

A Qualitative Study to Investigate the Preference of Older Individuals with Obstructive Sleep Apnea on a Continuous Positive Airway Pressure Machine in Thailand: An Outpatient Setting

Bundit Sawunyavisuth¹, Sasawan Heingraj², Suwakitti Amornpan², Darunee Jongudomkarn³, Kittisak Sawanyawisuth⁴

¹Department of Marketing, Faculty of Business Administration and Accountancy, Khon Kaen University, Khon Kaen, Thailand; ²Department of Business Administration, College of Business and Entrepreneurship, Winston-Salem State University, Winston-Salem, NC, USA; ³Department of Family and Community Nursing, Faculty of Nursing, Khon Kaen University, Khon Kaen, Thailand; ⁴Department of Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand

Correspondence: Kittisak Sawanyawisuth, Department of Medicine, Faculty of Medicine, Khon Kaen University, 123 Mitraparp Road, Khon Kaen, Thailand, Email kittisak@kku.ac.th

Background: Obstructive sleep apnea (OSA) is related to several cardiovascular diseases in older adults. The cornerstone of the treatment of OSA is a continuous positive airway pressure machine (CPAP). Factors associated with CPAP purchasing in older adults with OSA are limited, particularly by qualitative research. This study aimed to evaluate factors associated with CPAP purchasing in older adults with OSA by using qualitative study design.

Methods: This was a qualitative study and enrolled older adults with an age of 60 years old or more who diagnosed as obstructive sleep apnea, underwent the CPAP titration trial for at least three nights, and decided to purchase the CPAP after the CPAP titration trial. An in-depth interview was performed to identify factors associated with CPAP purchasing until data were saturated.

Results: There were 15 older adults participated in the study. Of those, eight patients (53.33%) were male, and the age range was between 62 and 72 years. There were four themes related to CPAP purchasing in older adults with OSA: Perspectives of OSA on health, family support, affordability, and benefits of CPAP. Older patients wanted to live peacefully, happily, and healthy. When diagnosed with OSA, they wanted to be treated and be healthier. Family members support the older adults with OSA to be treated with CPAP. Older adults with OSA worry about their family members as they want to live as long as possible to take care of their young family members. There are two main factors regarding a decision of CPAP purchasing in older adults with OSA: affordability and benefits of CPAP.

Conclusion: Perspectives of OSA on health, family support, affordability, and benefits of CPAP were factors associated with CPAP purchasing in older adults with OSA by the in-depth interview.

Keywords: daytime sleepiness, fatigue, decision

Introduction

Obstructive sleep apnea (OSA) is a common disease. A systematic review published in 2023 reported that the prevalence of OSA was 69% in the elderly individuals worldwide.¹ The American Heart Association (AHA) stated that up to 40–80% of patients with cardiovascular diseases such as hypertension, coronary artery disease, and stroke may have concurrent OSA.² A study of older male twins found that moderate/severe OSA was associated with myocardial perfusion abnormalities with an adjusted odds ratio of 3.6 ($P = 0.005$).³ If left untreated, individuals with OSA are at risk of the cardiovascular diseases stated by the AHA earlier as well as depression, or mortality.^{4,5} Risks of depression and mortality were 1.34 times (95% confidence interval of 1.05, 1.70) for depression and 1.38 times (95% confidence interval of 1.09, 1.76) for mortality.

The mainstay treatment for OSA is a continuous positive airway pressure machine (CPAP).² A cohort study of older adults with OSA, median age of 73 years, showed that CPAP lower mortality and cardiovascular diseases significantly by 47% and 10%, respectively.⁶ Even though it has been shown that CPAP is beneficial for health, CPAP purchasing rate was approximately 50%.⁷ The systematic review found that several factors were predictors of CPAP purchasing such as age, education, or being sleepiness. Older adults by 1.11 years, more education by 0.93 years, or being sleepiness evidence by high Epworth Sleepiness Scale by 0.61 were likely to purchase CPAP. Another study on marketing factors and CPAP purchasing showed that informative salesperson may increase CPAP purchasing rate by 9.478 times.⁸

Even though several quantitative reports showed predictors of CPAP purchasing in patients with OSA, decision-making for CPAP purchasing is complex, particularly in older adults. Several studies showed that to identify process of decision-making in patients may require an in-depth interview or qualitative study.^{9–12} A scoping review of 12 studies; mainly qualitative studies found that patients with complex care may need some specificities for decision-making.¹² Another qualitative study in older adults showed that classes and priority of decisions were related to decision-making in health-care plan.¹⁰ Additionally, there are limited data on CPAP purchasing by qualitative study, particularly in older adults. This study aimed to evaluate factors associated with CPAP purchasing in older adults with OSA by using qualitative study design.

Methods

This was a qualitative study conducted at public research hospital in Thailand. The inclusion criteria were older adults with an age of 60 years old or more who diagnosed with OSA, underwent the CPAP titration trial for at least three nights, and decided to purchase the CPAP after the CPAP titration trial. Diagnosis of OSA was made by using polysomnography with an apnea-hypopnea index of five or more events/hour.^{13–16} Eligible patients were recruited from Sleep Clinic, outpatient department by a purposive sampling. The study period was between January 2024 and August 2024.

Patients who met the eligibility criteria were invited to participate in the study. An informed consent was given prior to study participation. Each patient was interviewed with structured questions to identify perspectives of CPAP purchasing. The in-depth interviews were performed until data were saturated.^{17,18} Data were collected in regard to how they spend their lives currently, important factors of living as an older adults, experiences and perspectives on sleep apnea, and factors associated with CPAP purchasing. Data collection was based on three principles including data triangulation, methodological triangulation, and theory triangulation. We analyzed the data by using mix-method between Colaizzi's method and van Kaam's method.^{19–23} There were six steps for data coding and theme identification including

Step 1: Transcription and familiarization. All interviews were transcribed, and the transcribed tape was read and re-read several times to gain a holistic understanding.

Step 2: Extracting significant statements/listing initial codes. Key phrases related to caregiving challenges were from participants' statements.

Step 3: Formulating meanings/reducing and eliminating statements. Each statement was interpreted to derive meaning, while irrelevant or redundant statements were removed.

Step 4: Clustering themes. Similar meanings were grouped into themes.

Step 5: Developing themes/identifying core elements. Themes were categorized into overarching domains.

Step 6: Describing the essence of the experience. A synthesized description of the preference of older individuals with obstructive sleep apnea on a continuous positive airway pressure machine was written to represent participants' shared realities.

Themes and examples of quotes of CPAP purchasing in older adults with OSA were reported.

Results

There were 15 elderly patients diagnosed with OSA and decided to purchase CPAP machine. Of those, eight patients (53.33%) were male, three patients were widowed, and most patients lived with their children, retired from the government officers, and had health insurance to cover CPAP or had no financial issue on buying CPAP. The age range was between 62 and 72 years. There were four themes related to CPAP purchasing in older adults with OSA (Figure 1).

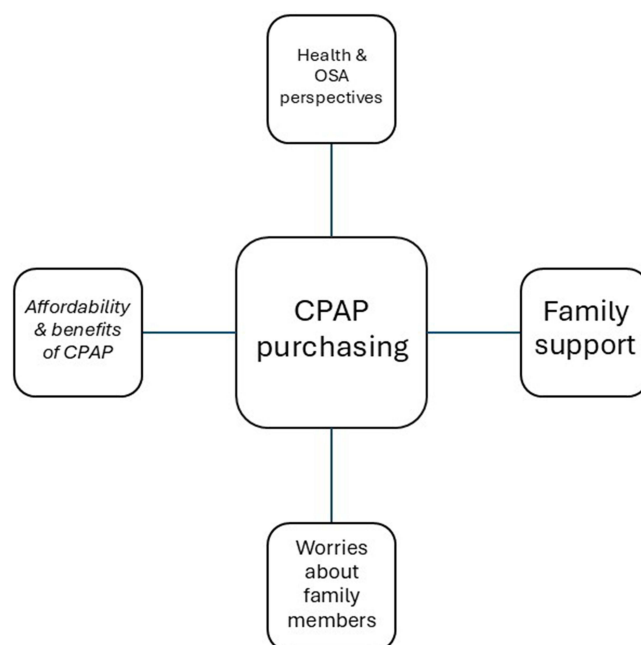


Figure 1 Four main themes on factors associated with a decision of continuous positive airway pressure machine (CPAP) purchasing in older adults with obstructive sleep apnea (OSA).

Health and OSA Perspectives in Older Patients with OSA

Older patients wanted to live peacefully without rush, live happily, and live healthy. They experienced a lot of things in their lives, both good and bad events. The most important thing was to be healthy as they did not want to be dependent and needed one child to take care of them in the future. When diagnosed with OSA, they wanted to be treated and be healthier.

As an older adult, the most important thing is to be healthy. To live longer, I will see success of my children and grandchildren. (Patient 1: 65 years, female)

To live until now, health status is the most important thing. I am so proud of me about my successful job and my children. They graduated from college and one of them works as a governor. (Patient 2: 69 years, male)

The most valuable thing in my life at this age is to live with children and grandchildren, and to take care of them. (Patient 3: 65 years, male)

I want to live peacefully and do not want to work, though I received a lot of offers. (Patient 4: 62 years, female)

The most important thing in my life now is to live with family. I want my family to be happy. I want my children and grandchildren to success in their lives and be independent. I am worried about some of them who may struggle in their lives. I am trying to be a role model for them. (Patient 5: 72 years, male)

When I was tested for sleep study and diagnosed as sleep apnea, this was critical. I was stressed out, and worried about it. It may cause sudden death during sleep, fatigue, and unrefreshed sleep. Sleep apnea may worsen more and more. If I used CPAP, symptoms may be improved. (Patient 6, 65 years, male with diabetes and hypertension more than 10 years)

I am a stressful person. I am worried about my youngest son and my poor sleep quality. My blood pressure was high at 190 mmHg, so I should be treated with an auto CPAP. It may help me with my sleep quality and my high blood pressure. If I get a good sleep quality, I may feel better and less irritable (Patient 7: 68 years, male)

I stop breathing 21 times/hour with diabetes, high blood pressure, and high cholesterol. I am trying to keep myself healthy by exercising regularly and eating healthy food. I want to treat my sleep apnea as well to be healthy. (Patient 8, 64 years, male)

Family Support

Family members support the older adults with OSA to be treated with CPAP. They did research on how to treat sleep apnea with CPAP and showed their support on CPAP use as well.

My daughters who lived in another province bought the machine for me and my husband. They always give me a call frequently to remind me and my husband to use CPAP every night. They said that they want me to live long and support them. (Patient 9: 62 years, female, merchant, three daughters)

I take care of my wife as I did not take care of her well in the past. I worked too hard previously and spent time with friends too much. I do not have any financial issues about buying CPAP. So, I bought for her. (Patient 2: 69 years, male)

My sons and daughters bought the machine for me. This makes me so glad that they take care of me. (Patient 7: 68 years, male; Patient 10: 69 years, male with renal disease)

I have sleep apnea, and it makes me tired. I am scared and afraid of dying. My son told me to treat with the best machine. (Patient 11: 70 years, female)

My wife is so worried about me. She saw I stop breathing during the night and had difficulty breathing while sleeping. She always woke me up during the night as she was afraid of sudden death during the night. She told me to purchase CPAP as my snoring was better while trying the CPAP. The machine makes my wife feeling released about my apnea and my symptoms (Patient 8, 64 years, male)

Worries About Their Family Members

Older adults with OSA worry about their family members as they want to live as long as possible to take care of their young family members, particularly nieces and nephews. These older adults do not work, so they have a role as a babysitter.

I decided to purchase CPAP as I am afraid of sudden death. I want to take care of my son. (Patient 4: 62 years, female)

When I first tried with the machine, I could not breathe due to high pressure. But I am afraid of dying as I live alone. I want to live long to take care of my nieces and nephews. (Patient 12: 72 years, female, widowed)

Actually, I do not want to live long. But I want to raise my niece and see her grow up. I also want to live and be a good role model for my niece. (Patient 5: 72 years, male)

Factors Associated with CPAP Purchasing

There are two main factors regarding a decision of CPAP purchasing in older adults with OSA: affordability and benefits of CPAP. The affordability for CPAP is from pocket money or health insurance coverage, while benefits of CPAP include symptom improvement and sleep quality improvement.

Affordability

My sons and daughters bought CPAP for me as I was unable to buy it. (Patient 5: 72 years, male)

When my doctor told me that I stopped breathing, and he asked me if I wanted to use it or not. I have enough budget to buy it. I spent a lot of money on other unnecessary things, this machine is good for my health. I should get it. (Patient 13: 67 years, male)

I think most people may not hear about sleep apnea and do not know how to treat it. My wife also does not know about it. The machine is covered by her health insurance. We decided to buy it and hope that it is good for her health. (Patient 2: 69 years, male)

As an older adult, I do three things: keep healthy, be calm, and be easy in life without worries. I have enough money with health insurance to cover the machine cost. (Patient 11: 70 years, female)

Benefits of CPAP

Older adults with OSA stated that they had a new life after CPAP trial and good sleep.

After CPAP trial, I felt a lot better, felt refreshed, and had no fatigue as previously. I felt like I had a new life. (Patient 7: 68 years, male)

When my doctor told me to have a CPAP trial, I did not want to try as some patients told me that it was discomfort. But I could use it and felt so refreshed. (Patient 4: 62 years, female)

The machine makes my breathing smooth. Without it, I could not breathe while sleeping and I was worried about my breathing. (Patient 10: 69 years, male with renal disease)

Some patients told me that the machine is a foreign body on us. But it makes me confident that I will not have a sudden death while sleeping. (Patient 14: 62 years, female)

I was scared about my sleep apnea. I stopped breathing 21 times/ hour. I thought it was just snoring. When I used the machine, I did not snore at all. (Patient 8, 64 years, male)

I have had a problem of poor sleep and insomnia for years. When I tried the machine, it helped me with my sleep. I sleep deeply and peacefully with the machine. (Patient 13: 67 years, male)

I could not breathe while sleeping and I had to wake up to have a deep breath. I am also worried about sudden death. This machine makes me confident that I will not have sudden death. My family members also feel relaxed if I have the machine. (Patient 9: 62 years, female, merchant, three daughters)

The machine makes me breathe better and I am satisfied with my sleep. I am feeling better and do not have fatigue with it. (Patient 15: 70 years, female)

My husband always checks on me during my sleep as I stop breathing during the night. But I do not have those events after using the machine. (Patient 1: 65 years, female)

Discussion

Older adults with OSA who decided to purchase CPAP wanted to be healthy and live longer (Patient 1: 65 years, female). Their perspectives on OSA are that OSA is a critical condition that may lead to cardiovascular diseases and nocturnal death (Patient 6, 65 years, male with diabetes and hypertension more than 10 years).² As previously reported, a systematic review of older adults (mean age of 62 years) found that OSA was independently related to sudden death by 1.74 times; 95% confidence interval of 1.44, 2.10.²⁴ Nocturnal death was occurred more in patients with OSA than in those without OSA (46% vs 21%; $p = 0.01$).²⁵

Additionally, older adults showed fear of death from OSA; I want to live with my family (Patient 5: 72 years, male). A previous study in older adults confirmed that poor health condition increased risk of fear of death from known cause significantly ($\beta = -0.11$; $p < 0.01$).²⁶ Additionally, previous studies in older adults found that meaning in life significantly associated with self-esteem and death anxiety ($p < 0.01$) and low parental self-efficacy was significantly related to loneliness and death anxiety.^{27,28} Older adults in this study showed that they have meaning in life: being proud of themselves (Patient 2: 69 years, male) and parental self-efficacy: correlation with family (Patient 2: 69 years, male; Patient 3: 65 years, male). The good correlation with family was also an indicator of low loneliness in older adults. Once again, these older adults received good support from their families, resulting in low loneliness: my daughters bought the machine for me, and they always reminded me to use it (Patient 9: 62 years, female, merchant, three daughters). Several studies showed that family can improve loneliness of older adults.^{29–32} Both children's emotional support and children's caregiving support significantly lower the loneliness of older adults ($\beta = 3.920$, $p < 0.05$ and $\beta = 3.801$, $p < 0.001$, respectively).³¹ Even though CPAP was shown to be beneficial in terms of cardiovascular protection such as stroke or cognitive impairment,^{33,34} there are several limitations or challenges in older adults with OSA to accept and purchase CPAP.³⁵ Older adults may face problems with cognition or understanding how to use the CPAP. Support from family members may recognize and realize the benefits

of CPAP in prevention of cardiovascular diseases leading to a decision to purchase CPAP for older adults. Additionally, family members may be a caregiver to assist older adults with OSA to comply with CPAP. A previous study in women with OSA found that relationship conflict with spouse was leading to low CPAP compliance ($r = -0.60$; $p < 0.05$).³⁶

The other two themes that associated with a purchasing decision: affordability and benefits of CPAP. A previous study found that patients with high economic status had higher chance of purchasing CPAP with adjusted odds ratio of 1.23 (95% confidence interval of 1.02, 1.40; $p = 0.03$).³⁷ The same study also showed that those with OSA symptoms, such as daytime sleepiness, were also likely to purchase CPAP by 35% ($p = 0.002$). This qualitative study confirmed these findings from the quantitative study: I have enough budget to buy it (Patient 13: 67 years, male); I feel so refreshed after the CPAP trial (Patient 4: 62 years, female). Fatigue was previously reported to be associated with future CPAP adherence 5.380 times.³⁸ In this study, older adults with fatigue symptom were associated with purchasing CPAP: I am feeling better and do not have fatigue (Patient 15: 70 years, female).

Unlike the quantitative study,⁷ results of this study may be important factors associated with CPAP purchasing in older adults with OSA. Both affordability and benefits of CPAP were the top factors ranked by the participants from an in-depth interview until data saturation. Factors associated with CPAP purchasing by the quantitative study may be several and cannot be ranked. Physicians may use the results of this study to facilitate CPAP purchasing in older adults with OSA. There are some limitations in this study. First, the results of this study may not be generalized for older adults particularly in terms of affordability. Those with full insurance coverage may not have this issue, while those with financial constraint may have similar results with this study. Second, this study did not evaluate the effects of CPAP use such as symptom improvement. Finally, other aspects of CPAP such as adherence or compliance with CPAP machine were not studied. Further studies are required to examine these aspects, particularly in older adults.

In conclusion, perspectives of OSA on health, family support, affordability, and benefits of CPAP were factors associated with CPAP purchasing in older adults with OSA by the in-depth interview. Generalizability of the results may be limited to those with insurance or financial constraints. Further studies with CPAP adherence or compliance in older adults may be required.

Data Sharing Statement

Data are available upon request to the corresponding author.

Ethics Approval and Consent to Participate and Publish

This study was performed in accordance with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of Khon Kaen University, Thailand (HE651187). Written informed consent was obtained from all individual participants included in this study. The study participants gave consent to publish including anonymized responses/direct quotes.

Acknowledgments

This study by Khon Kaen University has received funding support from the National Science Research and Innovation Fund (NSRF); ID 4695900.

Disclosure

The authors declare that they have no conflict of interest of any nature regarding this study.

References

1. de Araujo Dantas AB, Gonçalves FM, Martins AA, et al. Worldwide prevalence and associated risk factors of obstructive sleep apnea: a meta-analysis and meta-regression. *Sleep Breath.* 2023;27(6):2083–2109. doi:10.1007/s11325-023-02810-7
2. Yeghiazarians Y, Jneid H, Tietjens JR, et al. Obstructive Sleep Apnea and Cardiovascular Disease: a Scientific Statement From the American Heart Association. *Circulation.* 2021;144(3):e56–67. doi:10.1161/CIR.0000000000000988
3. Vaccarino V, Shah AJ, Moncayo V, et al. Obstructive sleep apnea, myocardial perfusion and myocardial blood flow: a study of older male twins. *PLoS One.* 2022;17(11):e0278420. doi:10.1371/journal.pone.0278420
4. Budhiraja R, Quan SF. Long-term All-Cause Mortality Risk in Obstructive Sleep Apnea Using Hypopneas Defined by a ≥ 3 Percent Oxygen Desaturation or Arousal. *Southwest J Pulm Crit Care.* 2021;23(1):23–35. doi:10.13175/swjpc025-21
5. Zhao DF, Zhang YZ, Sun X, Su CY, Zhang LQ. Association between obstructive sleep apnea severity and depression risk: a systematic review and dose-response meta-analysis. *Sleep Breath.* 2024;28(5):2175–2185. doi:10.1007/s11325-024-03083-4

6. Mazzotti DR, Waitman LR, Miller J, et al. Positive Airway Pressure, Mortality, and Cardiovascular Risk in Older Adults With Sleep Apnea. *JAMA Network Open*. 2024;7(9):e2432468. doi:10.1001/jamanetworkopen.2024.32468
7. Sawunyavisuth B, Ngamjarus C, Sawanyawisuth K. A meta-analysis to identify factors associated with CPAP machine purchasing in patients with obstructive sleep apnea. *Biomed Rep*. 2022;16(6):45. doi:10.3892/br.2022.1528
8. Sawunyavisuth B, Sopapol N, Tseng CH, Sawanyawisuth K. Marketing factors associated with a continuous positive airway pressure machine purchasing in patients with obstructive sleep apnea. *Future Sci OA*. 2023;9(3):FSO844. doi:10.2144/fsoa-2022-0073
9. Ho YF, Chen YC, Li IC. A qualitative study on shared decision-making of patients with chronic kidney disease. *Nurs Open*. 2021;8(6):3430–3440. doi:10.1002/nop.2.891
10. Fried TR, Street RL, Cohen AB. Chronic Disease Decision Making and ‘What Matters Most. *J Am Geriatr Soc*. 2020;68(3):474–477. doi:10.1111/jgs.16371
11. Keij SM, van Duijn-Bakker N, Stiggelbout AM, Pieterse AH. What makes a patient ready for Shared Decision Making? A qualitative study. *Patient Educ Couns*. 2021;104(3):571–577. doi:10.1016/j.pec.2020.08.031
12. Perron ME, Hudon C, Roux-Levy PH, Poitras ME. Shared decision-making with patients with complex care needs: a scoping review. *BMC Prim Care*. 2024;25(1):390. doi:10.1186/s12875-024-02633-9
13. Serrano S, Patané L, Serghini O, Scarpa M. Detection and Classification of Obstructive Sleep Apnea Using Audio Spectrogram Analysis. *Electronics*. 2024;13(13):2567. doi:10.3390/electronics13132567
14. Sabil A, Glos M, Veauthier C, et al. Comparison of Apnea Detection Using Oronasal Thermal Airflow Sensor, Nasal Pressure Transducer, Respiratory Inductance Plethysmography and Tracheal Sound Sensor. *J Clin Sleep Med*. 2019;15(02):285–292. doi:10.5664/jcsm.7634
15. Mendonca F, Mostafa SS, Ravelo-Garcia AG, Morgado-Dias F, Penzel T. A Review of Obstructive Sleep Apnea Detection Approaches. *IEEE J Biomed Health Inform*. 2019;23(2):825–837. doi:10.1109/JBHI.2018.2823265
16. Berry RB, Brooks R, Gamaldo C, et al. AASM Scoring Manual Updates for 2017 (Version 2.4). *J Clin Sleep Med*. 2017;13(05):665–666. doi:10.5664/jcsm.6576
17. Saunders B, Sim J, Kingstone T, et al. Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant*. 2018;52(4):1893–1907. doi:10.1007/s1135-017-0574-8
18. Banafshi Z, Khatony A, Jalali A, Jalali R. Exploring the lived experiences of women with multiple gestations in Iran: a phenomenological study. *BMC Pregnancy Childbirth*. 2024;24:203. doi:10.1186/s12884-024-06384-4
19. Wirihana L, Welch A, Williamson M, Christensen M, Bakon S, Craft J. Using Colaizzi’s method of data analysis to explore the experiences of nurse academics teaching on satellite campuses. *Nurse Res*. 2018;25(4):30–34. doi:10.7748/nr.2018.e1516
20. Sumskis S, Moxham LJ. The use of van Kaam’s psychophenomenological method to interpret the meaning of resilience in the experiences of people with schizophrenia. *Nurse Res*. 2017;25(3):8–13. doi:10.7748/nr.2017.e1514
21. Shorey S, Ng ED. Examining characteristics of descriptive phenomenological nursing studies: a scoping review. *J Adv Nurs*. 2022;78(7):1968–1979. doi:10.1111/jan.15244
22. Raskind IG, Shelton RC, Comeau DL, Cooper HLF, Griffith DM, Kegler MC. A Review of Qualitative Data Analysis Practices in Health Education and Health Behavior Research. *Health Educ Behav*. 2019;46(1):32–39. doi:10.1177/1090198118795019
23. Birt L, Scott S, Cavers D, Campbell C, Walter F. Member Checking: a Tool to Enhance Trustworthiness or Merely a Nod to Validation? *Qual Health Res*. 2016;26(13):1802–1811. doi:10.1177/1049732316654870
24. Heilbrunn ES, Ssentongo P, Chinchilli VM, Oh J, Ssentongo AE. Sudden death in individuals with obstructive sleep apnoea: a systematic review and meta-analysis. *BMJ Open Respir Res*. 2021;8(1):e000656. doi:10.1136/bmjresp-2020-000656
25. Gami AS, Howard DE, Olson EJ, Somers VK. Day-night pattern of sudden death in obstructive sleep apnea. *N Engl J Med*. 2005;352(12):1206–1214. doi:10.1056/NEJMoa041832
26. Cicirelli VG. Fear of death in older adults: predictions from terror management theory. *J Gerontol B Psychol Sci Soc Sci*. 2002;57(4):358–366. doi:10.1093/geronb/57.4.P358
27. Greenblatt-Kimron L, Kestler-Peleg M, Even-Zohar A, Lavenda O. Death Anxiety and Loneliness among Older Adults: role of Parental Self-Efficacy. *Int J Environ Res Public Health*. 2021;18(18):9857. doi:10.3390/ijerph18189857
28. Zhang J, Peng J, Gao P, et al. Relationship between meaning in life and death anxiety in the elderly: self-esteem as a mediator. *BMC Geriatr*. 2019;19(1):308. doi:10.1186/s12877-019-1316-7
29. Teh JKL, Tey NP, Ng ST. Family Support and Loneliness among Older Persons in Multiethnic Malaysia. *Sci World J*. 2014;2014:654382. doi:10.1155/2014/654382
30. Bražínová I, Chytil O. The family as a source of social support for older adults: implications for gerontological social work. *J Social Work*. 2024;24(3):339–356. doi:10.1177/14680173231222612
31. Huang R, Gong R, Deng Q, Hu Y. The effect of intergenerational support from children on loneliness among older adults-the moderating effect of internet usage and intergenerational distance. *Front Public Health*. 2024;12:1330617. doi:10.3389/fpubh.2024.1330617
32. Phuangcharoen C, Thayansin S. The Loneliness of Older Adults Associated with Various Types of Thai Families. *J Population Soc Stud*. 2022;30:207–221. doi:10.25133/JPSv302022.013
33. Wickwire EM, Bailey MD, Somers VK, et al. CPAP adherence is associated with reduced risk for stroke among older adult Medicare beneficiaries with obstructive sleep apnea. *J Clin Sleep Med*. 2021;17(6):1249–1255. doi:10.5664/jcsm.9176
34. Mullins AE, Kam K, Parekh A, Bubu OM, Osorio RS, Varga AW. Obstructive Sleep Apnea and Its Treatment in Aging: effects on Alzheimer’s disease Biomarkers, Cognition, Brain Structure and Neurophysiology. *Neurobiol Dis*. 2020;145:105054. doi:10.1016/j.nbd.2020.105054
35. Joskin A, Bruyneel M. Challenges in Obstructive Sleep Apnea Management in Elderly Patients. *J Clin Med*. 2024;13(24):7718. doi:10.3390/jcm13247718
36. Baron KG, Gunn HE, Wolfe LF, Zee PC. Relationships and CPAP adherence among women with obstructive sleep apnea. *Sleep Sci Pract*. 2017;1(1):10. doi:10.1186/s41606-017-0011-x
37. Brin YS, Reuveni H, Greenberg S, Tal A, Tarasiuk A. Determinants affecting initiation of continuous positive airway pressure treatment. *Isr Med Assoc J*. 2005;7(1):13–18.
38. Kaewkes C, Sawanyawisuth K, Sawunyavisuth B. Are symptoms of obstructive sleep apnoea related to good continuous positive airway pressure compliance? *ERJ Open Res*. 2020;6(3):1–4. doi:10.1183/23120541.00169-2019

Patient Preference and Adherence

Dovepress
Taylor & Francis Group

Publish your work in this journal

Patient Preference and Adherence is an international, peer-reviewed, open access journal that focusing on the growing importance of patient preference and adherence throughout the therapeutic continuum. Patient satisfaction, acceptability, quality of life, compliance, persistence and their role in developing new therapeutic modalities and compounds to optimize clinical outcomes for existing disease states are major areas of interest for the journal. This journal has been accepted for indexing on PubMed Central. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/patient-preference-and-adherence-journal>