Review of Contemporary Philosophy
ISSN: 1841-5261, e-ISSN: 2471-089X
Vol 22 (1), 2023
Pp 5087 - 5097

The Multifaceted Role of Nursing and Laboratory Diagnostics in The Comprehensive Management of Obstructive Sleep Apnea: Review of Current Evidence

[1]- Rasha Hamoud Alruwaili,[2]- Laila Ali Alruwaili,[3]- Ashwaq Abdulrahman Alshammari ,[4]- Tina Mufleh Alruwaili ,[5]- Lina Muflih Mufadhi Alruwaili,[6]- Abdullah Saeed Alower ,[7]- Amirah Abdullah Mohammad Albeshi,[8]- Saud Moshari Saud Alshahrani,[9]-Halah Abdullah Saleh Alshehri,[10]-Majidah Abdullah Saad Alqahtani,[11]-Alhanouf Hindi Aljuhani

[1] Ksa, Ministry Of Health, Prince Mohammad Bin Abdulaziz Hospital -
[2] Ksa, Ministry Of Health, Maternity And Children's Hospital
[3] Ksa, Ministry Of Health, Prince Mutaib Bin Abdulaziz Hospital
[4] Ksa, Ministry Of Health, Women's, Maternity And Children Hospital
[5] Ksa, Ministry Of Health, Prince Mutaib Bin Abdulaziz Hospital
[6] Ksa, Ministry Of Health, King Abdullah Hospital Bisha
[7] Ksa, Ministry Of Health, School Health Care
[8] Ksa, Ministry Of Health, Erada And Mental Health Complex In Rayadh
[9] Ksa, Ministry Of Health, Prince Mohammed Bin Abdulaziz Hospital
[10]Ksa, Ministry Of Health, Prince Mohammed Bin Abdulaziz Hospital
[11]Ksa, Ministry Of Health, Prince Mohammed Bin Abdulaziz Hospital

Abstract

Background: Obstructive sleep apnea (OSA) is a widespread disorder characterized by recurrent airway blockages during sleep, leading to various psychological and physical health issues. Despite its prevalence, OSA remains underdiagnosed and inadequately managed, particularly in primary care settings.

Methods: This review synthesizes current literature on the role of nursing and laboratory diagnostics in recognizing, diagnosing, and managing OSA. It highlights the significance of validated screening tools, the use of polysomnography (PSG) and home sleep apnea testing (HSAT), and the implementation of evidence-based nursing interventions.

Results: The findings reveal that nursing professionals are pivotal in the early identification of OSA through effective screening methods. Research indicates that nurse-led interventions are comparable to specialist care in terms of patient outcomes, including adherence to positive airway pressure (PAP) therapy and overall patient satisfaction. The integration of telemedicine and remote monitoring has also shown promise in enhancing patient management and follow-up.

Conclusion: The review underscores the necessity of incorporating nursing roles within the management framework for OSA, advocating for enhanced training and resource allocation in primary care settings. A patient-centered approach that leverages nursing expertise can significantly improve the diagnosis and management of OSA, leading to better health outcomes.

Keywords: Obstructive sleep apnea, nursing interventions, diagnosis, polysomnography, primary care.

Received: 05 October 2023 **Revised**: 19 November 2023 **Accepted**: 02 December 2023

1. Introduction

Obstructive sleep apnoea (OSA) is a prevalent and costly disorder, defined by airway blockages during sleep at the pharyngeal level, which may manifest with or without symptoms [1]. This contrasts with central sleep apnea, which results from a dysregulation of breathing during sleep [2]. The person with obstructive sleep apnea (OSA) has over five occurrences per hour of partial (hypopnea) or complete (apnea) blockage of the upper airway while attempting to breathe. Apnoea is characterized by a whole blockage of the upper airway (>90%) persisting for over 10 seconds, whereas hypopnoea is identified as a partial airway obstruction (>30%) that results in a minimum 3% decrease in blood oxygen saturation or sleep arousals.

The apnoea–hypopnoea index (AHI) is the principal metric used in sleep study assessments to classify and evaluate the severity of obstructive sleep apnoea (OSA); nevertheless, this measure has intrinsic limitations, such as its failure to include the extent of concurrent hypoxia and the duration of respiratory episodes [3]. AHI values of 5, 15, and 30 serve as thresholds to classify obstructive sleep apnea (OSA) as mild, moderate, and severe, respectively [4]. The International Classification of Sleep Disorders (ICSD-3) defines obstructive sleep apnea (OSA) as: clinical manifestations of daytime sleepiness, apneas observed by a partner, or cardiometabolic irregularities, accompanied by an apnea-hypopnea index (AHI) exceeding 5 events per hour of sleep; or 15 or more predominantly obstructive breathing events per hour of sleep, without specific symptoms or comorbidities, noted [4,5]. Consequently, persons with OSA may have daytime somnolence, exhaustion, diminished energy, lethargy, impaired focus, irritability, morning headaches, snoring, and observable apneas during sleep, as reported by their bed partner [6].

The prevalence of OSA varies by nation and area [7]. It has been reported that one billion persons aged 30 to 69 worldwide may be afflicted with obstructive sleep apnea (OSA), with almost 425 million individuals experiencing moderate to severe instances, as determined by an Apnoea-Hypopnoea Index (AHI) threshold that necessitates treatment. In 2018, the prevalence of obstructive sleep apnea (OSA) in Europe was projected to be over 175 million, including roughly 90 million persons with moderate to severe OSA [8]. Pediatric patients with obstructive sleep apnea have a distinct clinical profile compared to adults. The incidence of obstructive sleep apnea in children ranges from 1% to 5% [9]. The prevalence of this illness often peaks between the ages of 2 and 8 years. In most instances, pediatric obstructive sleep apnea (OSA) is identified primarily owing to reports of snoring or referrals for surgical intervention related to adenoidal or tonsillar hypertrophy [10,11].

Identifying OSA-related risk factors and consequences is essential for successful therapeutic therapy. The progression of OSA is affected by many unchangeable and changeable risk factors. The immutable characteristics include advanced age, male gender, race/ethnicity, familial history of obstructive sleep apnea (OSA), and craniofacial anomalies [12-14]. Obesity, smoking, and alcohol use are modifiable risk factors for obstructive sleep apnea (OSA) [13,14]. Obstructive sleep apnea (OSA) is linked to an elevated risk of cardiovascular illnesses, metabolic disorders, cognitive decline, and cancer; a potential correlation between OSA and COVID-19 has also been investigated [15-27].

Polysomnography (PSG) is regarded as the definitive diagnostic instrument, complemented by other evaluation techniques to evaluate symptom intensity and delineate a clinical phenotype for therapy guidance [28]. Most persons regularly alter their sleeping position during the night, resulting in a variation in the duration of time spent sleeping supine vs non-supine. This may affect OSA diagnosis reliant on the AHI. The accuracy of this assessment is contingent upon the definition of hypopnoeas and other parameters, whereas the criteria for categorizing mild, moderate, and severe illness are derived from expert consensus rather than a definitive association between grade and the probability of unfavorable consequences [29]. Therefore, the diagnosis must maintain a holistic approach, integrating basic home sleep tests (e.g., respiratory polygraphy) with further assessments as necessary, along with symptomatic evaluation. The significance of other indicators for assessing the severity of OSA has been emphasized [30]. Additional efforts are required to investigate particular signals beyond the AHI [31].

Management of obstructive sleep apnea (OSA) primarily involves positive airway pressure (PAP) therapy, with continuous positive airway pressure (CPAP) regarded as the gold standard treatment.

Moreover, lifestyle modifications (e.g., weight reduction, increased physical activity), mandibular advancement appliances, and surgical interventions may be contemplated, however, their implementation is mostly contingent upon the patient's specific attributes [32,33].

Obstructive Sleep Apnea (OSA) is regarded as a heterogeneous disorder, characterized by a diverse array of symptoms, anthropometric traits, polysomnographic patterns, long-term consequences, and comorbidities [34]. To address these features, customized therapy must be formulated based on patient-reported outcome data, individual risk factors, and accessible therapeutic choices [33,34]. The ideal management of asymptomatic patients with mild to severe obstructive sleep apnea remains difficult. The management strategy should adhere to the notion that people with varying characteristics would get disparate treatment. Despite the differing mechanisms of action across therapeutic options, a commonality among these diverse treatments is the variability in effectiveness among people [35].

2. Management of Obstructive Sleep Apnea

Management of OSA differs by region and is contingent upon the patient's symptoms. Healthcare systems need to implement appropriate diagnostic and management techniques to mitigate the adverse health consequences associated with the illness [7]. Significant advancements have been made in the diagnosis and therapy of persons with obstructive sleep apnea in well-resourced environments [36]. The majority of obstructive sleep apnea (OSA) patients remain misdiagnosed and untreated, even in high-income nations. In low- and middle-income countries, knowledge of obstructive sleep apnea (OSA) is minimal, and diagnostic and therapeutic choices are often inaccessible or inadequately tailored for these environments [36,37]. The poor diagnostic rates of OSA may be largely attributed to its often asymptomatic nature. Given the co-morbidities, severe public health ramifications, and long-term economic impact of untreated OSA, it is essential to detect and manage people with this condition. The demand for specialized sleep units and the waitlists for consultations for these services have been rising. Given the chronic nature of this illness, its prevalence, and enduring repercussions, effective management is essential. A suggestion has been made for an innovative paradigm for addressing OSA in primary care settings [38]. The therapy of OSA should adopt a comprehensive strategy that includes several clinical settings, akin to the management of other common chronic disorders [38].

Management of obstructive sleep apnea in specialized sleep units is prevalent. It is important to note that managing OSA in sleep units may not be practical or essential for many persons, and there is a significant shortage of sleep experts for the thorough treatment of this disorder [39,40]. Evidence indicates that cost reductions and equivalent effectiveness may be achieved in primary care settings [38,41,42]. The ubiquity, accessibility, and cost concerns warrant the investigation of more inexpensive, trustworthy, but less costly alternatives. It is essential to engage all tiers of medical care in this process, including primary care providers and specialists not directly associated with sleep medicine, secondary hospitals capable of conducting simplified studies, and tertiary hospitals equipped with advanced technology and a multidisciplinary framework [43,44]. The engagement of primary care practitioners may enhance the diagnosis of OSA. This method employs outpatient diagnostic procedures and monitoring that do not need hospitalization [40]. A recently published consensus document introduces a potentially beneficial algorithm for primary care, enabling the assessment of patients with a high likelihood of disease, indicated by excessive daytime symptoms (Epworth Sleepiness Scale ESS ≥ 12), using single- or double-channel devices based on oximetry and/or nasal pressure [45]. The definitive diagnostic test for obstructive sleep apnea (OSA) is a polysomnography (PSG) conducted in a laboratory setting. If PSG is impractical, out-of-center sleep testing (OCST) or home sleep apnoea testing (HSAT) are viable alternatives [46].

Numerous investigations have shown that HSAT is equally efficient as laboratory-based treatment [47-51]. These studies indicate that HSAT is cost-effective, yields equivalent treatment choices, and is linked to similar adherence to PAP therapy. Additionally, patients indicated enhanced alertness and quality of life. Nonetheless, HSAT may possess some drawbacks compared to PSG owing to the disparity in the physiological parameters recorded and the absence of staff to modify sensors as required [52]. HSAT devices exhibit an elevated risk of technical malfunctions owing to insufficient real-time monitoring and

possess intrinsic restrictions stemming from the inability of the majority of devices to distinguish between sleep and waking states. A possible drawback is that positive airway pressure (PAP) cannot be started during a home sleep apnea test (HSAT) but may begin during polysomnography (PSG) if necessary [52]. PAP treatment may be used during an HSAT under certain conditions. Positive airway pressure treatment may be started during the diagnostic evaluation of sleep-disordered breathing with auto-titrating positive airway pressure (APAP) in some home sleep apnea testing (HSAT) devices [52,53].

3. The Function of Nurses in Diagnosing Obstructive Sleep Apnoea

Thorough patient history and the use of validated questionnaires: Suárez et al. [43] assert that initiating OSA therapy and diagnosis in a primary care environment is essential. Nurses are likely to screen patients since they serve as the first point of contact within the healthcare system. Utilizing screening instruments may reduce mortality and morbidity rates associated with OSA. Screening presents several obstacles, including insufficient understanding of identifying OSA, determining the optimal screening instrument for OSA, diagnosing OSA, and establishing follow-up protocols for identified patients across various settings [54]. Insufficient training and understanding of OSA screening instruments have been identified as obstacles to OSA screening in primary care settings [55]. The research concluded that nurses and primary care doctors would benefit from enhanced training regarding the identification of OSA and its health implications [56]. A variety of OSA screening instruments have been developed to enable rapid assessment of patients for OSA in both hospital and primary care environments [57]. Employing sensitive and specialized screening tools offers a cost-efficient approach to identifying OSA and deciding on patient referral to a sleep expert [58].

Research has shown that screening instruments help identify OSA in high-risk individuals. Primary care nurses and doctors have been trained on the risk factors, symptoms, associated comorbidities, and treatment choices for obstructive sleep apnea (OSA), as well as the use of screening instruments to facilitate early diagnosis. Research indicates that nurses used an array of screening instruments and questionnaires in both primary care environments and sleep units, including STOP-BANG, the five-dimensions questionnaire (EQ-5D), the SF-36 questionnaires, and the Epworth Sleepiness Scale [59-69]. A thorough sleep history should be obtained promptly after a positive OSA test or when the physician assesses that further assessment is warranted. Alongside body mass index (BMI) and neck circumference, blood pressure is a health metric that nurses are accountable for monitoring [68].

Conducting diagnostic tests for obstructive sleep apnea (OSA): Polysomnography (PSG) is widely recognized as the definitive approach for diagnosing OSA, but it often requires administration in a controlled, specialized environment [64]. Indeed, PSG is a complex and technological treatment that may be challenging to execute outside specialized sleep departments, thus limiting its use in general care or other environments. Consequently, individuals suspected of having OSA may endure prolonged delays before diagnosis and the initiation of medical treatment [43].

In recent years, HSAT has gained popularity as a cost-effective and efficient diagnostic tool, particularly when used with electroencephalography (EEG) measurements [64]. Refining algorithms using HSAT, with or without EEG data, may enhance the straightforward and efficient identification of OSA, hence obviating the need for PSG and expensive evaluations in sleep clinics [64]. Home respiratory polygraphy (HRP) is a streamlined, portable device that assesses airflow, respiratory effort, pulse oximetry, and body posture. Moreover, HRP has shown cost-effectiveness in identifying OSA, particularly in individuals with a strong pre-test suspicion of the condition [43]. It has been shown that some diagnostic methods are challenging to implement in primary care, whereas other tests may be appropriate for individuals without comorbidities associated with OSA [43]. Another aspect is that all tiers of medical treatment must be engaged. Coordination and cooperation are essential between the primary care healthcare team (i.e., nurses, and doctors) and the healthcare team in sleep units [43].

4. The Function of Nurses in the Monitoring and Assistance of Patients with Obstructive Sleep Apnoea

Treatment for obstructive sleep apnoea (OSA) is often multimodal, including PAP therapy, behavioral therapies, medical devices, and surgical options, contingent upon the patient's symptoms and clinical condition. Behavioral therapies include weight reduction strategies, physical activity, and sleep posture. These may provide advantages to a subset of patients, but the outcomes of therapies may not be evident immediately [66,68]. Strategies to improve adherence to PAP treatment and facilitate remote management of patients with OSA are gaining attention, including pharmaceutical interventions, telemedicine care techniques, and supplementary oxygen use. Fields et al. [63] discovered that a telemedicine-based strategy for facilitating PAP device use in the community yielded results comparable to conventional treatment, including advantages for mental health and patient functional outcomes. Telemedicine may serve as a foundation for remote assistance, demonstrating a high degree of satisfaction in the long-term treatment of obstructive sleep apnea (OSA); nevertheless, more research is required to expand upon this pilot trial, which lasted just three months and included 60 patients [63].

Nurses play a crucial role in follow-up and support, including patient education. In three randomized controlled studies, patient-reported sleepiness and adherence to PAP treatment were similar at six months across primary care units and specialty sleep care units [38,42]. Research was done to assess the capability of primary care clinicians to provide follow-up for patients with obstructive sleep apnea having positive airway pressure treatment [42]. Patients with OSA were randomly allocated to either the specialized sleep unit or primary care units for a six-month follow-up. The main outcome was compliance with PAP treatment at six months [42]. The secondary outcomes were the Epworth Sleep Scale (ESS) score, EuroQoL, patient satisfaction, body mass index (BMI), blood pressure, and cost-effectiveness. The findings indicate that primary care treatment of patients with obstructive sleep apnea (OSA) did not provide worse outcomes compared to sleep unit management and showed more cost-effectiveness than management by sleep specialists. This research engaged nurses in monitoring patients inside the sleep unit, in addition to those receiving primary care as detailed below [42].

In the primary care centers included in this trial, one primary care physician and one nurse engaged in a 6-hour instruction session that encompassed both theoretical and practical components of managing patients with obstructive sleep apnea (OSA). The instruction was provided by a sleep physician and a specialized nurse from the sleep unit, who oversaw the management of PAP therapy for the patients in this research allocated to the sleep unit group. The patients were monitored in person by a primary care physician or nurse to assess progress, assist with PAP device setup, offer guidance on managing PAP-related adverse effects, encourage adherence to PAP therapy, and provide education on lifestyle modifications. Additionally, the patients were instructed to complete pertinent research questions. Throughout the trial, the patients were monitored at 1, 3, and 6 months. Patients may also communicate with the primary care physician or nurse who conducted the follow-up visits via telephone if required. The administration of the sleep unit was conducted by the sleep unit specialist nurse like that previously executed by the primary care nurse [42]. This analysis found just one report concerning the therapy of pediatric obstructive sleep apnea (OSA) in kid patients [61].

The research aimed to assess the efficacy and satisfaction of a nurse-led telephone follow-up service for children post-surgery for sleep-disordered breathing (SDB) or obstructive sleep apnea (OSA) at a tertiary pediatric hospital. Telephone consultations for nursing follow-up were administered to patients who had undergone adenotonsillectomy instead of the conventional 4-to-8-week clinic visit post-surgery. A nurse specialist contacted parents by telephone for six weeks after the operation. The T-14 validated questionnaire was used to evaluate post-operative results. The efficacy of nurse-led telephone consultations was assessed by parents from June 2016 to April 2017. The research determined that a nurse-led telephone service offered postoperatively to patients after adenotonsillectomy is a successful approach for monitoring their post-operative care without jeopardizing safety or satisfaction [61].

5. Effectiveness of Nurse-Led Interventions

The function of the nurse in diagnosing and managing OSA may be elucidated via research assessing the efficacy of nurse-led treatments and management strategies. Effectiveness of nurse-led interventions: Research in Spain indicates that patients with obstructive sleep apnea (OSA) managed by primary care doctors and nurses in a primary care environment exhibit results comparable to those treated by specialists in sleep units [42]. Research by the Spanish Sleep Network found that adherence to PAP treatment was comparable across primary care and sleep units, with primary care settings exhibiting constant overall efficacy in care. Significantly, patient satisfaction and tiredness levels were elevated in the sleep unit environment [42]. Numerous studies have highlighted the significance of nursing care in both specialized and primary care environments [62,65-67]. Nurse-led interventions were observed to enhance symptoms, mood, quality of life, and adherence to PAP treatment in a study involving 80 patients [62].

A meta-analysis conducted by Gong et al. [67] revealed that nurse-led therapies were comparable to physician-led interventions for symptomatic improvement, cost-effectiveness, and quality of life. Furthermore, it was shown that nursing-led interventions, especially educational measures, might enhance adherence to PAP treatment, underscoring the significant role nurses can fulfill in both specialized and primary care environments to educate patients. A telephone-based instructional and personalized follow-up intervention done post-discharge from a sleep unit was determined to be effective, safe, and positively accepted by patients [66]. Nurse-led approaches have shown superior adherence to PAP treatment relative to standard care [62]. A comprehensive evaluation of eight RCTs has shown that educational programs may enhance PAP treatment adherence in community settings, although evidence for other techniques, including pharmaceutical therapies, is inadequate [66]. Patient education, a key nursing intervention, focuses on lifestyle modification techniques, including dietary improvement, reduction of high-calorie food intake, maintenance of a healthy lifestyle, and enhancement of physical activity [62]. Moreover, it has been proposed that a family member be included in the schooling since this would enhance the intervention at home [66]. This underscores the significance of nurse-led interventions in facilitating follow-up, minimizing problems, and decreasing superfluous physical follow-up in practice.

Qualitative research examined the viewpoints of patients and clinicians about the treatment of obstructive sleep apnea in primary care [65]. The research highlighted many obstacles, such as insufficient access to experts, inadequate awareness of OSA among primary care clinicians, and ambiguity around the duties of providers in OSA treatment. The integration of general care and specialized services, together with enhanced system navigation, is proposed as essential for enhancing OSA management. The examination of qualitative replies indicates that nurses may significantly contribute to patient education, information dissemination, and holistic support [65].

Recent evidence indicates that standards for the diagnosis, treatment, and nurse-led care of patients with OSA have advanced, highlighting the pivotal role of nurses in this process. The literature analysis indicates that nurses assume several responsibilities in the diagnosis, evaluation, care, and follow-up of patients with obstructive sleep apnea (OSA). This position entails delivering superior levels of care and proficiency in enhancing patient wellness, educating patients, and executing evidence-based practices across all care environments [70].

The change has significant ramifications for nurses in both specialized and primary care environments. Nurse-led care and evaluations may enhance specialist services as they become more standardized, with research supporting comparisons between nurse-led and physician-led care. Nurses in primary health care are optimally situated to provide excellent patient follow-up and education, using various strategies, including telemedicine, to enhance patient evaluation and avert treatment escalation. It is imperative to address concerns about the worldwide nursing shortage and the preparedness of nurses to manage the increasing patient population.

6. Constraints

The review process acknowledged a relative scarcity of research on the efficacy of nurses in providing OSA treatment in the community, particularly studies that compare nurse-led care with other methods. The prospective function of nursing in pediatric obstructive sleep apnea has been examined in a restricted number of studies. It is essential to ascertain the possible role of nursing in the holistic therapy of pediatric obstructive sleep apnea and to investigate alternative cost-effective strategies that include primary care environments. Nursing-led care is often underpinned by clinical trials rather than real-world application in patients with OSA; hence, it is essential to pursue more research on nurse-led care techniques in practice, using many research approaches, including qualitative investigations.

Over time, the evidence base has increasingly emphasized practice and indicates that nurses in various contexts may be poised to assume a more proactive role in the treatment of OSA, mirroring wider changes in the split between specialist and primary care. The study included studies published from 2015 to 2023; nonetheless, this particular timeframe may have constrained the number of articles included, therefore restricting our capacity to delineate more extensive responsibilities for nurses in OSA treatment.

7. Conclusions

The management of obstructive sleep apnea (OSA) necessitates a multidisciplinary approach, wherein nursing professionals play a crucial role in the continuum of care. This review highlights the significant impact of early detection and intervention in improving patient outcomes and reducing the burden of OSA on healthcare systems. Nurses are often the first point of contact for patients, allowing them to initiate screening and facilitate timely referrals to specialists. The use of validated screening tools, such as the STOP-BANG questionnaire and the Epworth Sleepiness Scale, enables nurses to effectively identify individuals at high risk for OSA.

Moreover, the review emphasizes the critical importance of polysomnography (PSG) as the gold standard for diagnosis, while also acknowledging the growing acceptance of home sleep apnea testing (HSAT) as a viable alternative. HSAT offers a cost-effective solution for diagnosing OSA, especially in settings where resources are limited. The integration of technology, such as telemedicine, has further enhanced the ability of nurses to monitor patients remotely, ensuring adherence to treatment protocols and providing ongoing support.

Nurse-led interventions have demonstrated comparable effectiveness to specialist care, underscoring the need for a paradigm shift in how OSA management is approached. By fostering collaboration between primary care providers and sleep specialists, and by empowering nurses through additional training and resources, healthcare systems can optimize the management of OSA.

In conclusion, addressing the complexities of OSA requires a robust framework that incorporates the strengths of nursing practice, advanced diagnostic techniques, and innovative management strategies. As the prevalence of OSA continues to rise globally, prioritizing nurse involvement in its management will be essential for improving patient outcomes and reducing the long-term health implications associated with this disorder. Future research should focus on the development of standardized nursing protocols and the exploration of novel interventions aimed at enhancing the care of patients with OSA.

References

1. Malhotra, A.; Orr, J.E.; Owens, R.L. On the cutting edge of obstructive sleep apnoea: Where next? Lancet Respir. Med. 2015, 3, 397–403.
2. Jun, J.C.; Chopra, S.; Schwartz, A.R. Sleep apnoea. Eur. Respir. Rev. 2016, 25, 12–18.
3. Feltner, C.; Wallace, I.F.; Aymes, S.; Middleton, J.C.; Hicks, K.L.; Schwimmer, M.; Baker, C.; Balio, C.P.; Moore, D.; Voisin, C.E.; et al. Screening for Obstructive Sleep Apnea in Adults: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA 2022, 328, 1951–1971.
4. Won, C.H.J. When will we ditch the AHI? J. Clin. Sleep Med. 2020, 16, 1001–1003.

5. Sateia, M.J. International classification of sleep disorders-third edition: Highlights and modifications. Chest 2014, 146, 1387–1394.
6. Riha, R.L. Defining obstructive sleep apnoea syndrome: A failure of semantic rules. Breathe 2021, 17, 210082.
7. Benjafield, A.V.; Ayas, N.T.; Eastwood, P.R.; Heinzer, R.; Ip, M.S.M.; Morrell, M.J.; Nunez, C.M.; Patel, S.R.; Penzel, T.; Pépin, J.-L.; et al. Estimation of the global prevalence and burden of obstructive sleep apnoea: A literature-based analysis. Lancet Respir. Med. 2019, 7, 687–698.
8. Malhotra, A.; Heinzer, R.; Morrell, M.J.; Penzel, T.; Pepin, J.-L.; Valentine, K.; Nunez, C.; Benjafield, A. Late Breaking Abstract—European prevalence of OSA in adults: Estimation using currently available data. Eur. Respir. J. 2018, 52, OA4961.
9. Fagundes, N.; Fagundes, F.; Perez-Garcia, A.; Graf, D.; Flores-Mir, C.; Heo, G. Orthodontic interventions as a management option for children with residual obstructive sleep apnea: A cohort study protocol. BMJ Open 2022, 12, 61651.
10. Sánchez-De-La-Torre, M.; Barbé, F. Cellular heterogeneity insights and molecular signatures in pediatric sleep apnoea. Eur. Respir. J. 2023, 61, 2202316.
11. Jennum, P.; Ibsen, R.; Kjellberg, J. Morbidity and mortality in children with obstructive sleep apnoea: A controlled national study. Thorax 2013, 68, 949–954.
12. Jehan, S.; Masters-Isarilov, A.; Salifu, I.; Zizi, F.; Jean-Louis, G.; Pandi-Perumal, S.R.; Gupta, R.; Brzezinski, A.; McFarlane, S.I. Sleep Disorders in Postmenopausal Women. J. Sleep Disord.Ther. 2015, 4, 212.
13. Rundo, J.V. Obstructive sleep apnea basics. Cleve. Clin. J. Med. 2019, 86, 2–9.
14. Young, T.; Skatrud, J.; Peppard, P.E. Risk Factors for Obstructive Sleep Apnea in Adults. JAMA 2004, 291, 2013–2016.
15. Almendros, I.; Basoglu, Ö.K.; Conde, S.V.; Liguori, C.; Saaresranta, T. Metabolic dysfunction in OSA: Is there something new under the sun? J. Sleep Res. 2022, 31, e13418.
16. Sánchez-De-La-Torre, M.; Barbé, F. Sleep disorders and cardiovascular disease. Med. Clínica (Engl. Ed.) 2022, 158, 73–75.
17. Nikodemova, M.; Finn, L.; Mignot, E.; Salzieder, N.; Peppard, P.E. Association of sleep-disordered breathing and cognitive deficit in APOE ε4 carriers. Sleep 2013, 36, 873–880.
18. Gaeta, A.M.; Benítez, I.D.; Jorge, C.; Torres, G.; Dakterzada, F.; Minguez, O.; Huerto, R.; Pujol, M.; Carnes, A.; Dalmases, M.; et al. Prevalence of obstructive sleep apnea in Alzheimer's disease patients. J. Neurol. 2020, 267, 1012–1022.
19. Jorge, C.; Targa, A.; Benítez, I.D.; Dakterzada, F.; Torres, G.; Minguez, O.; Carnes, A.; Pujol, M.; Gibert, A.; López, R.; et al. Obstructive sleep apnoea and cognitive decline in mild-to-moderate Alzheimer's disease. Eur. Respir. J. 2020, 56, 2000523.
20. Huang, T.; Lin, B.M.; Stampfer, M.J.; Schernhammer, E.S.; Saxena, R.; Tworoger, S.S.; Redline, S. Associations of self-reported obstructive sleep apnea with total and site-specific cancer risk in older women: A prospective study. Sleep 2021, 44, zsaa198.
21. Santamaria-Martos, F.; Sánchez-De-La-Torre, M.; Martínez-García, M.A. Sleep and Cancer: Clinical Studies and Opportunities for Personalized Medicine. Curr. Sleep Med. Rep. 2017, 3, 11–21.
22. Martínez-García, M.Á.; Campos-Rodriguez, F.; Barbé, F. Cancer and OSA: Current Evidence From Human Studies. Chest 2016, 150, 451–463.
23. Sánchez-De-La-Torre, M.; Cubillos, C.; Veatch, O.J.; Garcia-Rio, F.; Gozal, D.; Martinez-Garcia, M.A. Potential Pathophysiological Pathways in the Complex Relationships between OSA and Cancer. Cancers 2023, 15, 1061.
24. Labarca, G.; Henríquez-Beltrán, M.; Lamperti, L.; Nova-Lamperti, E.; Sanhueza, S.; Cabrera, C.; Quiroga, R.; Antilef, B.; Ormazábal, V.; Zúñiga, F.; et al. Impact of Obstructive Sleep Apnea (OSA) in COVID-19 Survivors, Symptoms Changes Between 4-Months and 1 Year After the COVID-19 Infection. Front. Med. 2022, 9, 1700.

25. Peker, Y.; Celik, Y.; Arbatli, S.; Isik, S.R.; Balcan, B.; Karataş, F.; Uzel, F.I.; Tabak, L.; Çetin, B.; Baygül, A.; et al. Effect of High-Risk Obstructive Sleep Apnea on Clinical Outcomes in Adults with Coronavirus Disease 2019. Ann. Am. Thorac. Soc. 2021, 18, 1548–1559.
26. Maas, M.B.; Kim, M.; Malkani, R.G.; Abbott, S.M.; Zee, P.C. Obstructive Sleep Apnea and Risk of COVID-19 Infection, Hospitalization and Respiratory Failure. Sleep Breath 2021, 25, 1155–1157.
27. Strausz, S.; Kiiskinen, T.; Broberg, M.; Ruotsalainen, S.; Koskela, J.; Bachour, A.; Palotie, A.; Palotie, T.; Ripatti, S.; Ollila, H.M.; et al. Sleep apnea is a risk factor for severe COVID-19. BMJ Open Respir. Res. 2021, 8, e000845.
28. Štengl, M.; Hirani, R.; Smiley, A. A Scoping Review of Sleep Apnea: Where Do We Stand? Life 2023, 13, 387.
29. Gottlieb, D.J.; Punjabi, N.M. Diagnosis and Management of Obstructive Sleep Apnea: A Review. JAMA 2020, 323, 1380–1400.
30. Azarbarzin, A.; Sands, S.A.; Stone, K.L.; Taranto-Montemurro, L.; Messineo, L.; Terrill, P.I.; Ancoli-Israel, S.; Ensrud, K.; Purcell, S.; White, D.P.; et al. The hypoxic burden of sleep apnoea predicts cardiovascular disease-related mortality: The Osteoporotic Fractures in Men Study and the Sleep Heart Health Study. Eur. Heart. J. 2019, 40, 1149–1157.
31. Pevernagie, D.A.; Gnidovec-Strazisar, B.; Grote, L.; Heinzer, R.; McNicholas, W.T.; Penzel, T.; Randerath, W.; Schiza, S.; Verbraecken, J.; Arnardottir, E.S. On the rise and fall of the apnea-hypopnea index: A historical review and critical appraisal. J. Sleep Res. 2020, 29, e13066.
32. Randerath, W.J.; Heise, M.; Hinz, R.; Ruehle, K.H. An individually adjustable oral appliance vs continuous positive airway pressure in mild-to-moderate obstructive sleep apnea syndrome. Chest 2002, 122, 569–575.
33. Lim, D.C.; Sutherland, K.; Cistulli, P.A.; Pack, A.I. P4 medicine approach to obstructive sleep apnoea. Respirology 2017, 22, 849–860.
34. Randerath, W.; de Lange, J.; Hedner, J.; Ho, J.P.T.F.; Marklund, M.; Schiza, S.; Steier, J.; Verbraecken, J. Current and novel treatment options for obstructive sleep apnoea. ERJ Open Res. 2022, 8, 00126–02022.
35. Lee-Iannotti, J.K.; Parish, J.M. Exercise as a treatment for sleep apnea. J. Clin. Sleep Med. 2020, 16, 1005–1006.
36. Jaiswal, S.; Owens, R.; Malhotra, A. Raising awareness about sleep disorders. Lung India 2017, 34, 262–268.
37. Laratta, C.R.; Ayas, N.T.; Povitz, M.; Pendharkar, S.R. Diagnosis and treatment of obstructive sleep apnea in adults. CMAJ 2017, 189, E1481–E1488.
38. Tarraubella, N.; Sánchez-De-La-Torre, M.; Nadal, N.; de Batlle, J.; Benítez, I.; Cortijo, A.; Urgelés, M.C.; Sanchez, V.; Lorente, I.; Lavega, M.M.; et al. Management of obstructive sleep apnoea in primary care vs sleep unit setting: A randomized controlled trial. Thorax 2018, 73, 1152–1160.
39. Martinez-Garcia, M.A.; Campos-Rodriguez, F.; Barbé, F.; Gozal, D.; Agustí, A. Precision medicine in obstructive sleep apnoea. Lancet Respir. Med. 2019, 7, 456–464.
40. Donovan, L.M.; Shah, A.; Chai-Coetzer, C.L.; Barbé, F.; Ayas, N.T.; Kapur, V.K. Redesigning Care for OSA. Chest 2020, 157, 966–976.
41. Ángeles Sánchez-Quiroga, M.; Corral, J.; Gómez-de-Terreros, F.J.; Carmona-Bernal, C.; Isabel Asensio-Cruz, M.; Cabello, M.; Martínez-Martínez, M.Á.; Egea, C.J.; Ordax, E.; Barbe, F.; et al. Primary care physicians can comprehensively manage patients with sleep apnea in a noninferiority randomized controlled trial. Am. J. Respir. Crit. Care Med. 2018, 198, 648–656.
42. Sánchez-De-La-Torre, M.; Nadal, N.; Cortijo, A.; Masa, J.; Duran-Cantolla, J.; Valls, J.; Serra, S.; Gracia, M.; Ferrer, F.; Lorente, I.; et al. Role of primary care in the follow-up of patients with obstructive sleep apnoea undergoing CPAP treatment: A randomised controlled trial. Thorax 2015, 70, 346–352.
43. Suárez, M.; Osorio, J.; Torres, M.; Montserrat, J.M. Should the diagnosis and management of OSA move into general practice? Breathe 2016, 12, 243–247.

44. Simonds, A.; de Backer, W. ERS Handbook of Respiratory Sleep Medicine; European Respiratory Society: Lausanne, Switzerland, 2012.
45. Mediano, O.; González Mangado, N.; Montserrat, J.M.; Alonso-Álvarez, M.L.; Almendros, I.; Alonso-Fernández, A.; Barbé, F.; Borsini, E.; Caballero-Eraso, C.; Cano-Pumarega, I.; et al. [Translated article] International consensus document on obstructive sleep apnea. Arch. Bronconeumol. 2022, 58, T52–T68.
46. Goyal, M.; Johnson, J. Obstructive Sleep Apnea Diagnosis and Management. Mo. Med. 2017, 114, 120–124.
47. Rosen, C.L.; Auckley, D.; Benca, R.; Foldvary-Schaefer, N.; Iber, C.; Kapur, V.; Rueschman, M.; Zee, P.; Redline, S. A Multisite Randomized Trial of Portable Sleep Studies and Positive Airway Pressure Autotitration Versus Laboratory-Based Polysomnography for the Diagnosis and Treatment of Obstructive Sleep Apnea: The HomePAP Study. Sleep 2012, 35, 757–767.
48. Masa, J.F.; Jiménez, A.; Durán, J.; Capote, F.; Monasterio, C.; Mayos, M.; Terán, J.; Hernández, L.; Barbé, F.; Maimó, A.; et al. Alternative methods of titrating continuous positive airway pressure: A large multicenter study. Am. J. Respir. Crit. Care Med. 2004, 170, 1218–1224.
49. Kuna, S.T.; Gurubhagavatula, I.; Maislin, G.; Hin, S.; Hartwig, K.C.; McCloskey, S.; Hachadoorian, R.; Hurley, S.; Gupta, R.; Staley, B.; et al. Noninferiority of functional outcome in ambulatory management of obstructive sleep apnea. Am. J. Respir. Crit. Care Med. 2011, 183, 1238–1244.
50. Berry, R.B.; Hill, G.; Thompson, L.; McLaurin, V. Portable monitoring and autotitration versus polysomnography for the diagnosis and treatment of sleep apnea. Sleep 2008, 31, 1423–1431.
51. Corral, J.; Sánchez-Quiroga, M.A.; Carmona-Bernal, C.; Sánchez-Armengol, A.; de la Torre, A.S.; Durán-Cantolla, J.; Egea, C.J.; Salord, N.; Monasterio, C.; Terán, J.; et al. Conventional polysomnography is not necessary for the management of most patients with suspected obstructive sleep apnea noninferiority, randomized controlled trial. Am. J. Respir. Crit. Care Med. 2017, 196, 1181–1190.
52. Kapur, V.K.; Auckley, D.H.; Chowdhuri, S.; Kuhlmann, D.C.; Mehra, R.; Ramar, K.; Harrod, C.G. Clinical Practice Guideline for Diagnostic Testing for Adult Obstructive Sleep Apnea: An American Academy of Sleep Medicine Clinical Practice Guideline. J. Clin. Sleep Med. 2017, 13, 479–504.
53. Rosen, I.M.; Kirsch, D.B.; Carden, K.A.; Malhotra, R.K.; Ramar, K.; Aurora, R.N.; Kristo, D.A.; Martin, J.L.; Olson, E.J.; Rosen, C.L.; et al. Clinical Use of a Home Sleep Apnea Test: An Updated American Academy of Sleep Medicine Position Statement. J. Clin. Sleep Med. 2018, 14, 2075–2077.
54. Peters, M.D.J.; Godfrey, C.M.; Khalil, H.; McInerney, P.; Parker, D.; Soares, C.B. Guidance for conducting systematic scoping reviews. Int. J. Evid. Based Healthc. 2015, 13, 141–146.
55. Page, M.J.; McKenzie, J.E.; Bossuyt, P.M.; Boutron, I.; Hoffmann, T.C.; Mulrow, C.D.; Shamseer, L.; Tetzlaff, J.M.; Akl, E.A.; Brennan, S.E.; et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ 2021, 372, N71.
56. Ouzzani, M.; Hammady, H.; Fedorowicz, Z.; Elmagarmid, A. Rayyan-a web and mobile app for systematic reviews. Syst. Rev. 2016, 5, 210.
57. Arksey, H.; O'Malley, L. Scoping studies: Towards a methodological framework. Int. J. Soc. Res. Methodol. 2007, 8, 19–32.
58. Braun, V.; Clarke, V. Using thematic analysis in psychology. Qual. Res. Psychol. 2006, 3, 77–101.
59. Davies, A. Carrying out systematic literature reviews: An introduction. Br. J. Nurs. 2019, 28, 1008–1014.
60. Nadelson, S.; Nadelson, L.S. Evidence-Based Practice Article Reviews Using CASP Tools: A Method for Teaching EBP. Worldviews Evid.-Based Nurs. 2014, 11, 344–346.
61. Walijee, H.; Sood, S.; Markey, A.; Krishnan, M.; Lee, A.; De, S. Is nurse-led telephone follow-up for post-operative obstructive sleep apnoea patients effective? A prospective observational study at a paediatric tertiary centre. Int. J. Pediatr. Otorhinolaryngol. 2020, 129, 109766.
62. Chen, X.; Chen, W.; Hu, W.; Huang, K.; Huang, J.; Zhou, Y. Nurse-led intensive interventions improve adherence to continuous positive airway pressure therapy and quality of life in obstructive sleep apnea patients. Patient Prefer. Adherence 2015, 9, 1707–1713.

63. Fields, B.G.; Behari, P.P.; McCloskey, S.; True, G.; Richardson, D.; Thomasson, A.; Korom-Djakovic, D.; Davies, K.; Kuna, S.T. Remote Ambulatory Management of Veterans with Obstructive Sleep Apnea. Sleep 2016, 39, 501–509.
64. Sabil, A.; Vanbuis, J.; Baffet, G.; Feuilloy, M.; Le Vaillant, M.; Meslier, N.; Gagnadoux, F. Automatic identification of sleep and wakefulness using single-channel EEG and respiratory polygraphy signals for the diagnosis of obstructive sleep apnea. J. Sleep Res. 2019, 28, e12795.
65. Pendharkar, S.R.; Blades, K.; Kelly, J.E.; Tsai, W.H.; Lien, D.C.; Clement, F.; Woiceshyn, J.; McBrien, K.A. Perspectives on primary care management of obstructive sleep apnea: A qualitative study of patients and health care providers. J. Clin. Sleep Med. 2021, 17, 89–98.
66. López-López, L.; Torres-Sánchez, I.; Cabrera-Martos, I.; Ortíz-Rubio, A.; Granados-Santiago, M.; Valenza, M.C. Nursing Interventions Improve Continuous Positive Airway Pressure Adherence in Obstructive Sleep Apnea With Excessive Daytime Sleepiness: A Systematic Review. Rehabil. Nurs. 2020, 45, 140–146.
67. Gong, F.; Chen, X.; Wu, Y.; Yao, D.; Xie, L.; Ouyang, Q.; Wang, P.; Niu, G. Nurse vs. physician-led care for obstructive sleep apnoea: A systematic review and meta-analysis of randomized trials. J. Adv. Nurs. 2018, 74, 501–506.
68. Miller, J.N.; Berger, A.M. Screening and assessment for obstructive sleep apnea in primary care. Sleep Med. Rev. 2016, 29, 41–51.
69. Turnbull, C.D.; Sen, D.; Kohler, M.; Petousi, N.; Stradling, J.R. Effect of Supplemental Oxygen on Blood Pressure in Obstructive Sleep Apnea (SOX). A Randomized Continuous Positive Airway Pressure Withdrawal Trial. Am. J. Respir. Crit. Care Med. 2019, 199, 211–219.
70. Nursing and Midwifery Council. The Code Professional Standards of Practice and Behaviour for Nurses, Midwives and Nursing Associates; Nursing and Midwifery Council: London, UK, 2018.

الدور المتعدد الأوجه للتمريض والتشخيصات المخبرية في الإدارة الشاملة لانقطاع النفس الانسدادي أثناء النوم: مراجعة الأدلة الحالية

الملخص

الخلفية :يُعد انقطاع النفس الانسدادي أثناء النوم (OSA) اضطرابًا شائعًا يتميز بانسدادات متكررة للمجرى الهوائي أثناء النوم، مما يؤدي إلى مشاكل صحية نفسية وجسدية متنوعة. على الرغم من انتشاره، لا يزال انقطاع النفس الانسدادي دون تشخيص وإدارة مناسبة، خاصة في الرعاية الأولية.

الطرق : تستعرض هذه المراجعة الأدبيات الحالية حول دور التمريض والتشخيصات المخبرية في التعرف على انقطاع النفس الانسدادي وتشخيصه وإدارته. تُبرز المراجعة أهمية أدوات الفحص المعتمدة، واستخدام دراسة النوم المتعددة (PSG) واختبار انقطاع النفس أثناء النوم المنزلي(HSAT) ، وتنفيذ التدخلات التمريضية المبنية على الأدلة.

النتائج :تشير النتائج إلى أن المتخصصين في التمريض يلعبون دورًا محوريًا في التعرف المبكر على انقطاع النفس الانسدادي باستخدام طرق فحص فعالة. تُظهر الأبحاث أن التدخلات التي يقودها التمريض تُضاهي رعاية المتخصصين من حيث نتائج المرضى، بما في ذلك الالتزام بالعلاج بضغط الهواء الإيجابي (PAP) ومستوى رضا المرضى بشكل عام. كما أظهرت تقنية التطبيب عن بُعد والرصد عن بُعد وعودًا كبيرة في تحسين إدارة المرضى ومتابعتهم.

الخلاصة :تُبرز المراجعة ضرورة دمج أدوار التمريض ضمن إطار إدارة انقطاع النفس الانسدادي، داعية إلى تعزيز التدريب وتخصيص الموارد في إعدادات الرعاية الأولية. يمكن لنهج يركز على المريض ويستفيد من خبرة التمريض أن يحسن بشكل كبير من تشخيص وإدارة انقطاع النفس الانسدادي، مما يؤدي إلى تحسين النتائج الصحية.

الكلمات المفتاحية :انقطاع النفس الانسدادي أثناء النوم، التدخلات التمريضية، التشخيص، دراسة النوم المتعددة، الرعاية الأولية.