DOI: https://doi.org/10.61841/4hq3d003 Publication URL: https://nnpub.org/index.php/MHS/article/view/2224

THE EFFECT OF INTEGRATED USE OF DISEASE IN MANAGAMENT INTERVENTIONS IN ASTHMA AND COPD: A TEN YEARS SYSTEMATIC REVIEW

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ABSTRACT

Background: *Asthma and COPD affect an estimated 64 million and 235 million people respectively, worldwide. Obstructive lung disease evaluation and therapy was based on severity and in accordance with current asthma and COPD treatment guidelines.*

The aim: *The aim of this study to show about the effect of integrated use of disease in management interventions in asthma and COPD.*

Methods: *By the Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, this study was able to show that it met all of the requirements. This search approach, publications that came out between 2014 and 2024 were taken into account. Several different online reference sources, like Pubmed, SagePub, and Sciencedirect were used to do this. It was decided not to take into account review pieces, works that had already been published, or works that were only half done.*

Result: *Five publications were found to be directly related to our ongoing systematic examination after a rigorous three-level screening approach. Subsequently, a comprehensive analysis of the complete text was conducted, and additional scrutiny was given to these articles.*

Conclusion: *IDM is defined as "a group of coherent interventions, designed to prevent or manage 1 or more chronic conditions using a community wide, systematic and structured multidisciplinary approach potentially employing multiple treatment modalities". IDM typically has several components, such as self-management education, skills training, care management, and structured follow-up.*

Keyword: *Asthma, COPD, management, integrated disease management (IDM).*

INTRODUCTION

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are highly prevalent chronic obstructive lung disorders, which often impact multiple facets of affected people's lives, including their emotional well-being, social interactions, and overall quality of life. Traditional diagnostic pathways focussed on physiological measurement, such as lung function and blood tests, however, physiological outcomes cannot fully explain a patients well-being. Therefore, holistic care models are necessary to capture both physiological measurement and other components affecting the quality of life, such as functional limitation, comorbidities and other symptoms. The chronic care model (CCM) is such a model that aims to improve prevention, diagnosis, and management in patients with a chronic diseas. Various chronic care models have been proposed, identifying at least 5 essential components: per-patient tailered care, patient self-management abilities, multidisciplinary approach, patient oriented logistical infrastructure and implementation of electronic devices.[1–3]

Integrated care is a model of health care designed to improve delivery of care by increasing access to care and providing disease and self-care focused education. Enthusiasm for integrated care in patients with COPD was high after several studies showed that it decreased symptoms, improved health care delivery, enhanced quality of life and reduced health care utilization. But this excitement dampened after 2 well-designed clinical trials found that integrated care was unexpectedly associated with increased COPD-related hospitalizations, emergency department visits and all-cause mortality for reasons that remain unclear.[4,5]

Different healthcare providers, such as doctors, nurses, and physiotherapists, typically provide different types of care to people with COPD (e.g. prescribe medication, guide self-management, provide education, present exercise training). Previously, people with COPD could visit one or more different healthcare providers, and these providers would work independently. The goal of an integrated disease management (IDM) programme is to include different components of care by which different healthcare providers are co-operating and collaborating to provide more efficient care of better quality.[6–8]

Evidence suggests that integrated disease management (IDM), which utilizes a team care model that supports physicians and patients to improve best-practice implementation, may be a transformative approach. The team care model can narrow the knowledge-to-care implementation gap and concurrently improve health outcomes in COPD. IDM has been defined as “a group of coherent interventions designed to prevent or manage one or more chronic conditions using a systematic, multidisciplinary approach, and potentially employing multiple treatment modalities”. The goal of chronic disease management is “to identify persons at risk… to promote self-management by patients, and to address the illness… with maximum clinical outcome, effectiveness, and efficiency.” IDM includes the “collaborative self-management” or “supported self-management” currently recommended by international guidelines. These strategies include a patient action plan to support early intervention to mitigate the impact of severe exacerbations on symptoms and QoL.[9–11]

METHODS

Protocol

By following the rules provided by Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2020, the author of this study made certain that it was up to par with the requirements. This is done to ensure that the conclusions drawn from the inquiry are accurate.

Criteria for Eligibility

For the purpose of this literature review, we compare and contrast the effect of integrated use of disease in management interventions in asthma and COPD. It is possible to accomplish this by researching of the effect of integrated use of disease in management interventions in asthma and COPD. As the primary purpose of this piece of writing, demonstrating the relevance of the difficulties that have been identified will take place throughout its entirety.

In order for researchers to take part in the study, it was necessary for them to fulfil the following requirements: 1) The paper needs to be written in English, and it needs to determine about the effect of integrated use of disease in management interventions in asthma and COPD. In order for the manuscript to be considered for publication, it needs to meet both of these requirements. 2) The studied papers include several that were published after 2014, but before the time period that this systematic review deems to be relevant. Examples of studies that are not permitted include editorials, submissions that do not have a DOI, review articles that have already been published, and entries that are essentially identical to journal papers that have already been published.

Search Strategy

We used " the effect of integrated use of disease in management interventions in asthma and COPD.” as keywords. The search for studies to be included in the systematic review was carried out using the PubMed, SagePub, and Sciencedirect databases by inputting the words: *((*"Asthma*"[MeSH Subheading] OR* "COPD*"[All Fields] OR* "risk factor*" [All Fields])*

*AND ("*Diagnosed*"[All Fields] OR "* Management*"[All Fields]) AND ("*Treatment*"[All Fields]) OR ("*Outcome*" [All Fields]))* used in searching the literature.

Data retrieval

After reading the abstract and the title of each study, the writers performed an examination to determine whether or not the study satisfied the inclusion criteria. The writers then decided which previous research they wanted to utilise as sources for their article and selected those studies. After looking at a number of different research, which all seemed to point to the same trend, this conclusion was drawn. All submissions need to be written in English and cannot have been seen anywhere else.

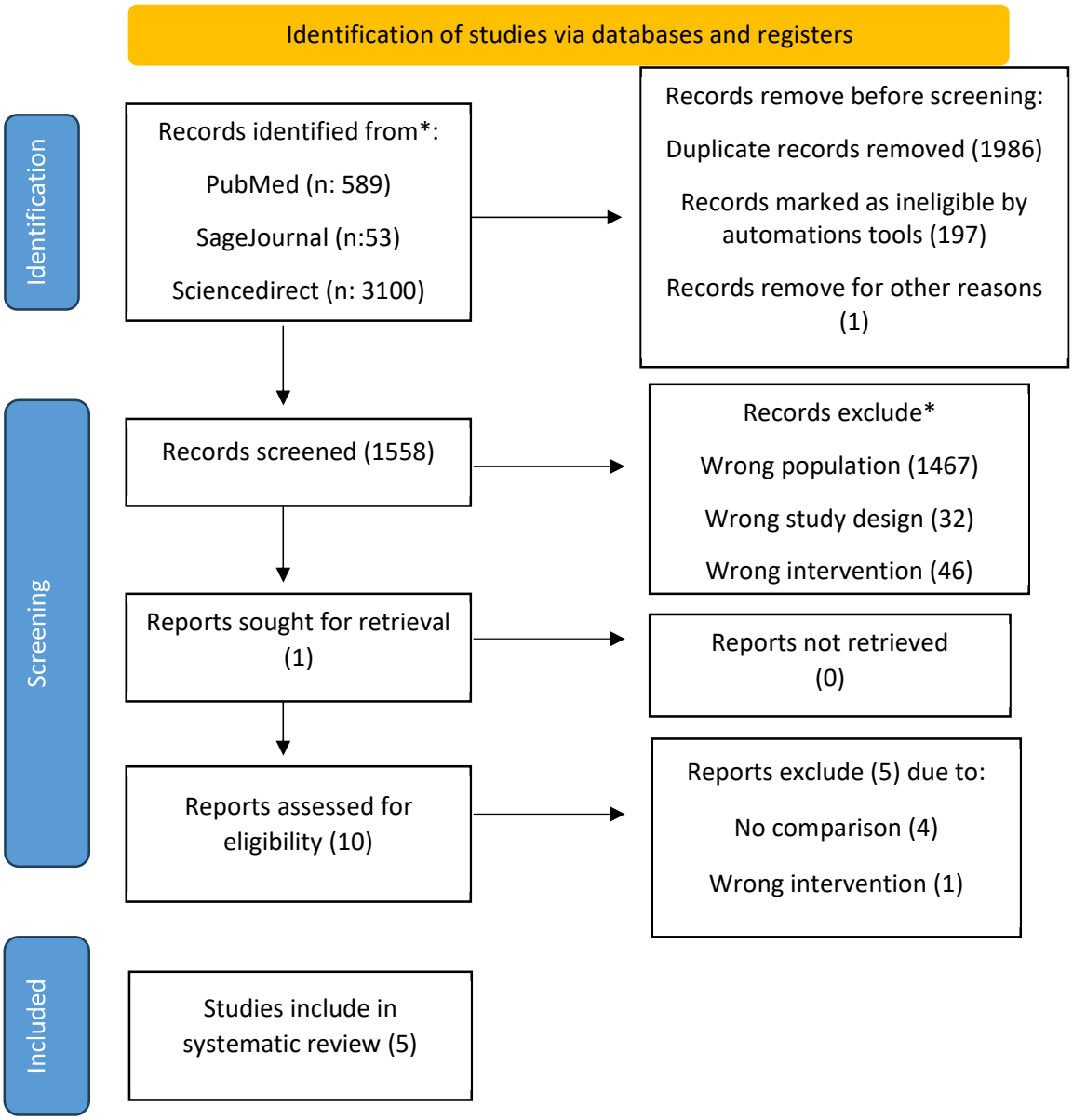

Figure 1. Article search flowchart

Only those papers that were able to satisfy all of the inclusion criteria were taken into consideration for the systematic review. This reduces the number of results to only those that are pertinent to the search. We do not take into consideration the conclusions of any study that does not satisfy our requirements. After this, the findings of the research will be analysed in great detail. The following pieces of information were uncovered as a result of the inquiry that was carried out for the purpose of this study: names, authors, publication dates, location, study activities, and parameters.

Quality Assessment and Data Synthesis

Each author did their own study on the research that was included in the publication's title and abstract before making a decision about which publications to explore further. The next step will be to evaluate all of the articles that are suitable

for inclusion in the review because they match the criteria set forth for that purpose in the review. After that, we'll determine which articles to include in the review depending on the findings that we've uncovered. This criteria is utilised in the process of selecting papers for further assessment. in order to simplify the process as much as feasible when selecting papers to evaluate. Which earlier investigations were carried out, and what elements of those studies made it appropriate to include them in the review, are being discussed here.

RESULT

Using reputable resources like Science Direct, PubMed, and SagePub, our research team first gathered 3742 publications. A thorough three-level screening strategy was used to identify only five papers as directly relevant to our ongoing systematic evaluation. Next, a thorough study of the entire text and further examination of these articles were selected. Table 1 compiles the literature that was analyzed for this analysis in order to make it easier to view.

Table 1. The litelature include in this study

Author	Origin	Method	Sample	Result
Jain, VV et al.,2014[12]	USA	CLDP elements included clinical evaluation, onsite pulmonary function testing, health education, and self-management action plan along with close scheduled and on-demand follow-up.	106	A total of 106 patients were enrolled, and 104 patients were subject to analyses. During the year of follow-up after CLDP enrollment, there was a significant decrease in mean RER (0.56 ± 1.48 versus 2.62 ± 2.81, $p < 0.0001$), mean RHA (0.39 ± 0.08 versus 1.1 ± 1.62, $p < 0.0001$), and 30 day rehospitalizations (0.05 ± 0.02 versus 0.28 ± 0.07, $p < 0.0001$). Reduction of healthcare utilization was strongly associated with GERD and sinusitis therapy, and was independent of pulmonary rehabilitation. Direct variable cost analyses estimated annual savings at $1.17 million. Multivariate logistic regression analysis revealed lack of spirometry utilization as an independent risk factor for severe exacerbations.
Luo, G et al., 2021[13]	USA	We will use temporal features to accurately predict proneness to exacerbation, automatically find modifiable temporal risk factors for every high-risk patient, and assess the impact of actionable warnings on clinicians' decisions to use integrated disease management to prevent proneness to exacerbation.		We have downloaded 2005-2020 weather and air quality data from public sources. For the clinical and administrative data, GL at UWM has obtained the 2005-2018 data of patients with asthma from IH, the 2009-2018 data of patients with asthma from KPSC, and the 2011-2018 data of patients with asthma from UWM. We are retrieving the other clinical and administrative data, mostly of patients with COPD, from IH, UWM, and KPSC. We intend to complete the study in 6 years.

Hussey, AJ et al., 2021[14]	Canada	This historical cohort study included patients enrolled for 12 (±3 months) in the Best Care COPD IDM program.	571	Data for 571 patients (*all patients)* were included, 158 met the reference RCT eligibility *(RCT matched)*. Improved QoL was observed in 43% (95% CI:38.9,47.2) of *all patients*, 47% (95% CI:39.5,55.6) of *RCT matched* vs 92% (95% CI:79.2,95.1) in the reference RCT intervention arm (n=72). Reductions (12 months IDM vs prior year) were observed in the proportion of patients experiencing exacerbation-related events (*all patients*): antibiotics/prednisone (−9.0%,95% CI:-13.9,-3.9); unscheduled physician (−33.1%,95% CI:-38.2,-27.9); emergency department (−9.6%,95% CI:-13.5,-5); and hospitalizations (−6.8%,95% CI:-10.0,-3.7). For the *RCT matched group* all reductions were comparable to the reference RCT intervention arm. The strongest predictors of improved QoL were baseline CAT, CAT≥20 vs CAT<10 (OR 15.6,95% CI:7.91,30.83), GOLD group B (OR 6.4,95% CI:3.42,11.85) and D (OR 5.64,95% CI:2.80,11.37) vs GOLD group A. Patients with prior antibiotic/prednisone use, FEV_1 <30% predicted and GOLD group D were less likely to have no urgent health service utilization (OR 0.5,95% CI:0.30,0.68), (OR 0.2,95% CI:0.07,0.78) and (OR 0.3,95% CI:0.14,0.51), respectively.
Kruis, AL et al., 2014[15]	Netherlands	24 month, multicentre, pragmatic cluster randomised controlled trial	1086	Of a total of 1086 patients from 40 clusters, 20 practices (554 patients) were randomly assigned to the intervention group and 20 clusters (532 patients) to the usual care group. No difference was seen between groups in the CCQ at 12 months (mean difference –0.01, 95% confidence interval –0.10 to 0.08; P=0.8). After 12 months, no differences were seen in secondary outcomes between groups, except for the PACIC domain "follow-up/coordination" (indicating improved integration of care) and proportion of physically active patients. Exacerbation

				rates as well as number of days in hospital did not differ between groups. After 24 months, no differences were seen in outcomes, except for the PACIC follow-up/coordination domain.
Kamp, EPT et al., 2017[16]	Netherlands	The parallel cohort design includes 3 levels of integration in IDM (groups 1, 2, 3) and randomization of 2 levels of personal assistance for patients (group A, high assistance, group B, low assistance).	702	Of the 702 invited patients, 215 (30.6%) registered to a platform. Of these, 82 participated in group 1 (high integration IDM), 36 in group 1A (high assistance), and 46 in group 1B (low assistance); 96 participated in group 2 (medium integration IDM), 44 in group 2A (high assistance) and 52 in group 2B (low assistance); also, 37 participated in group 3 (no integration IDM). In the total group, no significant difference was found in change in CCQ trend (*P*=.334) before (–0.47% per month) and after the intervention (–0.084% per month). Also, no significant difference was found in CCQ changes before versus after the intervention between the groups with high versus low personal assistance. In all subgroups, there was no significant change in the CCQ trend before and after the intervention (group 1A, *P*=.237; 1B, *P*=.991; 2A, *P*=.120; 2B, *P*=.166; 3, *P*=.945).

Jain, VV et al.,2014 showed the effectiveness of an integrated disease management program modeled for care of patients with recurrent exacerbations of severe asthma and COPD. Besides reducing preventable exacerbations, it may optimize continuity and transition of care post-hospitalization by providing a medical home for patients with both diseases. Further, it may improve utilization of spirometry and pulmonary rehabilitation programs. Pulmonologist-led integrated disease management programs should be promoted in the care of frequent exacerbators of asthma and COPD.[12]

Luo, G et al., 2021 showed IDM for asthma and COPD more proactive, effective, and efficient, improving outcomes and saving resources. Future studies will evaluate our methods for heart diseases, diabetes, and other diseases; deploy our methods at UWM, KPSC, and IH for IDM for asthma and COPD; and test the performance against the current IDM practice.[13]

Hussey, AJ et al., 2021 showed the heterogeneity of complex IDM interventions and the effectiveness of implementation contributes to the variability in published RCTs and is an important factor determining successful transition from study to program. Best Care COPD, a primary care COPD IDM program, improved QoL and reduced urgent health services similar to the reference RCT from which the program emanated. Nearly half the patients experienced a clinically relevant improvement in QoL and most commonly this improvement was observed in those with more severe COPD. In addition, an approximate 50% relative reduction in unscheduled physician visits, ED visits and hospitalizations was observed.[14]

Kruis, AL et al., 2014 showed an integrated disease management approach delivered in primary care showed no additional benefit compared with usual care, except improved level of integrated care and a self reported higher degree of daily activities. The contradictory findings to earlier positive studies could be explained by differences between interventions (provider versus patient targeted), selective reporting of positive trials, or little room for improvement in the already well developed Dutch healthcare system.[15]

Kamp, EPT et al., 2017 showed there is growing interest in the potential of Web-based self-management platforms to deliver more individually tailored self-management support integrated into the everyday lives of COPD patients to improve their quality of life. In this study, the e-Vita eHealth-supported COPD programs had no significant impact on the health status of COPD patients, health status showed no significant change before or after the introduction of the eHealth-supported programs, and no differences were found between the patient groups receiving different levels of personal assistance.[16]

DISCUSSION

With a global prevalence of over 299 million people living with chronic obstructive pulmonary disease (COPD) and almost 273 million people living with asthma in 2017, COPD and asthma are common chronic lung diseases. They are a worldwide public health concern and they increasingly affect the lives of patients due to climate change and pollution. The clinical and economic burden of asthma and COPD have been widely established. Both these respiratory diseases are typically treated and managed with drug therapies, often in the form of daily inhaled medication. Full adherence is important for optimal management and treatment of COPD and asthma. This is especially the case when patients become more vulnerable, such as during environmental disruptions or the current COVID-19 pandemic.[17,18]

Chronic lung diseases are the leading cause of disability and death worldwide. Of all chronic lung diseases, chronic obstructive pulmonary disease (COPD) and asthma are the most prevalent. There were approximately 251 million cases of COPD globally in 2015, and COPD is predicted to become the third leading cause of death by 2030. Approximately 300 million people have asthma worldwide, with a projected increase of an additional 100 million people by 2025. The impact of a health problem, measured by financial cost, morbidity, and other indicators, is called disease burden. It is often quantified in terms of disability-adjusted life years (DALYs) or quality-adjusted life years (QALYs). In 2017, the loss of DALYs was the first for COPD and the second for asthma. In addition, a loss in health-related quality of life (QoL) is seen in many patients (eg, a decline in health, increased hospital admissions, and high medication costs).[19,20]

Asthma and chronic obstructive pulmonary disease (COPD) are both common chronic respiratory disorders in primary care that cause considerable morbidity and mortality. Although typically classified as distinct entities, they both involve obstructive airflow limitation and inflammation, and some describe them as existing along the same spectrum. In the U.S., asthma affects 7.7% of the population (over 24 million people), a prevalence that has been rising for the past several decades. Although asthma can occur at any age, over a quarter of asthma sufferers in the U.S. are children. COPD tends to have an older demographic. It has an estimated prevalence of 6.5% (14 million people) in the U.S., but the condition is thought to be greatly underdiagnosed. COPD is the third most common cause of death in the U.S., behind heart disease and cancer.[21]

With the rising burden of chronic diseases, there is worldwide interest in how to better and more efficiently manage patients. Over the last two decades, asthma and COPD self-management interventions (SMIs) have played an important role in supporting people to optimise their self-management health behaviour on a day-to-day basis. The first asthma self-management paper was published at the end of the seventies. Knowledge that was gained in the asthma field was initially used to set up COPD SMIs. However, over the last 20 years, the fields of asthma and COPD self-management have each made significant steps forward, while mostly focusing on developing their own disease specific SMIs. Both asthma and COPD self-management are now recognised by the respiratory community and recommended by the guidelines.[22–24]

Integrated disease management (IDM) programmes provide structured, multidisciplinary care and address the complex nature of managing COPD. Administered by teams in both primary and secondary care settings, these programmes vary in composition. They often include pharmacological and non-pharmacological interventions (eg, treatment review, smoking cessation counselling, telemonitoring, etc.). Pulmonary rehabilitation is a well-known form of IDM; the organisation of two primary care programmes from Canada and Germany. A recent meta-analysis of 52 studies found improvements in disease-specific quality of life, exercise capacity and respiratory-related hospital admissions for patients with IDM. Despite this evidence of effectiveness, access and uptake remain limited.[25,26]

CONCLUSION

IDM is defined as “a group of coherent interventions, designed to prevent or manage 1 or more chronic conditions using a community wide, systematic and structured multidisciplinary approach potentially employing multiple treatment modalities”. IDM typically has several components, such as self-management education, skills training, care management, and structured follow-up.

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