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Original Article

Profile of people registered in the Home Oxygen Therapy Program of Alfenas/Minas Gerais

Perfil de pessoas cadastradas no Programa de Oxigenoterapia Domiciliar de Alfenas/Minas Gerais

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ABSTRACT

Objective: To characterize the sociodemographic and clinical profile of individuals enrolled in the Home Oxygen Therapy Program in Alfenas, Minas Gerais. **Method:** This is a quantitative, descriptive, cross-sectional study conducted in the municipality of Alfenas, Minas Gerais. The sample consisted of 144 individuals registered in the Home Oxygen Therapy Program, residing in the urban area of the city, with no age restrictions. Data collection included sociodemographic, clinical, lifestyle, and behavioral characteristics, which were analyzed using descriptive statistics. **Result:** The majority of participants were female (61.8%), with a mean age of 69 years. More than half (54.2%) did not have caregivers, 64.6% did not engage in regular physical activity, 48.6% reported being non-smokers, and 63.9% denied alcohol consumption. The most prevalent diagnoses were Obstructive Sleep Apnea Syndrome (33.0%) and Chronic Obstructive Pulmonary Disease (28.6%), with Systemic Arterial Hypertension as the most common associated comorbidity (48.3%). Intermittent oxygen therapy was used by 86.1% of participants, with the nasal cannula and CPAP being the primary interfaces, each used by 39.6% of individuals. **Conclusion:** Although this study provides a local perspective, its findings contribute valuable insights for the care pathway of individuals requiring home ventilatory support in the state of Minas Gerais.

RESUMO

Objetivo: identificar o perfil sociodemográfico e clínico de pessoas cadastradas no Programa de Oxigenoterapia Domiciliar de Alfenas - Minas Gerais. **Método:** estudo quantitativo, descritivo e transversal realizado no município de Alfenas/Minas Gerais. A amostra foi composta por 144 pessoas cadastradas no Programa de Oxigenoterapia Domiciliar. Foram incluídas pessoas cadastradas no Programa de Oxigenoterapia Domiciliar, residentes na zona urbana do município, sem restrições etárias. Os dados coletados foram de caracterização sociodemográfica, clínica, hábitos e estilo de vida e analisados por meio da estatística descritiva simples. **Resultado:** a maioria dos participantes era do gênero feminino (61,8%), com a média de idade de 69 anos, não tinham cuidadores (54,2%), não praticavam atividades físicas regulares (64,6%), negavam tabagismo (48,6%) e etilismo (63,9%). Os diagnósticos mais predominantes foram Síndrome da Apneia Obstrutiva do Sono (33,0%) e Doença Pulmonar Obstrutiva Crônica (28,6%), com a comorbidade associada de Hipertensão Arterial Sistêmica (48,3%), 86,1% faziam uso de oxigenoterapia intermitente, tendo como interfaces principais o cateter e CPAP, com 39,6% cada um. **Conclusão:** embora se trate de um retrato local, ele apresenta resultados importantes para a linha de cuidado para pessoas com suporte ventilatório domiciliar no âmbito do estado de Minas Gerais.

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INTRODUCTION

Ventilatory support is essential for the treatment of individuals with respiratory failure, as it provides vital assistance in gas exchange through mechanical devices, which can be either invasive or non-invasive. This intervention is crucial in severe cases where compromised respiratory function requires immediate therapy to improve oxygenation and reduce the strain on respiratory muscles[1].

Individuals with chronic cardiopulmonary diseases, such as Chronic Obstructive Pulmonary Disease (COPD), often require ventilatory support for extended periods to maintain a better quality of life. This therapy is frequently administered in home settings, with the objective not only of improving respiratory efficiency but also of facilitating the performance of daily activities with less physical effort[2].

Home Oxygen Therapy Programs, subsidized by the Unified Health System (Sistema Único de Saúde - SUS), provide continuous support aimed at enhancing patients' quality of life and reducing complications associated with hypoxemia, a common condition in diseases such as COPD[3].

Nurses play a fundamental role in planning and implementing care, ensuring continuous monitoring, adjusting ventilatory parameters as needed, and assessing the clinical response to treatment. They also provide health education to patients, their families, and caregivers on the proper use of equipment, airway care, and recognizing warning signs[4,5].

Given that ventilatory support is a significant therapeutic resource provided by the SUS, identifying the profile of individuals enrolled in the Home Oxygen Therapy Program is essential for guiding the care provided by healthcare professionals, particularly nurses, and for assisting health managers in strategic planning, aiming to develop more effective measures[6,7].

Published studies detailing this profile in the specific regional setting of the present study remain scarce. In this context, the objective of this study was to identify the sociodemographic and clinical profile of individuals enrolled in the Home Oxygen Therapy Program in Alfenas, Minas Gerais (MG).

METHODS

Study type

This is a single-center, quantitative, descriptive, cross-sectional study.

Study site

The study was conducted in the municipality of Alfenas/MG as part of a Home Oxygen Therapy Program, which had 173 registered patients at the time of data collection. The program is managed by a multidisciplinary team composed of a pulmonologist, a nurse, and a social worker, who are responsible for the clinical and social follow-up of these patients.

Sample

The study employed a convenience sampling approach, including 173 individuals. Eligibility criteria included residing in the urban area of the municipality, with no age restrictions. Patients hospitalized during the data collection period were excluded.

Sample losses occurred due to the following reasons: 12 individuals resided in rural areas, seven were not found at home or refused to participate, two were hospitalized, two had outdated addresses and phone numbers, and six passed away during the study period, resulting in a final sample of 144 individuals.

Data collection form

Data were collected using a sociodemographic and clinical characterization form developed by the study authors, structured into three categories: sociodemographic data; lifestyle habits; and clinical profile. The form included information on gender, age, self-declared skin color, marital status, education level, occupation, personal income, religion, caregiver status, smoking habits, alcohol consumption, physical activity, medical diagnosis, comorbidities, mobility status, duration of oxygen use, intermittent or continuous use, oxygen source, and interface.

Data collection procedures

Data collection took place between January and May 2024. Initially, during a visit to the main office of the Home Oxygen Therapy Program, the addresses of registered patients were obtained based on medical records. Subsequently, home visits were conducted to collect data.

Participants were informed about the objectives of the study, and those who agreed to participate signed an informed consent form. For individuals unable to provide consent due to their medical condition, a family member or guardian was invited to participate in the study.

The researchers were responsible for reading and completing the data collection instrument, ensuring a comprehensive characterization by including information not present in the medical records. Data were obtained directly from registered individuals or, when necessary, from their family members or guardians.

Data analysis

The collected data were entered into a Microsoft Excel® spreadsheet and validated through double data entry to minimize errors. Descriptive statistical analysis was performed.

Ethical aspects

The study adhered to the ethical principles established by the National Health Council Resolution No. 466/2012[8] and was approved by the Research Ethics Committee under substantiated opinion No. 6.604.961 (CAAE 6472223.5.0000.5142).

RESULTS

Of the 144 participants, 89 (61.8%) were women, with a mean age of 69 ± 14.4 years. Regarding marital status, 63 (43.8%) were widowed. In terms of education, 41 (28.5%) had incomplete primary education, 94 (65.3%) were retired, 110 (76.4%) had a monthly income equivalent to one minimum wage, and 97 (67.4%) identified as Catholic (Table 1).

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Table 1 – Distribution of the sociodemographic characteristics of the study participants. Alfenas, Minas Gerais, Brazil, 2024 (N = 144).

Sociodemographic characteristics		n	%
Gender	Female	89	61.8
	Male	55	38.2
Age	10 to 21 years	1	0.7
	22 to 31 years	2	1.4
	32 to 41 years	2	1.4
	42 to 51 years	9	6.2
	52 to 61 years	30	20.8
	62 to 71 years	36	25.0
	72 to 81 years	41	28.5
	82 to 91 years	19	13.2
	92 to 101 years	4	2.8
Self-declared skin color	White	75	52.1
	Brown	39	27.1
	Black	30	20.8
Marital status	Married	59	41.0
	Separated	11	7.6
	Single	11	7.6
	Widowed	63	43.8
Education	Incomplete primary education	41	28.5
	Complete primary education	40	27.8
	Incomplete secondary education	5	3.5
	Complete secondary education	23	16.0
	Incomplete graduation	2	1.4
	Complete graduation	10	6.9
	Not attended	23	15.9
Occupation	Retired	94	65.3
	Temporary disability benefits	1	0.7
	Student	2	1.4
	Homemaker	11	7.6
	Pensioner	15	10.4
	Does not have an employment relationship	2	1.4
	Has an employment relationship	19	13.2
Personal income	One time the minimum wage	110	76.4
	Two times the minimum wage	16	11.1
	Three times the minimum wage	5	3.5
	Four or more times the minimum wage	2	1.4
	Does not have a fixed income	11	7.6
Religion	Catholic	97	67.4
	Spiritualist	11	7.6
	Evangelical	30	20.8
	Jehovah's Witness	5	3.5
	None	1	0.7

Regarding caregiver status, 78 (54.2%) did not have a family or professional caregiver. Among those with caregivers, 52 (36.1%) were assisted by a family caregiver, 13 (9.0%) by a professional caregiver, and only one (0.7%) had both.

Concerning lifestyle habits, 70 (48.6%) reported not smoking, 92 (63.9%) did not consume alcohol, and 93 (64.6%) did not engage in regular physical activity (Table 2).

In terms of clinical characteristics, 67 (33.0%) had a diagnosis of Obstructive Sleep Apnea Syndrome, 58 (28.6%) had COPD, 103 (71.5%) had comorbidities, and 107 (74.3%) were able to walk independently (Table 3).

Table 2 – Distribution according to the lifestyle habits of patients registered in the Home Oxygen Therapy Program. Alfenas, Minas Gerais, Brazil, 2024 (N = 144).

Lifestyle habits		n	%
Smoking	Current	11	7.6
	No	70	48.6
	Previous	63	43.8
Alcoholism	Current	12	8.3
	No	92	63.9
	Previous	40	27.8
Physical activity	Sporadically	14	9.7
	Regularly	37	25.7
	No	93	64.6

Among those with comorbidities, the most prevalent conditions were Systemic Arterial Hypertension (SAH) in 88 individuals (48.3%) and Diabetes Mellitus (DM) in 27.5%, followed by Congestive Heart Failure (CHF) in 12.1%.

Regarding ventilatory support, the longest period of use ranged from one to two years (22.9%), and intermittent oxygen therapy was required by 86.1% of participants (Table 4).

DISCUSSION

The present study provides an overview of the profile of individuals enrolled in the Home Oxygen Therapy Program in Alfenas, Minas Gerais (MG). Similar studies have been conducted in the states of Rio Grande do Sul[7], Paraná[9], Santa Catarina[10], and São Paulo[11], offering valuable insights into the healthcare sector. However, to date, no studies addressing this characterization have been conducted specifically in the municipality under investigation.

Regarding gender distribution, 61.8% of the sample consisted of women, which aligns with findings from previous studies on home oxygen therapy users in Rio Grande do Sul (52.5%)[7], Paraná (66.6%)[9], Santa Catarina (55.6%)[10], and São Paulo (67.5%)[11].

The mean age of participants was 69 years, corroborating the results of a study in which the average age was 69.3 years[7]. A similar study conducted in São Paulo reported that 67.5% of participants were aged 60 or older[11], while a study in Santa Catarina found a mean age of 66 years[10].

Regarding self-declared skin color, 75 participants (52.1%) identified as white, which is consistent with

Table 3 – Distribution according to the clinical characteristics of patients registered in the Home Oxygen Therapy Program. Alfenas, Minas Gerais, Brazil, 2024 (N = 144).

Clinical characteristics		n	%
Medical diagnosis	Obstructive Sleep Apnea Syndrome	67	33.0
	Asthma	19	9.3
	Bronchitis	8	3.9
	Complications from COVID-19	3	1.5
	Cor pulmonale	3	1.5
	Chronic obstructive pulmonary disease	58	28.6
	Pulmonary emphysema	10	4.9
	Pulmonary fibrosis	2	1.0
	Pulmonary hypertension	10	4.9
	Pneumonia	9	4.4
	Tuberculosis	2	1.0
	Other diagnoses	11	5.4
	Could not answer	1	0.5
Comorbidities	Yes	103	71.5
	No	41	28.5
Mobility	Walks independently	107	74.3
	Walks with assistance	30	20.8
	Restricted to bed/bedridden	7	4.9

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Table 4 – Distribution according to time of use, type, source, and interface of patients registered in the Home Oxygen Therapy Program. Alfenas, Minas Gerais, Brazil, 2024 (N = 144).

Ventilatory support characteristics		n	%
Oxygen use time	Less than 1 year	4	2.8
	1 to 2 years	33	22.9
	3 to 4 years	28	19.4
	5 to 6 years	28	19.4
	7 to 8 years	13	9.0
	9 to 10 years	21	14.6
	11 to 12 years	8	5.6
	13 years or more	9	6.3
Intermittent or continuous use	Continuous	20	13.9
	Intermittent	124	86.1
Oxygen source	Portable concentrator and cylinder	67	46.5
	Not applicable	77	53.5
Interface	BIPAP	22	15.2
	Catheter	57	39.6
	Catheter and BIPAP	2	1.4
	Catheter and CPAP	1	0.7
	CPAP	57	39.6
	Mask	4	2.8
	Mask with a tracheostomy reservoir and BIPAP	1	0.7

another study's findings[7]. This data also reflects the racial distribution reported in the 2022 Census by the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística – IBGE), which indicates that most of the population in the studied municipality self-identified as white (61.35%, corresponding to 48,445 individuals)[12].

Another relevant sociodemographic characteristic was that 65.3% of participants were retired, and 76.4% had an income ranging from one to two times the minimum wage. This finding corroborates a systematic review indicating that most patients requiring home ventilatory support in Brazil belong to a low-income group, earning less than one and a half times the minimum wage[13].

Regarding education level, 28.5% of participants had incomplete primary education, a finding consistent with another study that characterized patients undergoing home oxygen therapy (HOT) in Paraná[9]. This data highlights the need for educational interventions tailored to the patients' literacy levels to ensure the effectiveness of health-related guidance[14].

In terms of marital status, 43.8% of participants were widowed, raising concerns as spouses often assume the role of primary caregivers[15]. Additionally, 54.2% lacked the support of a family member or professional caregiver. However, as 74.3% of participants were able to walk independently, it is possible that many did not require caregivers, though this aspect was not the primary focus of the study.

Regarding smoking habits, 48.6% of participants were non-smokers, while 43.7% were former smokers. This aligns with findings from a similar study, in which 60.6% of patients were former smokers[9]. Although smoking cessation reduces health risks, the long-term effects of smoking, such as direct lung tissue damage, contribute to permanent pulmonary impairment[13].

Regarding alcohol consumption, 63.9% of participants denied this habit, a result similar to that of a study conducted in Rio Grande do Sul, where 76.3% of participants reported not consuming alcohol[7]. Alcohol intake is associated with adverse health effects, including impaired tissue oxygenation, poor nutritional intake, and respiratory depression, which reduces respiratory rate and depth, as well as oxygen intake[16,17].

Physical inactivity was reported by 64.6% of participants, a finding corroborated by a study conducted in Paraná[9] and a scoping review on physical activity among COPD patients[18]. This review indicated that physical inactivity is more prevalent among women and older adults, mirroring the profile observed in the present study. A sedentary lifestyle is a strong predictor of all-cause mortality in COPD patients. However, engaging in physical activity can be challenging for individuals receiving HOT, as they may fear symptom exacerbation or experience difficulties performing exercises while using oxygen therapy equipment[18].

The present study identified Obstructive Sleep Apnea Syndrome (33.0%) as the most prevalent diagnosis, followed by COPD (28.6%). Various other comorbidities were also observed. Sleep apnea is a condition that can result in hypoxemia or hypoxia during sleep, often necessitating oxygen supplementation. The choice of ventilatory

support is guided by medical referral, disease complexity, and patient preference, with non-invasive ventilation or Continuous Positive Airway Pressure (CPAP) therapy as potential treatment options[19].

COPD was the most frequently reported condition in a similar study conducted in Paraná[9]. As a common chronic disease that leads to hypoxemia, COPD often requires oxygen therapy to improve arterial oxygenation, enhance well-being, and increase life expectancy[14,20]. Accordingly, the implementation of home oxygen therapy programs aims to optimize care, promote patient independence, and improve quality of life by enabling individuals to remain in their home environment, thereby reducing hospital readmissions[3].

An important finding in this study was that 74.3% of participants were able to walk independently, a crucial factor for maintaining ventilatory function and autonomy[21].

Among the most frequently reported comorbidities were Systemic Arterial Hypertension (SAH) and Diabetes Mellitus (DM). SAH can lead to organ damage and compromise ventilatory function. Consequently, oxygen therapy may be recommended as a supportive treatment to prevent hypoxemia[17].

The presence of SAH in this study aligns with findings from the 2019 National Health Survey, which indicated a higher prevalence of hypertension among women, older adults, individuals with lower educational levels, former smokers, and those with multiple comorbidities[22]—all characteristics observed in the present study's participants.

Regarding DM, increased blood glucose levels can impair circulation and reduce the oxygen-carrying capacity of red blood cells. In this context, oxygen therapy may play a role in improving oxygen delivery to body tissues[23]. Therefore, targeted healthcare strategies should be implemented to manage this condition effectively[24].

The results also indicate that 22.9% of participants had been undergoing HOT for one to two years, while 2.8% had initiated therapy within the past year. These findings suggest that HOT is often a long-term necessity, likely due to the chronic nature of the underlying diseases requiring its use[2].

Intermittent oxygen therapy was the predominant modality, reported by 86.1% of participants, a result consistent with findings from a similar study[7]. Regarding the oxygen source, 46.5% used both a portable concentrator and an oxygen cylinder. The portable concentrator was also the most utilized source in a study characterizing HOT patients in Santa Catarina[10]. The choice of oxygen source should consider patient mobility, electricity availability, costs, and individual preferences[20].

The most commonly used interfaces were the nasal catheter and CPAP, each used by 39.5% of participants. A study conducted in São Paulo reported similar findings, with most patients using the nasal catheter (50%)[11]. These results underscore the importance of health education to ensure patients and caregivers are adequately trained in device usage[11].

CPAP delivers a continuous flow of pressurized air and is used as a therapeutic option for non-invasive ventilation or for patients with persistent hypoxemia[17].

Studies have demonstrated that HOT positively impacts health outcomes[14] and contributes to reducing preventable hospitalizations and readmissions[25]. Within this context, the healthcare team plays a crucial role in managing patients requiring home ventilatory support. This process must be conducted with efficiency and humanization, ensuring comfort and quality of life, particularly given the complexity of oxygen therapy administration and ventilatory support technologies[4,5].

The role of nurses is essential in assessing, planning, implementing interventions, evaluating patient responses, and supervising care. Their involvement aims to prevent complications and reduce healthcare costs for patients, families, and the healthcare system[26].

One limitation of this study is the restriction of the sample to a single municipality, which limits the generalizability of the findings to other contexts.

CONCLUSION

The sociodemographic and clinical profile of individuals enrolled in the Home Oxygen Therapy Program was predominantly female, elderly, white, widowed, with incomplete primary education, Catholic, and retired, with no dependence on a family caregiver. Most participants denied smoking, alcohol consumption, and engaging in physical activity.

Regarding clinical characteristics, Obstructive Sleep Apnea Syndrome was the most prevalent diagnosis, followed by COPD, with hypertension and DM as the most frequent comorbidities. Oxygen therapy was most commonly administered intermittently via a nasal catheter, with portable concentrators and cylinders as the primary sources.

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Data collection: GNO, LCTS.
Data analysis and interpretation: GNO, LCTS, ACB, BABS, EMRD.
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