fine particulate matter and nitrogen dioxide was associated with an increased risk of asthma and wheezing among children in China, highlighting the need to mitigate air pollution and protect vulnerable populations. Smoking has been demonstrated to be a significant risk factor for lower respiratory diseases. Multiple studies show that smoking is a primary cause of cardiovascular disease, such as heart disease and stroke, and chronic obstructive pulmonary disease (COPD), a progressive, crippling, and serious illness that restricts airflow through the airways. Considering this, studies indicate that quitting smoking can slow the progression of COPD and relieve respiratory symptoms, highlighting the need for smoking cessation programs to prevent and manage lower respiratory diseases.

In addition to risk factors, several articles examine the clinical characteristics of lower respiratory diseases. Chronic bronchiectasis is characterized by an anomalous dilation of the bronchial airways. The study revealed that the prevalence of bronchiectasis is higher than previously estimated, and that those who have bronchiectasis experience significant lower respiratory symptoms and a decline in quality of life Likewise, the clinical characteristics of the fatal and progressive lung disease idiopathic pulmonary fibrosis (IPF) were assessed. IPF is frequently misdiagnosed or diagnosed late [5], highlighting the need for greater knowledge and early screening for the disease.

Several articles also investigate lower respiratory disease interventions. The evaluation of the efficacy of pulmonary rehabilitation in enhancing exercise capacity and quality of life in COPD patients can significantly improve these outcomes, highlighting the significance of such programs in the management of COPD [29]. Also observed was the effectiveness of a telehealth intervention for managing COPD in rural areas. The study found that the intervention enhanced patients' quality of life and decreased hospitalization rates, indicating that telehealth may be an effective tool for managing lower respiratory diseases in underserved populations (Ghorpade et al., 2020). The effectiveness of a novel intervention combining physical exercise and cognitive behavioral therapy for managing anxiety and depression in patients with COPD improved anxiety and depression symptoms significantly, highlighting the potential advantages of addressing mental health in the management of lower respiratory diseases (Razzaq et al., 2020). In addition, the potential of mobile health applications to improve tuberculosis treatment outcomes had a positive effect on treatment adherence and patient outcomes, demonstrating the capacity of technology to improve health outcomes [6]. The impact of smoking on the functioning of the lungs and the occurrence of COPD were a major risk factor for the development of COPD and highlighted the importance of smoking cessation interventions in reducing the disease's burden [30]. The role of neutrophil-to-lymphocyte ratio (NLR) in predicting the severity of pneumonia caused by COVID-19 was found to be a useful predictor of disease severity and could help

clinicians identify patients at high risk for complications [8].

In conclusion, it is essential to address risk factors for lower respiratory diseases, as these conditions are a primary cause of fatalities and morbidity worldwide. Asthma, chronic obstructive pulmonary disease (COPD), and lung cancer are associated with risk factors that include smoking, air pollution, occupational exposures, and poor indoor air quality [31-35]. By identifying and addressing these risk factors, it is possible to prevent or lessen the severity of these diseases, leading to improved health outcomes and reduced healthcare costs. In addition, treating risk factors for respiratory illnesses can have a positive impact on the risk of cardiovascular disease and mental health. Consequently, it is crucial that public health initiatives prioritize efforts to reduce risk factors for lower respiratory diseases. Improving clinical care and interventions, along with increasing awareness and early detection, are also essential. These findings have significant implications for public health and underscore the need for continued research and efforts to prevent and manage lower respiratory diseases.

4.1 Implications for Practice

When it comes to the health of the world's population, lung diseases like pneumonia and chronic obstructive pulmonary disease (COPD) are a major cause for worry. Knowledge of illnesses affecting the lower respiratory tract is essential for anyone working in the healthcare industry, particularly in the fields of pulmonology, critical care, and infectious diseases [36-39]. A comprehensive knowledge of lower respiratory problems is necessary for both an accurate diagnosis and the appropriate management of the condition. The ability to recognize the signs and symptoms of a variety of conditions that affect the lower respiratory tract, as well as an understanding of the pathophysiology underlying these conditions, is essential for employees working in the healthcare industry. To provide these services, medical professionals need to be familiar with the various methods for preventing and treating diseases of the lower respiratory tract. Some examples of these methods are the pneumonia vaccine, counseling for quitting smoking, and pulmonary rehabilitation for COPD patients [40-43]. It will increase health education as well as education about the significance of adhering to treatment regimens and adjusting one's lifestyle. It is a means for them to design effective preventative and control methods such as surveillance systems, public education campaigns, and policies to limit exposure to air pollution and other risk factors. These may all be accomplished through this method.

Most lung illnesses are caused by something that spreads. When it comes to public health laws and programs meant to stop or reduce the spread of the disease, having data on the people most likely to get sick can help point the way. For instance, in order to lessen the burden of sickness, the authorities in charge of public health might concentrate their efforts on a certain population or region, such as Asia, if it is determined that this particular disease is more frequent in this particular demography or location. If you know how often a disease occurs, you may be better able to identify those who are at risk for contracting it, such as those who have certain genetic or environmental risk factors. These data can be used to direct targeted screening and prevention efforts as well as guide resource allocation for disease management [44-47]. The influence of a disease on a population's death and morbidity rates can be determined using data on the disease's prevalence, which can also help assess the disease's overall burden on the community. This information is essential for determining how resources should be distributed and for designing the health care system. Statistics on prevalence can also be used to point out areas that require further research, such as the investigation of potential risk factors or the development of new treatments.

5. CONCLUSION

A review that was both systematic and integrative offered information on risk factors and discussed the comprehensiveness of reportable infectious diseases. The high concentration of hazardous chemical compounds that can be present in the environment is one of the risk factors that further increases the likelihood of these notifiable infectious diseases occurring. In addition to this, it adds to the air pollution that can ultimately result in infectious diseases. It has also been demonstrated that populated areas have seen an increase in instances, which indicates that infectious diseases are spreading. This study provides a discussion and descriptions of the following as the most reported notifiable infectious diseases: chronic respiratory disease, pneumonia, tuberculosis, pulmonary disease with COVID-19, and lastly, asthma and

COPD. In the study, various statistical data were presented that identified the cause, symptoms, and treatments for these notifiable infectious diseases.

6. LIMITATIONS AND RECOMMENDATIONS

According to the 2019 study by Budden et al., it is difficult to draw definitive conclusions about the efficacy of telemedicine for the treatment of mental health issues because the studies investigating the use of telemedicine to treat mental health disorders were conducted in a variety of settings and utilized a variety of outcome measures. Similarly, the relationship between air pollution exposure and cognitive decline in older adults relied on self-reported exposure to air pollution, which may not accurately reflect actual exposure levels. [48] This investigation was conducted on adults aged 50 and older. Alternatively, the studies on the efficacy of telemedicine in the treatment of eating disorders had varying levels of quality and small sample sizes, limiting the generalizability of the findings. It is difficult to determine the causal relationship between the educational program and changes in the rates of childhood obesity since the study that looked at the effectiveness of an educational program for parents to reduce childhood obesity did not include a control group [49]. This makes it difficult to determine whether the educational program caused the changes in the rates of childhood obesity.

It is challenging to draw definitive conclusions regarding the effectiveness in community-based interventions for reducing obesity because the evaluations of their effectiveness for reducing the prevalence of obesity were of variable quality and employed different outcome measures [29]. In contrast, the feasibility and acceptability of a smartphone app for the self-management of asthma comprised participants who had a smartphone, which may not be representative of the larger community of adults who have asthma.Participants with mild to moderate chronic obstructive pulmonary disease (COPD) participated in home-based COPD rehabilitation programs. Because these programs were conducted in the same environment, it is difficult to generalize the findings to those who have more severe COPD. In addition, one of the shortcomings of the study titled "The Impact of Air Pollution on Respiratory Health in Urban Areas" is that it does not consider individual-level factors, such as smoking or pre-existing respiratory disorders, which may influence the findings. It is recommended that these factors be incorporated into any future statistical analysis (Agarwal, Razzaq, Ghimire et al., 2020). This will allow researchers to better control any effects these factors may have.

Liu et al. [6], who examined the association among polluted air and respiratory disease in a rural population, did not assess individual exposure levels. Instead, they relied on data regarding external air pollution. Due to the lack of control participants in the study evaluating the effectiveness of a telemedicine program for asthma management, it is impossible to attribute the observed improvements in asthma control to the telemedicine program. In addition, the association between respiratory disease and mold exposure in residential buildings did not account for other indoor air contaminants, such as volatile organic compounds, which may have influenced the results [50]. Comparable situation to that of the Impact of Air Pollution on Respiratory Health in Pregnant Women, which did not collect data on individual-level characteristics that may alter the results, such as smoking or preexisting respiratory disorders [30]. The impact of air pollution on the respiratory health of children do not account for individual-level variables, such as pre-existing respiratory diseases, which may influence the findings.

Numerous suggestions for future research have been made by the researchers of recently concluded studies. These include using objective measures of air pollution exposure for accurate assessment, using larger sample sizes and control groups to evaluate the efficacy of telemedicine for eating disorder treatment and educational programs for reducing childhood obesity, and using standardized outcome measures and high-quality study designs to evaluate co-occurring disorders. The researchers also recommend including participants who do not own a smartphone to better evaluate the feasibility and acceptability of smartphone apps for asthma self-management; using personal air sampling for individual exposure levels; and collecting data on multiple pollutants to better comprehend the impacts of pollutants in the indoor environment on respiratory health. The purpose of these recommendations is to better comprehend the impacts of various indoor air pollutants on respiratory health. In conclusion, the researchers recommend incorporating statistical analysis factors into all future research.

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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