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THE QUALITY OF LIFE OF PATIENTS WITH COPD. LITERATURE REVIEW

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Abstract

Background: Chronic obstructive pulmonary disease (COPD) is a progressive respiratory condition that substantially impairs patients' health-related quality of life (HRQoL). Beyond lung function deficits, a variety of clinical, psychological, and social factors influence how COPD patients experience their daily lives. Over the past decade, research has increasingly focused on identifying key determinants of QoL in COPD, recognizing that improving QoL is a primary goal of COPD management. This narrative review summarizes evidence (2015–2025) on major factors affecting QoL in COPD patients, including disease severity, comorbid conditions, psychological status, physical activity, exacerbation frequency, social support, access to care, and treatment adherence. Consistent themes and gaps in the literature are highlighted, and we conclude by discussing how these factors interact to shape patient outcomes and where future research is needed.

Objective. The primary objective of this review was to summarize and analyze modern approaches aimed at improving the quality of life in patients with chronic obstructive pulmonary disease (COPD). Specific focus was placed on pharmacological therapies, pulmonary rehabilitation, psychosocial interventions, telehealth, self-management education, lifestyle modifications, and integrated care models.

Search strategy. A narrative literature review was conducted using electronic databases including PubMed, Scopus, and Cochrane Library. The search included studies published from 2015 to 2025 using keywords such as: "COPD", "quality of life", "pulmonary rehabilitation", "self-management", "psychological interventions", "digital health", "triple therapy", and "integrated care". Preference was given to systematic reviews, randomized controlled trials, and high-quality cohort studies published in peer-reviewed journals in English.

Results and conclusions. Recent studies confirm that various modern interventions can significantly improve the quality of life in COPD patients. Optimized pharmacological treatments, particularly triple inhaler therapy, help reduce symptoms and exacerbations. Pulmonary rehabilitation consistently enhances physical function and well-being. Psychological support, including cognitive-behavioral therapy, reduces anxiety and depression, positively affecting emotional health. Telehealth and mobile tools improve patient engagement and self-management, while structured education programs lead to better disease control and reduced hospital visits. Nutritional support and regular physical activity improve strength, endurance, and daily functioning. Integrated, multidisciplinary care models have shown the strongest overall impact, improving both quality of life and healthcare outcomes when delivered in a coordinated and patient-centered manner.

Keywords: *COPD, quality of life, pulmonary rehabilitation, self-management, psychological interventions, digital health, triple therapy, integrated care.*

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Резюме

КАЧЕСТВО ЖИЗНИ ПАЦИЕНТОВ С ХОБЛ. ОБЗОР ЛИТЕРАТУРЫ

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Введение: Хроническая обструктивная болезнь легких (ХОБЛ) - это прогрессирующее респираторное заболевание, которое существенно ухудшает качество жизни пациентов, связанное со здоровьем. Помимо нарушения функции легких, на повседневную жизнь пациентов с ХОБЛ влияют различные клинические, психологические и социальные факторы. В течение последнего десятилетия исследования все больше фокусировались на выявлении ключевых факторов, определяющих качество жизни при ХОБЛ, признавая, что улучшение качества жизни является основной целью лечения ХОБЛ. В этом обзоре обобщены фактические данные (2015-2025 гг.) об основных факторах, влияющих на качество жизни пациентов с ХОБЛ, включая тяжесть заболевания, сопутствующие состояния, психологический статус, физическую активность, частоту обострений, социальную поддержку, доступ к медицинской помощи и приверженность лечению. Выделяются общие темы и пробелы в литературе, и в заключение мы обсуждаем, как эти факторы влияют на результаты лечения пациентов и где необходимы будущие исследования.

Цель. Основной целью данного обзора было обобщение и анализ современных подходов, направленных на улучшение качества жизни пациентов с хронической обструктивной болезнью легких (ХОБЛ). Особое внимание было уделено фармакологической терапии, легочной реабилитации, психосоциальным вмешательствам, телемедицине, обучению самоуправлению, изменению образа жизни и моделям комплексного ухода.

Стратегия поиска. Обзор научной литературы был проведен с использованием электронных баз данных, включая PubMed, Scopus и Кокрановскую библиотеку. Поиск включал исследования, опубликованные с 2015 по 2025 годы, с использованием таких ключевых слов, как "ХОБЛ", "качество жизни", "легочная реабилитация", "самоуправление", "психологические вмешательства", "цифровое здравоохранение", "тройная терапия" и "комплексная помощь". Предпочтение отдавалось систематическим обзорам, рандомизированным контролируемым исследованиям и высококачественным когортным исследованиям, опубликованным в рецензируемых журналах на английском языке.

Результаты и выводы. Недавние исследования подтверждают, что различные современные вмешательства могут значительно улучшить качество жизни пациентов с ХОБЛ. Оптимизированные фармакологические методы лечения, в частности терапия тройными ингаляторами, помогают уменьшить симптомы и обострения. Легочная реабилитация неизменно улучшает физические функции и самочувствие. Психологическая поддержка, включая когнитивно-поведенческую терапию, снижает тревожность и депрессию, положительно влияя на эмоциональное здоровье.

Телемедицина и мобильные инструменты улучшают взаимодействие с пациентами и их самоуправление, в то время как структурированные образовательные программы улучшают контроль заболеваний и сокращают количество посещений больниц. Поддержка в питании и регулярная физическая активность повышают силу, выносливость и улучшают повседневную жизнедеятельность. Интегрированные, мультидисциплинарные модели оказания медицинской помощи показали наибольший общий эффект, улучшая как качество жизни, так и результаты медицинского обслуживания, если они предоставляются скоординированно и с учетом интересов пациента.

Ключевые слова: *ХОБЛ, качество жизни, легочная реабилитация, самоуправление, психологические вмешательства, цифровое здравоохранение, тройная терапия, комплексная помощь.*

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Түйіндеме

СОӨА БАР НАУҚАСТАРДЫҢ ӨМІР САПАСЫ. ӘДЕБИЕТТІК ШОЛУ

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Кіріспе: Созылмалы обструктивті өкпе ауруы (СОӨА) – науқастың денсаулыққа байланысты өмір сапасын айтарлықтай төмендететін үдемелі респираторлық ауру. Өкпе қызметінің бұзылуымен қатар, СОӨА-мен ауыратын науқастардың күнделікті өміріне түрлі клиникалық, психологиялық және әлеуметтік факторлар әсер етеді. Соңғы онжылдықта зерттеулер СОӨА жағдайында өмір сапасына әсер ететін негізгі факторларды анықтауға көбірек көңіл бөлуде, өйткені өмір сапасын жақсарту осы ауруды емдеудің басты мақсаты ретінде қарастырылады. Бұл шолуда 2015–2025 жылдар аралығындағы дәлелді деректер негізінде СОӨА-мен ауыратын науқастардың өмір сапасына әсер ететін негізгі факторлар қарастырылады: аурудың ауырлығы, қатар жүретін аурулар, психологиялық жағдай, физикалық белсенділік, өршулердің жиілігі, әлеуметтік қолдау, медициналық көмекке қолжетімділік және емдеуге бейілділік. Әдебиеттегі ортақ тақырыптар мен олқылықтар айқындалып, соңында осы факторлардың ем нәтижелеріне қалай әсер ететіні және болашақ зерттеулердің бағыттары талқыланады.

Мақсаты: Бұл шолудың негізгі мақсаты – созылмалы обструктивті өкпе ауруымен (СОӨА) ауыратын науқастардың өмір сапасын жақсартуға бағытталған заманауи тәсілдерді жинақтап, талдау. Ерекше назар фармакологиялық терапияға, өкпелік оңалтуға, психоәлеуметтік араласуларға, телемедициналық шешімдерге, өзін-өзі басқаруды оқытуға, өмір салтын өзгертуге және кешенді күтім үлгілеріне аударылды.

Іздеу стратегиясы: Ғылыми әдебиеттерге шолу PubMed, Scopus және Кокрейн кітапханасы секілді электронды мәліметтер базасы арқылы жүргізілді. Іздеу 2015–2025 жылдар аралығында жарияланған зерттеулерді қамтыды және келесі негізгі сөздер пайдаланылды: "СОӨА", "өмір сапасы", "өкпелік оңалту", "өзін-өзі басқару", "психологиялық араласулар", "цифрлық денсаулық сақтау", "үштік терапия" және "кешенді көмек". Артықшылық жүйелі шолуларға, рандомизацияланған бақыланатын зерттеулерге және жоғары сапалы когорттық зерттеулерге берілді, олар ағылшын тіліндегі рецензияланған журналдарда жарияланған.

Нәтижелер мен қорытындылар: Соңғы зерттеулер көрсеткендей, түрлі заманауи араласулар СОӨА-мен ауыратын науқастардың өмір сапасын едәуір жақсарта алады. Фармакологиялық емдеу әдістерін оңтайландыру, әсіресе үштік ингаляциялық терапия, симптомдар мен өршулерді азайтады. Өкпелік оңалту физикалық функция мен әл-ауқатты тұрақты жақсартады. Когнитивті-бихевиоральдық терапияны қамтитын психологиялық қолдау мазасыздық пен депрессияны төмендетіп, эмоционалдық денсаулықты жақсартады.

Телемедицина мен мобильді құралдар пациенттердің өз-өзін басқаруын және медицина қызметкерлерімен өзара іс-әрекетін жақсартады, ал құрылымдалған білім беру бағдарламалары ауруды бақылауды жақсартып, ауруханаға жатқызу жиілігін төмендетеді. Тамақтануды қолдау және тұрақты физикалық белсенділік бұлшықет күшін, төзімділікті арттырып, күнделікті өмір сапасын жақсартады. Интеграцияланған, мультидисциплинарлық медициналық көмек үлгілері жалпы тиімділікке қол жеткізіп, өмір сапасы мен медициналық қызмет нәтижелерін жақсартады, егер олар үйлестіріліп және пациенттің мүддесін ескере отырып ұсынылса.

Кілт сөздер: *СОӨА, өмір сапасы, өкпелік оңалту, өзін-өзі басқару, психологиялық араласулар, цифрлық денсаулық сақтау, үштік терапия, кешенді көмек.*

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Introduction

The quality of life (QoL) in patients with Chronic Obstructive Pulmonary Disease (COPD) is significantly impacted by various factors, including disease severity, comorbidities, and lifestyle habits. COPD is known to cause both physical and mental health challenges, leading to a compromised health-related quality of life (HRQOL) for patients. The presence of comorbid conditions such as hypertension, diabetes, and cardiovascular diseases further exacerbates the decline in QoL. This overview will delve into the specific factors affecting QoL in COPD patients.

Comorbidities like hypertension, diabetes, and hyperlipidemia are associated with a lower QoL in COPD patients. For instance, hypertension affects the "Activity" and "Impact on life" domains, while hyperlipidemia impacts the "Symptoms" and "Impact on life" subscales.

Comorbid conditions such as cardiovascular diseases and diabetes mellitus are significant contributors to the reduced QoL in COPD patients.

The severity of COPD, as classified by the Global Initiative for Obstructive Lung Disease (GOLD) staging, correlates with a decline in HRQOL. More severe stages of COPD result in higher symptom, activity, and impact scores, indicating a poorer QoL[21].

Age is another factor, with older patients experiencing a more significant decline in QoL, particularly in the functional and psychological domains.

Smoking, obesity, and exposure to air pollutants are lifestyle factors that negatively affect the QoL in COPD patients. These factors contribute to both physical and mental health deterioration.

Poor quality of sleep and the presence of comorbidities increase the risk of a poor QoL, with comorbidities posing a 2.716 times higher risk.

While the primary focus is on the negative impacts of COPD on QoL, it is essential to consider the potential for improvement through early diagnosis, lifestyle changes, and comprehensive management plans. Integrating pulmonary rehabilitation and addressing comorbid conditions can help mitigate the decline in QoL for COPD patients.

Objective. The primary objective of this review was to summarize and analyze modern approaches aimed at improving the quality of life in patients with chronic obstructive pulmonary disease (COPD). Specific focus was placed on pharmacological therapies, pulmonary rehabilitation, psychosocial interventions, telehealth, self-management education, lifestyle modifications, and integrated care models.

Search strategy. A narrative literature review was conducted using electronic databases including PubMed, Scopus, and Cochrane Library. The search included studies published from 2015 to 2025 using keywords such as: “COPD”, “quality of life”, “pulmonary rehabilitation”, “self-management”, “psychological interventions”, “digital health”, “triple therapy”, and “integrated care”. Preference was given to systematic reviews, randomized controlled trials, and high-quality cohort studies published in peer-reviewed journals in English.

Search results and their discussion.

Factors Affecting Quality of Life in COPD Patients

Objective markers of disease severity correlate with COPD patients’ quality of life. Patients with more severe airflow obstruction (lower FEV_1% predicted) generally report worse HRQoL [9]. Similarly, severe dyspnea is a key driver of poor QoL. *Rosińczuk J. et al.* (2018) found that greater dyspnea intensity was associated with significant deterioration in QoL scores [37]. In a cohort of severe COPD patients, dyspnea level (e.g. higher mMRC grade) emerged as an independent predictor of worse St. George’s Respiratory Questionnaire (SGRQ) scores [36]. These findings confirm that difficulty in breathing—central to COPD—strongly compromises daily functioning and well-being. Measures of functional exercise tolerance also relate closely to QoL. A reduced six-minute walk distance (6MWD) or other exercise capacity indices correspond to lower HRQoL [11]. For instance, *Esteban C. et al.* (2020) reported about a 5% QoL improvement per 25-meter increase in 6MWD over time [9], underscoring that patients who maintain better exercise capacity tend to have higher quality of life. Conversely, severe fatigue and exercise intolerance limit patients’ activities and social engagement, contributing to worse mental and physical health status. Longer duration of COPD has been linked to gradually declining QoL [38]. Patients in advanced stages who require long-term oxygen therapy experience particularly poor QoL. Dependence on supplemental oxygen is associated with markedly lower scores across QoL domains [38] reflecting the burden of advanced disease and mobility limitations.

Acute exacerbations of COPD (periods of worsened respiratory symptoms often requiring additional treatment or hospitalization) have a profound negative impact on quality of life. Frequent exacerbations accelerate lung function decline and introduce physical and emotional stressors that degrade patients’ health status. *Fazekas-Pongor V. et al.* (2021) identified frequent exacerbations as one of the most important factors adversely affecting HRQoL in COPD [11]. Patients with a history of repeated exacerbations report significantly worse QoL than those with infrequent or no exacerbations. Each hospitalization for a COPD exacerbation can lead to enduring declines in physical functioning and independence. In a 5-year longitudinal study, Esteban et al. (2020) found that the cumulative number of hospitalizations was among the strongest predictors of poorer HRQoL over time [9]. Exacerbations not only cause acute deterioration but also often have lasting effects – patients may develop heightened anxiety about breathing or activity, reduced confidence, and social withdrawal after a severe episode. Preventing exacerbations (through optimal therapy and self-management) is therefore critical not just for survival but for maintaining better QoL. Consistently, studies demonstrate that exacerbation frequency has a dose-dependent relationship with QoL impairment: fewer exacerbations equate to better preserved quality of life [9].

Most COPD patients, especially older adults, have one or more comorbid conditions – such as cardiovascular disease, metabolic syndrome, osteoporosis, diabetes, or others – which can compound the disease burden and impair quality of life. Multimorbidity in COPD is common and is linked to worse health status. *Rosińczuk J. et al.* (2018) observed that the presence of additional chronic illnesses was associated with significant QoL deterioration in COPD patients [38]. Similarly, a large cross-sectional study found that the number of comorbidities correlated negatively with

QoL: patients with several comorbid conditions had much poorer HRQoL than those with none or few [9]. Comorbid illnesses impose extra symptoms, disability, and treatment complexity that can aggravate the limitations imposed by COPD itself. Certain comorbidities appear especially impactful. Cardiovascular disease (e.g. chronic heart failure or ischemic heart disease) in a COPD patient is associated with more severe dyspnea and worse overall QoL [28]. For example, concurrent heart disease can worsen exercise capacity and fatigue, directly lowering physical health scores, and can also heighten anxiety about health. Musculoskeletal conditions like arthritis or osteoporosis may further limit mobility and physical activity, compounding COPD-related activity limitations. Depression and anxiety – discussed in the next section – are also frequent comorbidities that markedly worsen QoL. In some cases, clusters of comorbidities (for example, the coexistence of cardiovascular, metabolic, and musculoskeletal disorders) have an additive detrimental effect on quality of life beyond the impact of each condition alone. Notably, recent research emphasizes assessing and managing the overall comorbidity burden. Comprehensive indices (e.g. Charlson Comorbidity Index) or simple counts of comorbid diseases predict QoL and prognosis in COPD better than any single diagnosis [11].

Psychological comorbidities are highly prevalent in COPD and have a well-documented negative influence on patients’ quality of life. In particular, depression and anxiety affect a substantial subset of COPD patients (with prevalence estimates ranging from about 20% up to 50% in many studies) [45]. The presence of a depressive or anxiety disorder significantly amplifies the subjective burden of COPD – patients experience worse symptom distress, lower motivation, and poorer social well-being, all of which are reflected in lower HRQoL scores [44]. A recent meta-analysis confirmed that comorbid depression in COPD is associated with markedly worse quality of life (pooled correlation coefficient ~0.48 between depression scores and poorer HRQoL) [35]. Comorbid anxiety also shows a significant association with worse HRQoL (pooled r ~0.36), although the impact of depression tends to be even stronger [35]. In fact, depression can be one of the single strongest predictors of poor QoL in COPD. Jang et al. (2019) conducted a multicenter study of patients with severe COPD and found that, among various factors evaluated, the presence of clinical depression was the major determinant of both disease-specific and generic QoL measures [17]. In that study, depression status explained more variance in SGRQ scores than airflow limitation, dyspnea level, or even exacerbation frequency. This suggests that the emotional and psychological toll of COPD (helplessness, hopelessness, loss of interest, etc.) can overshadow even some physical aspects of the disease in terms of impact on daily life. Anxiety, likewise, contributes to worse patient-reported outcomes – for example, anxiety about breathing or fear of breathlessness may limit activity and social engagement, leading to a downward spiral in QoL.These psychological factors and COPD severity can also interact bidirectionally. Depression and anxiety not only worsen QoL directly, but they are linked to worse disease outcomes (higher exacerbation risk, hospitalizations, and even mortality), which in turn further impairs QoL. Patients with untreated depression may be less motivated to adhere to treatments or stay physically active, fueling clinical deterioration [4].

Physical activity level is a potent modulator of quality of life in COPD. Patients who maintain regular physical activity and avoid a sedentary lifestyle experience better functional status, fewer symptoms, and higher QoL, while physical inactivity has the opposite effect [15]. In a longitudinal study, *Esteban C. et al.* (2020) found that physical activity (PA) was among the variables with the strongest influence on HRQoL over a 5-year period, with higher activity levels associated with significantly better QoL scores [9]. Conversely, physical inactivity and prolonged sedentary time are well-known to worsen health outcomes in COPD, including HRQoL [15]. Patients who are chair-bound or rarely active tend to report more dyspnea and fatigue during daily tasks, lower mood, and a sense of social isolation, all contributing to poorer quality of life. Cross-sectional studies reinforce this link. For example, a recent analysis of a COPD cohort in Austria (the CLARA II study) reported that low self-reported physical activity was associated with worse respiratory symptoms, more depressive symptoms, and poorer QoL scores. The authors noted that physical activity could be a relevant predictor of exacerbation risk, QoL, and even depressive symptom burden in COPD patients. This aligns with earlier findings that patients with very limited activity have higher risk of hospitalizations and mortality. On the positive side, interventions that increase physical activity capacity – notably pulmonary rehabilitation programs involving exercise training – consistently improve QoL in COPD [16]. Even low-intensity daily activities like walking or gardening, if done regularly, can yield improvements in exercise tolerance and self-efficacy, translating into better HRQoL. It is important to note that physical inactivity may be both a cause and consequence of worse COPD. Patients with severe disease often reduce activity due to breathlessness, leading to deconditioning that further worsens symptoms. This vicious cycle underscores why breaking the sedentary pattern (through rehabilitation, support for home exercise, etc.) is crucial [50].

Psychosocial factors, particularly the presence or absence of social support, significantly affect how COPD patients cope with their illness and thus influence QoL. Support can come from family members, friends, caregivers, or patient support groups. A recent scoping review by Aravantinou-Karlatou A. et al. (2023) concluded that social support has a strong positive influence on patient-reported outcomes in COPD, including quality of life and emotional well-being [2]. Patients who report having adequate emotional and practical support tend to experience less stress and better mental health, buffering some of the negative impacts of COPD. In contrast, those with inadequate social/emotional support are at higher risk of depression and also show a decline in HRQoL over time. Simply put, patients who feel isolated or unsupported in dealing with their disease often have worse health status and lower life satisfaction. Specific aspects of social support have been studied. For instance, living with a spouse/partner or with family is generally associated with higher QoL than living alone for COPD patients. Caregivers can assist with daily activities, treatment management, and provide encouragement to stay active. One study found that COPD patients who had a dedicated caregiver (often a spouse) were far more likely to participate in pulmonary rehabilitation and other beneficial activities than those without a caregiver. This implies that the presence of someone to help and motivate the patient can directly translate into better engagement with care and thus better outcomes. Social support also extends to peer support groups and pulmonary rehabilitation programs where patients support each other – these have shown psychosocial benefits like reduced loneliness and anxiety [34]. Notably, a 2020 mixed-methods study in Thailand highlighted social support as the strongest predictor of HRQoL among COPD patients in that region. In their analysis, social support exceeded even clinical factors in explaining variance in QoL scores, underscoring how critical support networks are in chronic disease management. Adequate social support can help patients adhere to treatments, maintain physical activity, and manage stress. On the other hand, social isolation can create a vicious cycle of worsening mood, inactivity, and poor self-care. It is also linked with increased healthcare utilization; patients lacking support may delay seeking care or have difficulty navigating health services, leading to worse health episodes. In summary, consistent evidence indicates that strong social support correlates with better quality of life in COPD, whereas social isolation or low support correlates with worse outcomes [24].

Broader social determinants – such as socioeconomic status (SES), education level, and access to healthcare – also play a role in COPD patients' quality of life. Lower SES often correlates with worse COPD outcomes and by extension poorer HRQoL. Patients of lower socioeconomic means may have more exposure to risk factors (e.g. continued occupational smoke exposure), higher stress, and less access to optimal care, contributing to a heavier symptom burden and limitations. For example, Fazekas-Pongor V. et al. (2021) reported that current smoking and physical inactivity were significant negative predictors of HRQoL in COPD [11]; these lifestyle factors are often intertwined with socioeconomic context (smoking prevalence is higher in lower SES groups, and opportunities for exercise may be fewer). Educational attainment is another important factor: higher education was associated with better QoL in a Polish COPD cohort, whereas patients with less education had worse QoL. Education likely improves health literacy and self-management skills, enabling patients to better understand and adhere to treatments and maintain healthier behaviors. Limited access to healthcare resources can substantially impact quality of life. COPD patients who face barriers to care – such as long distances to clinics, lack of transportation, or financial constraints – may have uncontrolled symptoms and more frequent exacerbations. A rapid review by Shatto et al. (2024) found significant geographic and socioeconomic disparities in COPD outcomes: for instance, patients from more deprived areas had higher hospitalization rates and worse mortality [42].

Lower education level was associated with a higher risk of acute exacerbations in some studies [42], which, as noted, leads to QoL decline. These findings suggest that inequities in care access (like availability of primary care, pulmonary rehabilitation programs, or specialists) can translate into differences in patient quality of life. Indeed, roughly half of the studies in that review reported significant geographical variation in access to COPD care and related health outcomes. While direct research on "access to care vs. QoL" is somewhat limited, it stands to reason that patients who receive guideline-concordant care (pharmacotherapy, immunizations, rehab, follow-up) experience better symptom control and QoL than those who do not. Socioeconomic challenges can also influence treatment adherence and psychosocial stress. Financial difficulties may lead patients to skip medications or appointments, worsening disease control. Additionally, those in lower SES brackets might have poor housing (exacerbating respiratory symptoms) or lack social support [3].

Adherence to prescribed treatments (such as inhaled bronchodilators, inhaled corticosteroids, oxygen therapy, and other medications) is a crucial determinant of symptom control and quality of life in COPD. Poor medication adherence is unfortunately common in COPD and has been consistently linked to worse outcomes and lower QoL. Studies in the last decade show that roughly 40–50% of COPD patients do not take their medications as directed, due to factors ranging from forgetfulness and incorrect inhaler technique to side-effect concerns and cost [31]. Mohsen et al. (2019) reported that about 45% of patients in their sample were nonadherent to treatment, and these patients had significantly worse HRQoL than those who were adherent [31]. In that study, nonadherence was associated with higher symptom burden and more frequent hospital visits, which translated into poorer QoL scores. The relationship between adherence and QoL can be cyclical: patients who feel better and have higher QoL may be more motivated to adhere, whereas those who are depressed or experiencing side effects may be less adherent, leading to uncontrolled symptoms that further erode QoL [40]. Several patient-, disease-, and therapy-related factors affect both adherence and QoL. For example, complex regimens or inhalers that are difficult to use can lower adherence and thus worsen symptom control. Conversely, simplifying therapy and educating patients on proper inhaler technique can improve adherence and often yields improved HRQoL as a result of better disease management. There is evidence that interventions like adherence counseling, reminders, or personalized education can modestly improve medication adherence in COPD. When adherence improves, studies note reductions in exacerbation rates and hospitalizations, likely leading to better perceived health and QoL. Beyond medications, adherence extends to other aspects of self-management – such as following exercise recommendations, using supplemental oxygen as prescribed, avoiding risk factors, and attending pulmonary rehabilitation. Adherence to these non-pharmacologic therapies also influences QoL. For instance, patients who adhere to an at-home exercise regimen after rehab are more likely to sustain the fitness and QoL gains from rehabilitation, whereas those who do not may lose those benefits over time. Treatment adherence is thus an area of high importance: while strong evidence exists that nonadherence is linked to worse clinical outcomes and

QoL, achieving high adherence in real-world patients remains a challenge [54].

Quality of life in COPD is a multifactorial outcome shaped by the complex interaction of the factors described above. Importantly, these factors do not act in isolation; they often influence one another in positive or negative feedback loops. For example, a patient with severe airflow limitation and frequent exacerbations may develop depression due to loss of function, and that depression can in turn reduce the patient's motivation to stay active or adhere to therapy – leading to further clinical deterioration and even worse QoL. Similarly, low social support might worsen a patient's anxiety and self-management, resulting in more hospitalizations that then further diminish QoL [51]. By contrast, improving one domain can have spillover benefits: successful pulmonary rehabilitation can increase physical activity and exercise capacity, improve mood, and enhance self-efficacy in disease management, jointly lifting QoL. The evidence base over the last decade is strong for certain factors. Disease severity (lung function, dyspnea) and exacerbation frequency are consistently shown to be major determinants of HRQoL, supported by numerous longitudinal and cross-sectional studies. The impact of psychological comorbidities, particularly depression, is also well-established as a critical factor reducing QoL in COPD [25]. Physical inactivity and poor exercise tolerance are universally recognized as contributors to worse outcomes and QoL, lending support to interventions that target fitness. These areas represent strong evidence where clinicians can be confident that addressing the issue (e.g. treating depression or encouraging activity) is likely to improve patient quality of life. On the other hand, some domains have comparatively limited evidence or mixed findings. For instance, the role of socioeconomic status and health care access in QoL, while intuitively important, has been less directly studied – existing data suggest an influence, but more research is needed to quantify how improving access to care translates into QoL gains [8]. Social support, too, is clearly important, but interventions to enhance support (such as peer support programs or caregiver training) have not been extensively evaluated for QoL outcomes in COPD. Additionally, factors like cognitive impairment or frailty are emerging considerations that may affect QoL but remain under-researched in COPD populations. Inconsistent findings exist for demographic factors such as age and sex – some studies indicate older age is associated with worse QoL, while others find that older patients may report stable or even better mental QoL (perhaps due to adjusted expectations or better acceptance of illness). These variations highlight the need for more nuanced research into subgroup differences and the longitudinal trajectories of QoL as patients age with COPD [53].

Modern Approaches to Improving Quality of Life in COPD Patients

Optimized pharmacotherapy remains a cornerstone of improving COPD symptoms and quality of life. In the past ten years, combination inhalers have become standard for moderate-to-severe disease. Dual long-acting bronchodilator therapy (LABA/LAMA) provides greater bronchodilation, symptom relief, and modestly better health status compared to single bronchodilators. For patients with frequent exacerbations or severe symptoms, single-inhaler triple therapy (inhaled corticosteroid + LABA + LAMA) has emerged as an important advance. Clinical trials such as the IMPACT study showed that triple therapy significantly reduced exacerbation rates and led to small but significant improvements in St. George's Respiratory Questionnaire (SGRQ) scores [26]. A systematic review in 2021 confirmed that adding an ICS to LABA/LAMA (triple therapy) yields a greater improvement in SGRQ (mean ~1.7-point improvement versus dual therapy) along with improved lung function [22]. Although the average QoL gain from triple therapy is below the 4-point threshold for a clinically important difference, many patients experience better symptom control and fewer exacerbations, which cumulatively enhance daily well-being [22]. It is notable that triple therapy's benefits must be balanced against risks (e.g. pneumonia in ICS users), so current guidelines recommend it for patients with persistent symptoms or exacerbations despite dual therapy. Beyond inhalers, other pharmacologic approaches contribute to quality of life improvements in select cases. Phosphodiesterase-4 inhibitors (e.g. roflumilast) and long-term macrolide antibiotics have been used in patients with chronic bronchitic phenotypes or frequent exacerbations; these interventions primarily reduce exacerbation frequency, which can secondarily improve HRQoL by preventing illness episodes [12]. While their direct impact on QoL scores is modest, they address factors (exacerbations, bronchitis symptoms) that otherwise degrade quality of life. More recently, there is exploration of biologic therapies (e.g. anti-IL5 or anti-IL33 antibodies) in COPD, but to date trials have not shown clear improvements in exacerbation rates or QoL for most patients. Overall, the optimization of inhaled therapy (with newer devices and combinations) has been the most impactful pharmacologic development in the past decade for QoL – improving daily symptom burden, exercise tolerance, and reducing flare-ups that disrupt patients' lives [26].

Pulmonary rehabilitation (PR) is a comprehensive intervention (typically exercise training plus education and counseling) that has longstanding evidence for improving COPD outcomes. In the last ten years, further evidence has solidified PR's role in enhancing quality of life. A 2015 Cochrane review of 65 trials found that rehabilitation leads to clinically significant gains in disease-specific QoL measures and exercise capacity compared to usual care [29]. Patients in PR achieved greater improvements than the minimum clinically important difference on instruments like the Chronic Respiratory Questionnaire, across domains of dyspnea, fatigue, emotional function and mastery [29]. These benefits translate into patients feeling less breathless in daily activities, more energetic, and more confident in managing their disease – all key components of improved life quality. Notably, the Cochrane analysis concluded that further trials versus true usual care were unnecessary, given the unequivocal benefit of PR on HRQoL and functional exercise tolerance [29]. Recent work has focused on expanding access and sustaining PR benefits over time. Home-based and community-based pulmonary rehabilitation programs have been developed as alternatives to traditional center-based classes. Studies suggest that properly structured home-based PR can yield comparable short-term improvements in exercise endurance and QoL as outpatient programs, which is promising for patients facing travel or mobility barriers [30]. However, maintaining the gains of PR long-term remains challenging. Follow-up studies show that without ongoing maintenance, improvements in 6-minute walk distance and symptom scores can diminish after 6–12 months. Efforts such as low-frequency maintenance exercise sessions or tele-rehabilitation are being tested to prolong PR's positive impact. Nonetheless, pulmonary rehabilitation is established as one of the most effective non-pharmacologic therapies to improve quality of life in COPD, yielding better exercise capacity, reduced dyspnea, and enhanced daily functioning [29].

Addressing the psychological burden of COPD has become increasingly recognized as essential for quality of life improvement. Many COPD patients suffer from depression, anxiety, panic related to breathlessness, and social isolation, which can all worsen perceived health status. In the past decade, studies of psychosocial and behavioral interventions have shown meaningful benefits. A comprehensive meta-analysis by *Farver-Vestergaard I. et al.* (2015) found that psychologically-based interventions (such as cognitive-behavioral therapy, anxiety management training, or supportive counseling) significantly reduced symptoms of anxiety and depression and led to improvements in COPD patients' quality of life [10]. The interventions in these studies ranged from brief education plus relaxation training to multi-session CBT programs, delivered individually or in groups. Overall, patients receiving structured psychological support had better HRQoL and emotional well-being than control groups, with effects beyond those achieved by standard pulmonary rehab alone [10]. This underscores that treating the mind-body interaction in COPD – alleviating fear, stress, and mood disturbance – translates into better daily functioning and coping. Specific behavioral strategies have been tested with positive results. Cognitive-behavioral therapy (CBT) tailored for COPD-related anxiety can reduce catastrophic thinking about breathing and improve self-management of panic symptoms. For instance, a randomized trial reported that a brief CBT program delivered by respiratory therapists not only lessened anxiety levels but also reduced urgent healthcare use, suggesting patients felt more in control. Patients who learn coping skills for breathlessness and anxiety tend to regain confidence in exerting themselves, thereby becoming more active and improving their life quality. Additionally, novel approaches such as group singing therapy have shown psychological and QoL benefits. In a community trial, COPD patients who participated in weekly group singing for 3–6 months had significantly reduced depression scores and better disease-specific quality of life (measured by the COPD Clinical Questionnaire) compared to controls [27]. Participating in singing (a form of musical therapy) likely provided both respiratory exercise and social interaction, highlighting the value of creative, enjoyable activities to improve mood and social well-being in COPD. Behavioral interventions like smoking cessation support, breathing techniques (e.g. pursed-lip breathing training), and energy conservation strategies also play a role. Smoking cessation is fundamental to slowing disease progression; quitting smoking can lead to improved cough and sputum symptoms over time and prevents further decline in exercise capacity, thereby contributing to better HRQoL long-term [7]. Meanwhile, training in breathing and pacing techniques helps patients manage dyspnea during activities, reducing fear of breathlessness and fostering independence. In summary, interventions targeting the psychological and behavioral dimensions of COPD – from formal therapy to support groups and relaxation techniques – have proven to enhance quality of life by improving mental health, self-efficacy, and coping. Incorporating psychological care into routine COPD management is a modern paradigm for holistic improvement of patient well-being [10].

Digital health innovations and telemedicine have expanded rapidly, especially in recent years, offering new ways to support COPD patients and potentially improve their quality of life. Telehealth interventions range from remote monitoring of symptoms and telecoaching, to videoconference pulmonary rehabilitation and smartphone applications for self-management. Evidence from the past decade indicates that these technologies can yield meaningful benefits [20]. For example, a 2024 network meta-analysis by Chang et al. compared various eHealth interventions and found that web-based programs and mobile apps significantly improved health-related quality of life in COPD patients (measured by validated questionnaires), relative to usual care [5]. Among different modalities, web-based interventions were identified as the most effective in enhancing QoL, while telemonitoring was most effective for improving exercise endurance. These findings suggest that giving patients interactive online tools – such as web portals with educational content, symptom tracking, and feedback – empowers them to better manage their condition, leading to improved daily health status. Several studies have shown specific outcomes from telehealth programs. Remote patient monitoring systems, where patients regularly upload spirometry readings or report symptoms via phone/app, can enable early intervention for exacerbations and personalized coaching [1]. Meta-analyses of telemonitoring report modest improvements in QoL scores and reductions in hospital admissions. Telehealth interventions often incorporate tele-consultations or telecoaching: nurses or respiratory therapists providing scheduled phone or video support. This ongoing support improves patients' confidence in self-care and adherence to treatments, translating into better HRQo. During the COVID-19 pandemic, telehealth pulmonary rehabilitation (home exercise training supervised by video call) became more common; studies found that tele-rehab can produce similar improvements in exercise capacity and QoL as center-based PR, broadening access to this vital service. Digital tools also include smartphone applications that guide inhaler use, remind patients to exercise or take medications, and educate patients with interactive content [19]. Many COPD apps now incorporate symptom diaries and action plan prompts. A common observation is that patients using such digital self-management tools report feeling more in control and less anxious about their disease, which in turn improves their perceived quality of life. Of course, the success of telehealth depends on patient engagement and the usability of technology, but when implemented well, telehealth programs can reduce isolation, improve disease monitoring, and enhance access to care – all contributing to improved QoL [5].

Encouraging effective self-management through education and coaching has been a major focus of modern COPD care. Structured self-management programs aim to teach patients skills to manage symptoms, adhere to therapy, recognize early signs of exacerbation, and adopt healthy behaviors. In the last decade, strong evidence has accumulated that well-designed self-management interventions can improve health status and reduce hospitalizations [48]. A 2022 Cochrane review (updating prior analyses) included over 6000 COPD patients and found that self-management interventions likely improve health-related quality of life as measured by the SGRQ, with an average improvement of about 2.9 points versus usual care. Although this mean improvement did not quite reach the 4-point MCID, some trials did achieve clinically meaningful benefits, and importantly, the interventions significantly reduced the risk of respiratory-related hospital admissions (by about 25%) [41]. Fewer exacerbation hospitalizations directly correlates with better QoL, as patients avoid the physical and psychological stress of acute illness episodes. Key components of successful self-management programs include: individualized action plans for exacerbations (with instructions on medication adjustment and when to seek care), inhaler technique training, education about the disease and treatments, coping strategies for dyspnea, and regular follow-up to reinforce skills. Programs often involve multi-disciplinary input (nurses, respiratory therapists, pharmacists) and behavioral techniques to enhance adherence. Patients who are actively engaged in self-management gain a sense of autonomy and mastery over their condition, which improves their confidence and mental well-being. They also tend to have better medication adherence and make appropriate use of health resources, preventing crises [47]. The evidence supports that COPD self-management education improves multiple domains of quality of life – from physical aspects (exercise tolerance, symptom control) to emotional aspects (reducing anxiety about exacerbations). For example, patients frequently report that knowing how to respond early to symptom worsening reduces their fear and improves their day-to-day security. One notable finding is that self-management interventions are generally safe and not associated with increased mortality or adverse outcomes [41].

Given the systemic effects of COPD, attention to nutrition and lifestyle factors has become an important part of improving patient well-being. Many COPD patients, especially those with advanced disease, experience weight loss and skeletal muscle dysfunction (cachexia) which worsen exercise tolerance and HRQoL. Conversely, others may be overweight or have poor dietary quality, contributing to cardiovascular risk and dyspnea. Nutritional interventions in COPD focus on correcting malnutrition, optimizing body composition, and ensuring adequate energy for daily activity [32]. Recent studies have demonstrated that targeted nutritional support can yield benefits in functional status and quality of life. For example, a 2025 clinical study by Zhang et al. evaluated individualized nutrition management in COPD patients and found significant improvements in nutritional status, exercise capacity (6-minute walk test distance), and quality of life scores (CAT questionnaire) compared to standard diet advice. The group receiving personalized nutrition plans (with dietitian counseling and oral nutritional supplements when needed) had greater gains in weight and muscle strength, which translated into higher QoL scores and better pulmonary function than controls [52]. This aligns with earlier evidence that oral nutritional supplementation in underweight COPD patients can improve body weight, respiratory muscle strength, exercise tolerance, and HRQoL [6]. Gaining even a few kilograms of lean mass can help patients breathe and move more easily, directly enhancing daily life. Beyond addressing undernutrition, dietary quality and specific nutrients have been investigated for COPD benefits. Trials of high-protein diets, omega-3 fatty acid supplements, and vitamin D repletion have suggested improvements in muscle function and reductions in inflammation, which may positively affect QoL, though results are mixed [39]. One consistent finding is that malnutrition is associated with worse quality of life and higher mortality in COPD, so proactive nutritional support is recommended for patients with low BMI or unintentional weight loss. Equally, obese COPD patients may benefit from weight reduction combined with exercise, as excessive weight can worsen dyspnea and activity tolerance. Nutritional counseling therefore must be individualized. Lifestyle modifications also encompass exercise and physical activity outside of formal rehab. Regular physical activity is strongly correlated with better health status in COPD [14]. Patients who remain active (e.g. walking daily) tend to have less dyspnea and higher QoL, whereas a sedentary lifestyle leads to deconditioning and poorer outcomes. Programs that encourage daily walking or provide activity coaching (sometimes with step counters or fitness trackers) have shown increases in exercise endurance and modest QoL improvements. Even low-intensity activities, if done consistently, can interrupt the cycle of inactivity and breathlessness. Smoking cessation is another critical lifestyle change – while quitting smoking may not immediately improve lung function, it slows further decline and often improves coughing and sputum production within months, which patients perceive as a better quality of life [49]. Additionally, avoiding airborne irritants, using energy conservation techniques at home, and practicing breathing exercises are lifestyle adjustments that help patients carry out daily tasks more comfortably. In sum, paying attention to nutrition and lifestyle factors addresses the extrapulmonary contributors to poor QoL in COPD. By optimizing body composition, encouraging physical activity, and eliminating harmful habits, patients can achieve improvements in strength, endurance, and overall vitality [52].

Modern COPD management recognizes that a multidisciplinary, integrated care approach is necessary to tackle the diverse needs of patients and improve their quality of life. Integrated care models typically involve coordinated input from pulmonologists, primary care providers, nurses, respiratory therapists, physiotherapists, pharmacists, and sometimes palliative care or social services, all working together to implement a comprehensive care plan. Over the last decade, clinical trials and meta-analyses have shown that integrated disease management (IDM) programs can lead to better outcomes than fragmented care [18]. A Cochrane review updated in 2021 (52 trials,>20,000 patients) concluded that integrated care programs probably improve health-related QoL (measured by SGRQ) in COPD, with a medium-term improvement of about 3.9 points versus usual care. Although this average improvement was just shy of the MCID, some programs achieved >4-point gains, and importantly IDM also produced significant reductions in hospital admissions and days in hospital [33]. These findings reinforce that when care is structured and proactive – rather than reactive – patients stay more stable and feel better in their daily lives [23]. Key elements of effective integrated care include: regular follow-up (often with case-manager nurses), personalized care plans, patient education and self-management support (as discussed earlier), optimization of pharmacotherapy, routine monitoring of symptoms and complications, and facilitation of access to pulmonary rehab, smoking cessation, or specialist referrals as needed [46]. For example, one primary care-based IDM program provided COPD patients with ongoing self-management coaching and scheduled telephonic check-ins; over 12 months it resulted in substantially improved COPD knowledge, fewer severe exacerbations, and better CAT quality-of-life scores compared to usual care. Patients in the integrated program were more likely to receive guideline-based interventions (vaccinations, rehab, etc.), which translated into improved QoL and functional status [13]. Another study targeting high-risk COPD patients in primary care found that an IDM intervention with case management led to a ~1.3 point improvement in CAT score and nearly 50% fewer severe exacerbations than controls – indicating a large impact on patients' well-being and stability. Crucially, integrated care often extends beyond medical management to address social and emotional needs – for instance, coordinating pulmonary rehabilitation, depression screening and treatment, nutritional advice, and even home care services. This holistic approach can reduce stress on patients and caregivers, thereby improving quality of life. Many severe COPD patients also benefit from early palliative care integration, focusing on symptom relief (breathlessness, anxiety, insomnia) and advance care planning, which has been shown to enhance QoL and satisfaction in advanced disease [43]. While more research continues on the optimal design of integrated care (e.g. which combination of components yields the greatest benefit), current evidence supports that multidisciplinary management improves patient-centered outcomes [33].

Conclusion

In the past decade, a multitude of strategies have evolved to improve the quality of life of patients living with COPD. Modern pharmacological treatments – especially the use of dual and triple inhaled therapy – have enhanced symptom control and reduced exacerbations, contributing to better daily functioning. Non-pharmacologic interventions are equally vital: pulmonary rehabilitation remains a gold-standard therapy for boosting exercise capacity and HRQoL, and it is now complemented by home-based and tele-rehab options. Addressing psychological and behavioral health needs has moved to the forefront, with evidence-based interventions like cognitive-behavioral therapy, support groups, and relaxation techniques mitigating the anxiety and depression that often accompany COPD and thereby improving overall well-being.

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