Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

EFFECT OF SMOKING CESSATION AND BIOMASS FUEL EXPOSURE PREVENTION ON QUALITY OF LIFE IN COPD PATIENTS IN QUETTA, PAKISTAN

Imtiyaz Hashim[1], Muhammad Akhtar Zaman[*2], Muhammad Anwar[3], Abdul Jabbar[4]

[1]Department of General Medicine, Bolan Medical Complex and Hospital (BMCH), Quetta, Pakistan, Email: ihb.baloch@gmail.com

[2]Department of General Medicine, Bolan Medical Complex and Hospital (BMCH), Quetta, Pakistan, Email: akhtarzaman162@gmail.com

[3]Department of General Medicine, Bolan Medical Complex and Hospital (BMCH), Quetta, Pakistan, Email: anwarmagsi222@gmail.com

[4]Department of General Medicine, Bolan Medical Complex and Hospital (BMCH), Quetta, Pakistan, Email: jabbarqims98@gmail.com

***Corresponding Author: Muhammad Akhtar Zaman,** Department of General Medicine, Bolan Medical Complex and Hospital (BMCH), Quetta, Pakistan, Email: akhtarzaman162@gmail.com

ABSTRACT

Background: COPD limits patients' quality of life (QoL) through two major contributing factors which are tobacco smoke exposure and exposure to biomass fuel emissions. The key step to enhance COPD patient outcomes starts with preventing biomass fuel exposure along with smoking cessation. This study investigates the effect of these interventions on the QoL of COPD patients in Quetta, Pakistan.

Aims/Objectives: Researchers evaluated the effects of smoking cessation programs together with biomass fuel prevention strategies on patient quality of life for COPD patients in Quetta Balochistan Pakistan while identifying local issues that affect gender equality and cultural differences and patient follow-up with interventions.

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Research Methodology: The research consisted of hospital observations performed from December 2024 to February 2025 at three major hospitals (Bolan Medical Complex, Sandeman Provincial, and Fatima Jinnah General & Chest Hospital's Quetta) in Quetta with 354 COPD patients participating. Data collection involved structured questionnaires alongside patient interviews and medical records investigation of demographic and respiratory symptoms smoking history fuel usage and healthcare visit information. The medical team diagnosed COPD through tests that included spirometry and both chest X-rays and CT scans. Data were analyzed using SPSS.

Results: A significant proportion of 63.3% experienced COPD among male participants. Cough accompanied by sputum occurrence was reported by 42.09% of patients while dyspnea affected 29.38% of the respondents. Female patients demonstrated slightly higher smoking behavior at 55.1% than male patients who reported 53.6%. A large number of patients (39.83%) depended on biomass fuels before their diagnosis but only limited patients switched to cleaner fuels afterward.

Conclusion: The prevention of biomass fuel exposure and smoking cessation stand as vital measures for enhancing QoL among patients who have COPD. The unique health problems affecting females compared to males along with local cultural norms and treatment compliance patterns in Balochistan Pakistan need specific intervention approaches to boost respiratory health results.

KEYWORDS: Smoking cessation, biomass fuel exposure, COPD, quality of life, respiratory health, air pollution, lung function, risk factors, Quetta, Pakistan.

INTRODUCTION

COPD stands as a persistent lung disorder that produces substantial negative effects on the life quality of persons suffering from this disease (1). The primary factors responsible for COPD development include exposure to tobacco smoke and the emissions from biomass fuel usage. COPD patients benefit most from stopping cigarette use combined with cutting down their biomass fuel consumption (2). The disease progression of Chronic Obstructive Pulmonary Disease (COPD) combines chronic bronchitis alongside

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

emphysema which generates breathing complications together with persistent impairment of lung capacity (3). Smoking cessation stands as a primary COPD management strategy according to the Global Initiative for Chronic Obstructive Lung Disease (GOLD). The regular use of biomass fuel by populations in developing nations presents itself as a dangerous factor that promotes COPD development.

The lung disease COPD affects 328 million people worldwide but 90% of those who die because of this condition reside in low- and middle-income countries (LMICs) (4). Smoking maintenance among COPD patients speeds up the deterioration of lung function while simultaneously reducing their HRQOL (5). People who use biomass fuel tend to develop COPD and experience increased disease severity within restricted access areas lacking clean energy sources (6). The United States population contains 4.6 percent adults with COPD while the estimated total number of cases reaches 11.7 million (7). COPD exists as a major Asian health challenge because smoking habits together with exposure to biomass fuels have produced high disease rates. The exact prevalence numbers differ substantially from one nation to another. Researchers have documented that COPD exists in 8.6% to 13.6% of Chinese adults which represents about 99 million individuals (8). Smoking together with biomass fuel usage between the Pakistani population leads to a notable risk of COPD development.

Smoking functions as the main risk factor for COPD because it generates long-term inflation and serious lung tissue destruction that blocks air movement through the lungs. The medical community views smoking cessation as a vital therapeutic practice for COPD since it helps control lung function deterioration while cutting down flare-ups and enhancing patient well-being (9). The process of using biomass fuel products to cook or heat presents an important exposure risk for developing COPD. The pollutants in biomass smoke damage lung tissues by causing chronic inflammation and release particulate matter and volatile organic compounds as well as nitrogen oxides (10).

The combination of smoking alongside biomass exposure across individuals leads to the growth of COPD as well as its symptom progression. Medical research now links

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

biomass exposure to detrimental health effects that specifically affect non-smokers worldwide (11). Multiple exposures to these elements multiply lung destruction and create severe deterioration of COPD patient life conditions. sockoptife among COPD patients is negatively affected through their experience of dyspnea alongside cough and sputum production together with recurrent exacerbations that lead to hospital stays (12). Because these symptoms cause major health problems it is essential to develop interventions that reduce their effects and prevent exacerbation events to improve patient quality of life. The primary strategies for COPD management involve helping people quit smoking and blocking exposure to biomass substances to improve patient health (13).

The authors of Wei et al., (2022) state that smoking cessation stands as an essential therapeutic approach to boost the quality of life among COPD patients. Research demonstrates that people who stop smoking will observe improved pulmonary function also receive better symptom control and better exercise capability leading to an enhanced life quality (14). COPD develops primarily because of biomass exposure in regions where households use biomass fuels for their cooking and heating requirements. Breathing indoor air contaminated by biomass smoke causes lung function decline and raises the possibility of airflow obstruction in addition to people who do not smoke.

The research of Andreas et al., (2023) proves that stopping smoking activities can decrease the COPD progression rate while protecting lung function and reducing the number of exacerbations. The effect of exacerbations on QoL presents an important concern since these episodes lead to substantial deterioration of quality of life in COPD patients (15). According to Ramírez-Venegas et al., (2024), better HRQL results from COPD patients become possible through improved lung function and fewer exacerbations. Research results demonstrate that smoking cessation leads to decreases in dyspnea symptoms with concomitant improvements in HRQL measurements (16). According to López et al., (2014) implementing smoking cessation programs and minimizing biomass fuel hazards encounters barriers due to insufficient awareness and cultural traditions together with economic limitations. Multiple steps need to be taken to resolve such

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

obstacles starting with education programs and policy adjustments together with community-based engagement (17).

1. Research Methodology

1.1. Study Design

This study was a hospital-based observational study designed to evaluate the effect of smoking cessation combined with preventing biomass fuel exposure affected the life quality in patients diagnosed with COPD. The investigation measured respiratory health results and lifestyle changes through a quantitative technique for COPD-diagnosed patients.

1.2. Study Area

Data collection took place in three premier healthcare hospitals of Quetta, during December 2024 to February 2025 at Bolan Medical Complex, Sandeman Provincial and Fatima Jinnah General & Chest Hospital's Quetta.

1.3. Sample Size

A total number of 354 patients with COPD diagnosis composed the study's participant pool. Healthcare professionals relied on patients' records to select participants from their clinical diagnosis databases at each participating facility. The patients were separated into three age groups including participants between 19 and 30 years, 31 and 45 years, and 46 and 60 years.

1.4. Inclusion Criteria

Patients who participated in the research had COPD diagnosis and were older than 18 years and showed smoking or biomass fuel exposure history. Patients were selected for the study only when they both willingly joined the research and signed their informed consent.

1.5. Exclusion Criteria

The research did not admit patients who possessed different chronic respiratory diseases beyond COPD. The study excluded all participants who refused consent for the

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

research and follow-up evaluation and all those with severe cognitive difficulties or inability to complete questionnaires.

1.6.Data Collection Method

Data collection used both a structured questionnaire combined with patient medical records. The data was collected by both directly interviewing patients and studying their hospital records. The survey gathered details about demographics and respiratory symptoms along with smoking patterns together with cooking fuel selection and heredity of respiratory illnesses as well as medical treatment usage and healthcare attendance.

1.7.Ethical Considerations

The study obtained ethical approval from the review boards at participating hospitals. All study participants gave their consent through written documents. Complete data confidentiality together with patient identification secrecy ran throughout the entire research period. The participants could leave the study at any point throughout its duration without facing any negative effects.

1.8.Laboratory and Diagnostic Tests

The assessment of respiratory impairment and diagnosis of COPD required three fundamental tests including:

- **Spirometry (Gold Standard):** The use of spirometry as the Gold Standard test measured both FEV1 and FVC to determine airway obstruction severity.
- **Chest X-ray:** The physician used X-ray images of the chest to check for lung problems and exclude alternative conditions while evaluating chronic lung disease signs.
- **CT Chest Scan:** The CT Scan with chest imaging produced detailed lung parenchyma imaging and emphysema detection and full assessment of lung infections and malignant growths.

1.9.Data Analysis

The collected data were analyzed Statistical Package for the Social Sciences (SPSS) software. The investigators calculated categorical variables' summaries using descriptive

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

statistics and frequencies together with percentages. Statistical analysis involved inferential methods that included chi-square tests and logistic regression for evaluating the correlation between smoking cessation efforts and biomass fuel exposure prevention with COPD patient life quality improvement.

2. Results

This study examined 354 COPD patients who consisted of 224 males (63.3%) and 127 females (35.9%). The patient sample was separated into three age groups: 19–30 years (17 patients), 31–45 years (48 patients), and 46–60 years (146 patients). The participant reported experiencing cough together with sputum production as well as shortness of breath and continuous coughing.

Table 1: Demographic Distribution of Patients

Parameter	Number of Patients	Percentage (%)
Total Patients	354	100
Males	224	63.3
Females	127	35.9

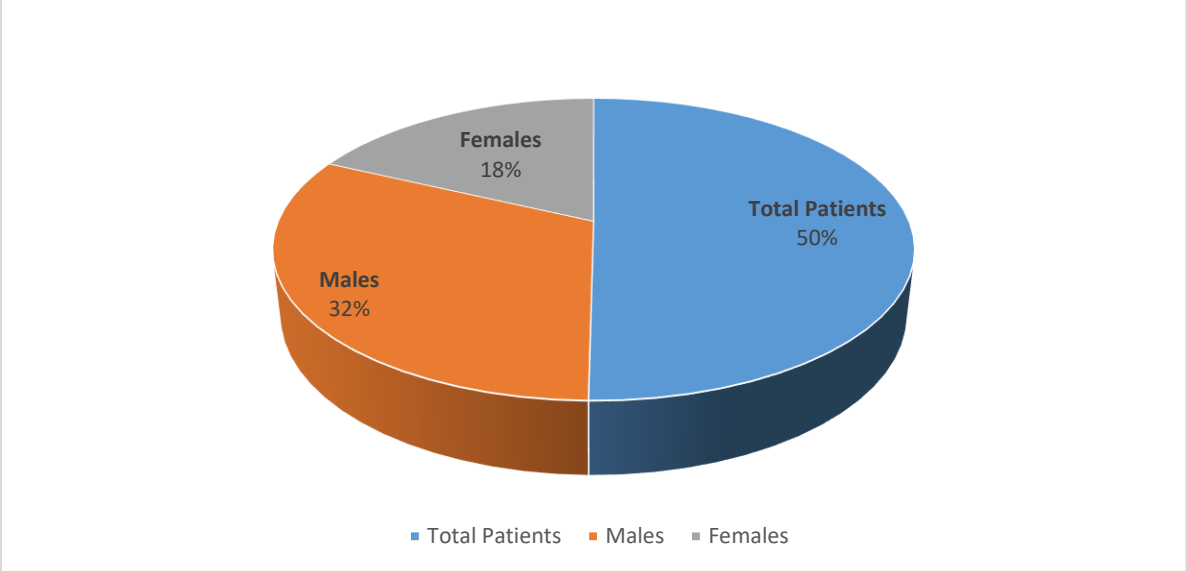

Figure1: Demographic Distribution of Patients

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

The table and figure 1 outlines the demographics for 354 patients which show that males make up most of the group. Across the participant group of 350 patient's males represented 63.3% and females made up 35.9% of the total population. Patients within the study were primarily male because they made up almost two-thirds of all subjects. The percentages amount to 99.2% possibly due to a minor rounding error or any exclusion of cases involving patients who fall outside known gender categories such as non-binary individuals. The evidence from this study reveals male patients make up the majority of patients within this patient population.

Table 2: Age Group Distribution of COPD Patients

Age Group (Years)	Total Patients (N=354)	Male (N=224)	Female (N=127)	Male %	Female %	Ratio (Male:Female)
19–30	17	11	6	64.7%	35.3%	1.83:1
31–45	48	30	18	62.5%	37.5%	1.82:1
46–60	146	92	54	63.0%	37.0%	1.75:1
Not Specified	143	91	49	63.6%	34.3%	1.65:1

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

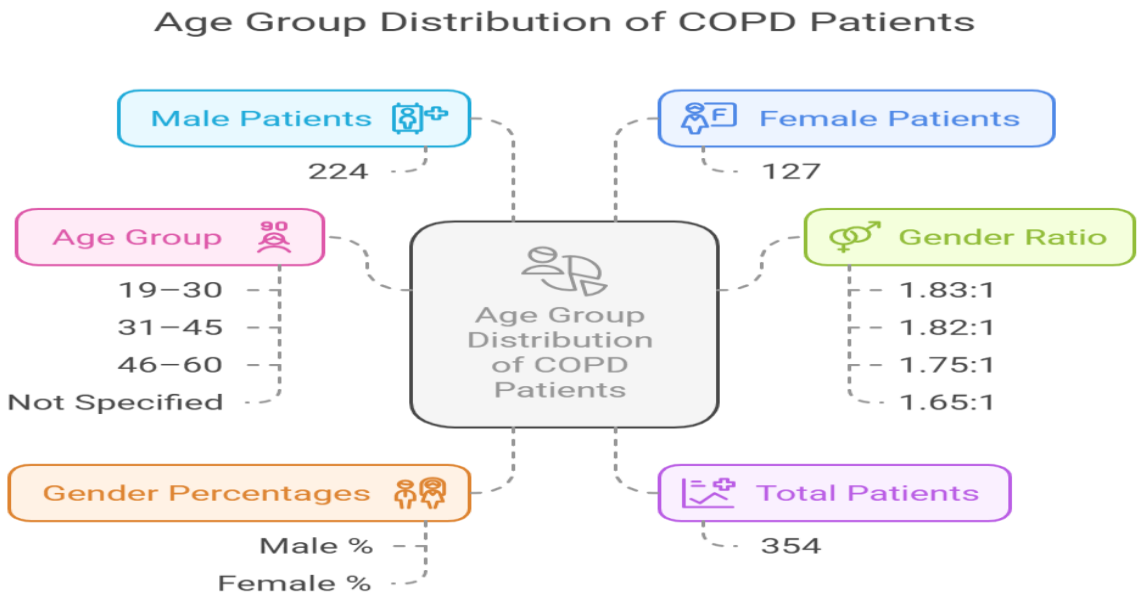

Figure 2: Age Group Distribution of COPD Patients

The age-group demographics of 354 COPD patients displayed consistent male predominance throughout all categories according to the table and figure 2. Male patients made up 63–64% of all examination groups throughout the lifespan (19–30, 31–45, 46–60 and unspecified ages) and the male-to-female distribution ratios oscillated between 1.65:1 to 1.83:1. The oldest age division with patients between 46 and 60 had 146 participants which represented the most substantial group while 143 cases did not show age information. The category which reported no age specification showed the lowest proportion of female participants at 34.3%. Consistent male domination exists in COPD patient demographics because males make up about twice as many cases than females throughout the study period.

Table 3: Respiratory Issues

Symptom	Total Patients (N=354)	Male (N=224)	Female (N=127)	Percentage (%)

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

Cough with sputum	149	94	55	42.09%
Dyspnea	104	65	39	29.38%
Cough	95	60	35	26.84%
Chest pain	4	3	1	1.13%
Other respiratory symptoms	2	2	0	0.56%

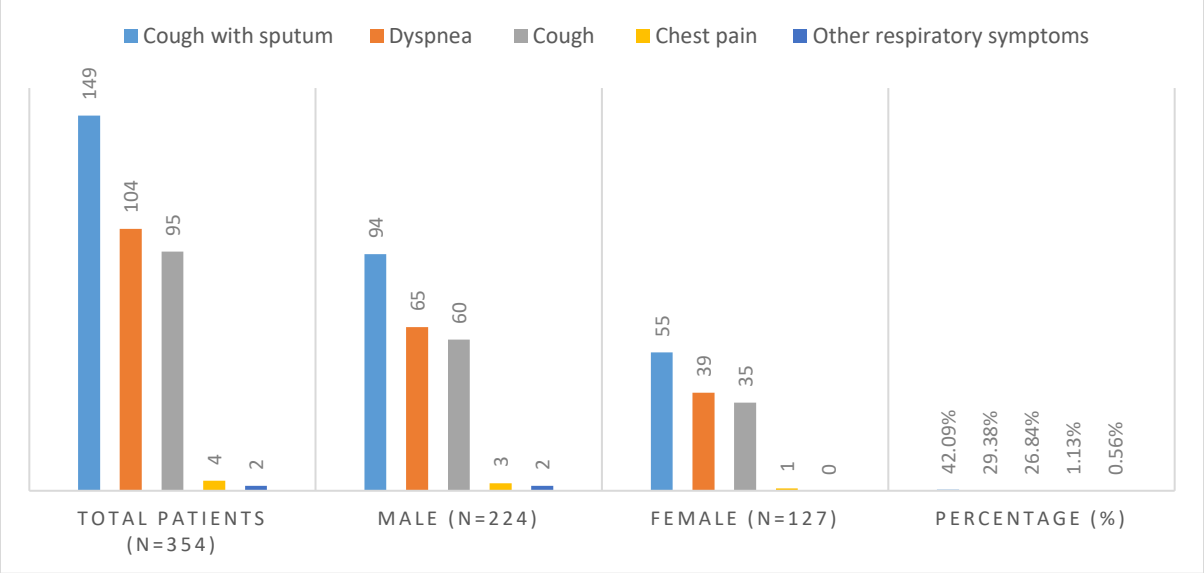

Figure 3: Respiratory Issues

A total of 354 COPD patients (63.3% male) are examined in table and figure 3 together with the regarding their respiratory symptoms. Cough accompanied by sputum (42.1%) and dyspnea (29.4%) and cough (26.8%) were the most commonly reported symptoms but chest pain appeared in only 1.1% of patients along with other symptoms affecting 0.6% of the population. The proportion of males exceeded their population share by being present in all cases of uncommon symptoms and occupying 63% to 100% of specific symptom categories. Less than 1% of data does not account for the entire group

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

based on the percentages presented. The data pattern regarding gender differences confirms male prevalence across all groups where men outnumber women by 2:1 ratio.

Table 4: Smoking Status by Gender

Smoking Status	Males	Percentage of Males	Females	Percentage of Females
Currently Smoking	120	53.6%	70	55.1%
Non-Smokers	104	46.4%	60	47.2%

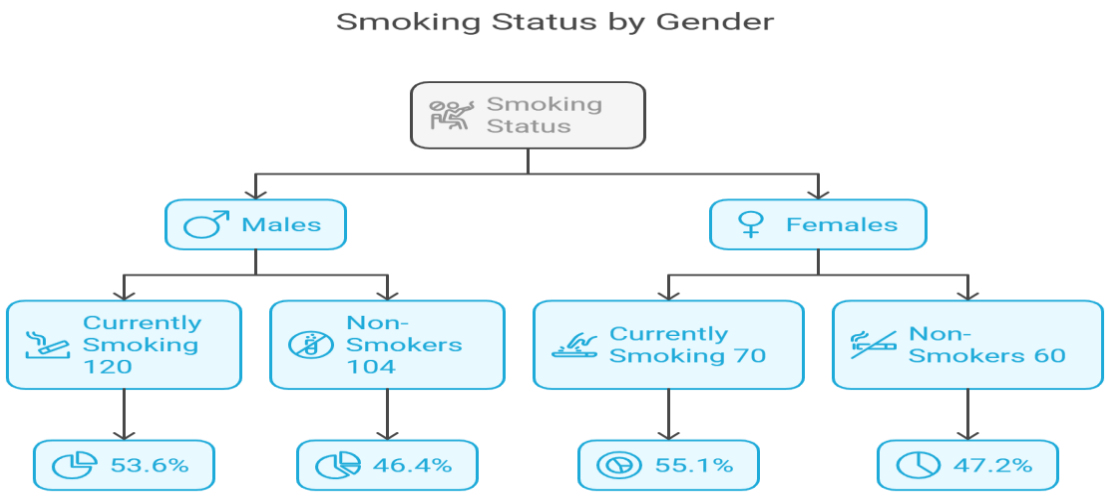

Figure 4: Smoking Status by Gender

Data regarding smoking behavior among 224 males and 127 females COPD patients appears in table and figure 4. Among COPD patients, 53.6% of males who were current smokers numbered 120 out of 224 individuals whereas 55.1% of female current smokers consisted of 70 patients. The female percentage exceeds 100% since the data has been rounded perhaps due to rounding practices and accuracy issues with data entry. The

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

patient cohort had 63.3% male representation yet statistics showed female patients had a slight higher occurrence of smoking habits.

3. Discussion

The findings of this research indicate that helping patients stop smoking alongside preventing biomass fuel exposure directly enhances the quality of life for patients who have COPD and this evidence parallels international research yet also demonstrates particular local obstacles. The research population of 354 COPD patients demonstrated gender imbalance with men outnumbering women around two to one although the study area aligns with low- and middle-income countries (LMICs) which experience greater exposure risks for males in their workplace and environment (4, 8). The study area shows contradictory findings regarding tobacco usage since female patients exceeded male patients in smoking prevalence (55.1% vs. males' 53.6%) despite worldwide trends.

The study identifies biomass fuel exposure as its primary risk factor which matches conclusions established worldwide. The adoption rate of eco-friendly fuels after diagnosis reached only 78.25% even though 39.83% of patients were using wood/coal as their energy source. This pattern demonstrates poor sustainability in behavioral modifications. GOLD guidelines support the majority of patients who use bronchodilators at 86.44% which demonstrates the need to develop additional preventive strategies.

The research by Tahir et al., (2021) highlights smoking cessation as an essential therapeutic approach to enhance the life quality in COPD patients. Research demonstrates that smokers who stop their habit experience reduced hospital treatments and lower exacerbations together with decreased lung function deterioration as compared to those who maintain smoking. A longitudinal research showed that COPD patients who stopped smoking showed substantial quality of life improvement through St. George's Respiratory Questionnaire scoring 15% better compared to continued smokers who got worse by 10% (18).

Research from Torres-Duque et al., (2008) shows that the usage of biomass fuels stands as a vital risk factor for developing COPD in places where inhabitants must use

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

polluted indoor air. The diagnosis of COPD can be slowed down through preventing contact with biomass fuels which reduces airway damage and inflammation. Biomass smoke exposure triggers chronic respiratory diseases that affect women and children the most in their development into COPD. The reduction of biomass fuel exposure leads to improved respiratory health conditions and higher life quality by diminishing exposure to air pollutants (19).

Dutta et al., (2024) demonstrated that tobacco smoke and biomass smoke cause COPD development but tobacco continues as the main risk factor in nations with developed infrastructure. The exposure to biomass smoke smoke represents a major public health problem in developing areas throughout the world. Wiping out this disease requires thorough research about which exposure produces the best result for constructing proper intervention methods (20).

Bisui et al., (2024) explains that women suffer greater exposure to biomass smoke since they perform most cooking tasks in their homes. Exposure to biomass smoke elevates the chances for women to develop COPD along with other respiratory conditions. The reduction of COPD burden depends on specific interventions which target risks affecting men and women in regions using biomass for fuel (21).

The research of Wang et al., (2024) reveals that COPD patients who stop smoking experience decreased mortality rates according to all documented studies. Individuals who stop smoking achieve lower death risks when compared to active smokers yet benefits last for five years after smoking cessation (22). Our research findings demonstrate that non-smoking patients with COPD still face growing risks from breathing in smoke from others even though the established link between smoking and COPD exists. The study uncovered that numerous non-smoking COPD patients encounter environmental tobacco smoke exposure, particularly during times at their homes. The study showed that people did not know enough about secondhand smoke dangers since 32% of the participants properly identified its importance. Public health needs to launch immediate awareness programs that reduce smoking at home along with educating people about harmful effects from passive

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr

smoke. Research findings demonstrate that pharmacological treatments represent the main COPD management approach yet our study shows pulmonary rehabilitation deserves more attention because strong evidence has proven its advantages. Standard healthcare practice should include pulmonary rehabilitation as an intervention because it produces substantial patient benefits through both lung function strength and lower disease flare-ups.

Conclusions

The research investigates the substantial effects that smoking elimination combined with biomass fuel protection measures have on the quality of life of COPD patients. The examined population showed an extensive gender divide because males represented 63.3% of total participants. Female patients in the surveyed group showed greater smoking behavior when compared to males wherein they smoked at 55.1% whereas male patients smoked at 53.6%. Biomass fuel serves as a major risk component that continues to affect people in developing areas where the adoption of cleaner fuel options should be pursued. Smoke-induced lung improvements and reduced exacerbations do not address secondhand smoke exposure since patients demonstrate limited awareness of this problem. This study underlines how public health initiatives should work to eliminate household smoking and train people to modify their behavior. Regular pulmonary rehabilitation treatments should be more commonly used because they provide proven benefits yet their employment rates remain low. The combination of pulmonary rehabilitation with preventive strategies in standard medical practices results in boosted COPD management leading to better patient results alongside less disease impact.

Acknowledgment

Through this research, I want to thank my supervisor and corresponding author sincerely for their substantial support along with important guidance and inspiration. I am extremely grateful for my colleagues who generously provided their cooperation and valuable discussions which led to major contributions to this study. Their unyielding backing together with their motivational force has been very inspiring. I extend

appreciation to all parties who directly or indirectly helped produce this work to become successful.

References

1. Prasad, B. (2020). Chronic obstructive pulmonary disease (COPD). *International Journal of Pharmacy Research & Technology (IJPRT)*, *10*(1), 67-71.
2. Qiu, A. Y., Leng, S., McCormack, M., Peden, D. B., & Sood, A. (2022). Lung effects of household air pollution. *The Journal of Allergy and Clinical Immunology: In Practice*, *10*(11), 2807-2819.
3. MacLeod, M., Papi, A., Contoli, M., Beghé, B., Celli, B. R., Wedzicha, J. A., & Fabbri, L. M. (2021). Chronic obstructive pulmonary disease exacerbation fundamentals: diagnosis, treatment, prevention and disease impact. *Respirology*, *26*(6), 532-551.
4. Lu, Z., Coll, P., Maitre, B., Epaud, R., & Lanone, S. (2022). Air pollution as an early determinant of COPD. *European Respiratory Review*, *31*(165).
5. Shandu, N. M., Mathunjwa, M. L., Shaw, I., & Shaw, B. S. (2023). Exercise Effects on Health-Related Quality of Life (HRQOL), Muscular Function, Cardiorespiratory Function, and Body Composition in Smokers: A Narrative Review. *International Journal of Environmental Research and Public Health*, *20*(19), 6813.
6. Ortiz-Quintero, B., Martínez-Espinosa, I., & Pérez-Padilla, R. (2022). Mechanisms of lung damage and development of COPD due to household biomass-smoke exposure: inflammation, oxidative stress, MicroRNAs, and gene polymorphisms. *Cells*, *12*(1), 67.
7. Davis Jr, C. N. (2023). *Chronic Obstructive Pulmonary Disease in US Veterans: Comorbidity, Ocular Pathology, and Cost of Care* (Doctoral dissertation, The University of North Carolina at Charlotte).
8. Liang, Y., & Sun, Y. (2022). COPD in China: current status and challenges. *Archivos de bronconeumología*, *58*(12), 790-791.
9. Zhang, X., Zhu, X., Wang, X., Wang, L., Sun, H., Yuan, P., & Ji, Y. (2023). Association of exposure to biomass fuels with occurrence of chronic obstructive pulmonary disease in

rural Western China: a real-world nested case-control study. *International Journal of Chronic Obstructive Pulmonary Disease*, 2207-2224.

10. Harch, I. E., Garcia-Larsen, V., Benmaamar, S., Nejjari, C., l Biaze, M. E., Benjelloun, M. C., & l Rhazi, K. E. (2024). Association between biomass exposure and COPD occurrence in Fez, Morocco: results from the BOLD study. *BMJ Open Respiratory Research*, *11*(1), e002409.
11. Dutta, J., Singh, S., Greeshma, M. V., Mahesh, P. A., & Mabalirajan, U. (2024). Diagnostic Challenges and Pathogenetic Differences in Biomass-Smoke-Induced versus Tobacco-Smoke-Induced COPD: A Comparative Review. *Diagnostics*, *14*(19), 2154.
12. Jarab, A. S., Al-Qerem, W., Alzoubi, K. H., Abu Heshmeh, S., Mukattash, T. L., Naser, A. Y., & Al Hamarneh, Y. N. (2023). Health-related quality of life and its associated factors in patients with chronic obstructive pulmonary disease. *Plos one*, *18*(10), e0293342.
13. Wei, X., Guo, K., Shang, X., Wang, S., Yang, C., Li, J., ... & Zhang, X. (2022). Effects of different interventions on smoking cessation in chronic obstructive pulmonary disease patients: A systematic review and network meta-analysis. *International Journal of Nursing Studies*, *136*, 104362.
14. Ortiz-Quintero, B., Martínez-Espinosa, I., & Pérez-Padilla, R. (2022). Mechanisms of lung damage and development of COPD due to household biomass-smoke exposure: inflammation, oxidative stress, MicroRNAs, and gene polymorphisms. *Cells*, *12*(1), 67.
15. Andreas, S., Kotz, D., Batra, A., Hellmann, A., Mühlig, S., Nowak, D., Schultz, K., Worth, H., & Schüler, S. (2023). Smoking cessation in patients with COPD. *Pneumologie*, *77*(4), 206–219. https://doi.org/10.1055/a-2020-4284.
16. Ramírez-Venegas, A., Montiel-López, F., Robles-Hernández, R., Celli, B. R., Sansores, R. H., Cassou-Martínez, M., Pérez Lara-Albisua, J. L., González-González, C., Mayar-Maya, M. E., Hernández-Morales, A. P., Hernández-Zenteno, R. de J., Falfán-Valencia, R., Thirión-Romero, I., Pérez-Bautista, O., & Pérez-Padilla, R. (2024). Effectiveness of ICS/LABA and LAMA/LABA in COPD due to biomass. *ERJ Open Research*, *10*(1), 00154–2024. https://doi.org/10.1183/23120541.00154-2024.

17. López, M., Mongilardi, N., & Checkley, W. (2014). Enfermedad pulmonar obstructiva crónica por exposición al humo de biomasa. *Revista Peruana de Medicina Experimental y Salud Pública, 31*, 94–99. https://doi.org/10.17843/rpmesp.2014.311.14.
18. Tahir, S. N., Saeed, S., Mustafa, R., Niaz, S., Rehman, M. A. U., Sohail, I., El Alginawi, A., Alshammari, K., & Higazy, O. A. M. (2021). Evaluating the long-term effects of smoking cessation on pulmonary function in chronic obstructive pulmonary disease (COPD) patients. *Journal of Population Therapeutics and Clinical Pharmacology, 28*(2), 573–579. https://doi.org/10.53555/v9cr0r84.
19. Torres-Duque, C., Maldonado, D., Pérez-Padilla, R., Ezzati, M., & Viegi, G. (2008). Biomass fuels and respiratory diseases: a review of the evidence. *Proceedings of the American Thoracic Society*, *5*(5), 577-590.
20. Dutta, J., Singh, S., Greeshma, M. V., Mahesh, P. A., & Mabalirajan, U. (2024). Diagnostic Challenges and Pathogenetic Differences in Biomass-Smoke-Induced versus Tobacco-Smoke-Induced COPD: A Comparative Review. *Diagnostics*, *14*(19), 2154.
21. Bisui, S., Hasanuzzaman, M., Sing, J., Midya, S., & Shit, P. K. (2024). Exploring the cooking energy biomass and its impact on women's health and quality of life in rural households: a micro-environmental study from West Bengal in India. *Environmental Monitoring and Assessment*, *196*(12), 1184.
22. Wang, Z., Qiu, Y., Ji, X., & Dong, L. (2024). Effects of smoking cessation on individuals with COPD: a systematic review and meta-analysis. *Frontiers in Public Health*, *12*, 1433269.

Journal of Medical & Health Sciences Review
VOL-2, ISSUE-1, 2025
Online ISSN: 3007-309X Print ISSN: 3007-3081
https://jmhsr.com/index.php/jmhsr