Experiences of Using Positive Airway Pressure for Treatment of Obstructive Sleep Apnoea: A
Systematic Review and Thematic Synthesis

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Abstract

Study objectives

Sub-optimal use of positive airway pressure (PAP) to treat obstructive sleep apnoea (OSA) continues to be a major challenge to effective treatment. Meanwhile, the individual and societal impacts of untreated OSA make effective treatment a priority. Although extensive research has been conducted into factors that impact PAP use, it is estimated that at least half of users do not use it as prescribed. However, the voice of users is notably minimal in the literature. A systematic review and qualitative metasynthesis of PAP user experience was conducted to contribute to understandings of how PAP is experienced and to inform how usage could be improved.

Methods

PsycINFO, MEDLINE, CINAHL and EMBASE databases were systematically searched. Primary research findings of adult experiences using PAP that had been inductively analysed were included. Papers were critically appraised using the CASP qualitative checklist to generate a “hierarchy of evidence”. Thematic synthesis was then conducted to generate analytical themes. Results were presented in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA).

Results

25 papers reporting on over 398 people’s experiences were analysed to generate 4 themes: Journey to PAP, Discomfort from and around PAP, Adapting to and using PAP, and Benefits from PAP. Author reflexivity and vulnerability to bias is acknowledged.

Conclusions

This metasynthesis gave voice to user experiences of PAP, revealing barriers to PAP use at a healthcare service level across the world. The findings highlight ways in which services may be able to address these barriers to enhance PAP use.

Keywords: Obstructive sleep apnoea (OSA); positive airway pressure; experience; metasynthesis

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Statement of Significance

This literature review provides a unique and comprehensive synthesis of the voices of people who use positive airway pressure (PAP) to treat obstructive sleep apnoea. The findings suggest that services can improve the, currently poor, use of PAP through:

- implementing a biopsychosocial approach
- improving awareness of obstructive sleep apnoea in primary care services
- investing in more positive experiences of obstructive sleep apnoea assessment and diagnosis
- providing trials of different PAP equipment
- reducing the cost of PAP to the individual
- providing sufficient information alongside ongoing, coordinated, person-centred support and review
- involving the person and significant others in decisions and goals around PAP
- introducing new PAP users to existing users

The synthesis also highlights avenues that warrant future research.
Experiences of Using Positive Airway Pressure for Treatment of Obstructive Sleep Apnoea: A Systematic Review and Thematic Synthesis

Obstructive sleep apnoea (OSA), the most common sleep-related breathing disorder, involves the upper airway repeatedly obstructing airflow during sleep. Estimated prevalence ranges from 1–19% for females, 2–33% for males, and up to 49% for people of advanced age. OSA is linked to serious physical, mental, cognitive and social difficulties and reduced sleep and quality of life for bed partners. Many cases are believed to go unrecognised, and prevalence is increasing as obesity is a significant risk factor. It is considered that untreated OSA doubles healthcare expenses, largely due to increased cardiovascular risk. Effective treatment is crucial to reducing the individual and societal impacts. However, evidence suggests that substantial barriers to effective treatment exist which psychological understandings may help address.

Positive airway pressure (PAP or CPAP for continuous) is the first-line treatment for OSA. Recent developments include bilevel (BiPAP), auto-adjusting and flexible PAP. All involve connection to an air supply, covering at least the nostrils and sometimes mouth, to keep the airway inflated overnight. PAP can significantly reduce symptoms and improve health outcomes for people with OSA. However, whilst prescribed usage is at least 4 hours every night, it is estimated that 46–83% of users do not achieve this, referred to as a lack of “adherence” and/or “compliance”. These usage rates haven’t changed since the introduction of PAP in 1981, presenting a significant challenge to effective OSA treatment.

Many variables have been identified as operative in PAP adherence. Much research focuses on biomedical factors and has linked usage with body mass index, OSA severity, age and blood oxygen levels. Meanwhile, some research has established links with psychological factors such as health value and beliefs, self-efficacy, coping strategies, low mood and perceived partner support. Further research has also found lower PAP use to be associated with ethnic minority status, less education, lower socioeconomic status, living alone, and employment. PAP side effects, such as mask leakage, nasal stuffiness and
feeling claustrophobic, also affect use. The breadth of variables found to account for the variance in PAP use exemplifies the need for a biopsychosocial understanding.

Previous reviews have proposed a biopsychosocial approach, advocating holistic assessment and a person-centred approach to identifying and addressing risks for sub-optimum use. There has been a more recent focus on person-centred care and the development of educational and supportive interventions to improve PAP use. Despite the suggested efficacy of these interventions, few have progressed beyond research trials, likely due to feasibility and cost. Thus, further understandings of the user experience of PAP may facilitate establishing feasible and cost-effective interventions. A review concluded that user perspectives within the literature are minimised by medical research paradigms of “compliance” as the ultimate outcome measure, placing users in a non-expert position and silencing their experiences. This review reflected the dominance of quantitative methodology around experiences in the PAP literature and recommended further exploration of qualitative user experiences to determine how PAP use can be improved.

Therefore, a systematic review and metasynthesis of qualitative research detailing first-person experiences was conducted to explore what people’s reported experiences are of using PAP. To the authors’ knowledge, this is the first metasynthesis of its kind. Synthesis of qualitative experiences make important contributions to healthcare innovation and policy. This review aimed to increase awareness of PAP users’ experiences to help understandings of how to support PAP use.

Method

This review followed The Preferred Reporting Items for Systematic Reviews and Meta-Analyses and Enhancing Transparency in Reporting the Synthesis of Qualitative Research guidelines. The protocol was pre-registered on PROSPERO (CRD42020157767).

Metasynthesis

A metasynthesis involves collating and further interpreting qualitative findings on a topic from multiple sources. Thematic synthesis is a method of metasynthesis which utilises the principles of
thematic analysis to achieve these ends. This metasynthesis was informed by pragmatism where the contribution of research to improving healthcare and people’s lives is prioritised over other considerations. Thematic synthesis was developed to answer healthcare questions and can be used to synthesise qualitative findings generated from different methodologies and epistemologies. This inclusive methodology was befitting to the review’s multidisciplinary scope.

Search

The first author independently searched PsycINFO, MEDLINE, CINAHL and EMBASE databases from inception on January 16th 2020. The Population, Exposure, Outcomes framework (a tool for generating systematic search terms), papers found through a scoping search, and relevant previous systematic search terms informed pre-planned free-text search terms. Free-text terms and any relevant thesaurus terms for each PEO framework category were combined with Boolean operator “OR” and these groups were combined with “AND”. Table 1 depicts the full search used in MEDLINE alongside differing database-specific thesaurus terms and limits. Due to being the first review of its kind, no date limits were applied. The search strategy was developed in consultation with a subject-specific librarian.

Eligibility

Primary research papers reporting first-person qualitative experiences of adults (aged 18 or older) using PAP to treat OSA were included. As the first review of its kind, experiences were limited to adult users and accounts from adolescents, caregivers and partners were not included. Included papers must have used an inductive analytic method as thematic synthesis involves further inductive analysis, meaning prior assumptions, theories or hypotheses from deductive methodology could bias the results. Papers also had to be in English and published in a peer-reviewed journal. Papers were excluded if (i) other participants (e.g. partners) contributed data and these findings were not separable; (ii) participants had additional health concerns/needs that are not typical of people with OSA and (iii) discourse analysis was used such that the results focussed on the language used rather than the experiences. Any ambiguities that arose during the application of these criteria were discussed between the authors to agree a decision in
keeping with the aim of the review: to be as comprehensive as pragmatically possible, given that it is the first review of its kind.

**Appraisal**

Papers were appraised by the first author on their contribution to answering the research question using the Critical Appraisal Skills Programme [CASP] Qualitative Checklist. Aligning with the proposed methodology for thematic synthesis, answers of “yes” to the CASP checklist beyond the screening items were considered “1 point”, generating a “hierarchy of evidence” and determining each paper’s “value”. Therefore, the CASP checklist was revised to omit the question, “how valuable is this research?”. The “hierarchy of evidence” was used to monitor the contribution of differently appraised papers to the review findings. The appraisal of a random subset of three papers was peer-reviewed by a trainee clinical psychologist.

**Data Extraction and Synthesis**

Data extraction and analysis were conducted in keeping with thematic synthesis methodology. All papers were entered into QSR’s NVivo 12 software. The first author selected all content under “findings/results” within each paper and novel findings or interpretations presented elsewhere (e.g. discussion).

The first author coded selected content inductively following Braun and Clarke’s principles of thematic analysis. After familiarisation with the data, initial codes were generated. These codes were then grouped based on meaning to create themes, which were reviewed, re-organised and named to best represent the original data. All papers were included equally in this process, regardless of their quality appraisal score. However, the “hierarchy of evidence” was consulted to ensure final analytical themes did not predominantly rely on data from more poorly appraised papers, as in this case, themes would have been collapsed and reorganised to incorporate data from more strongly appraised papers. Analytical themes were generated by “going beyond” the individual papers’ findings to answer the review question with novel interpretations that were only possible through the collective analysis of all the papers. NVivo file available upon request.
Reflexivity

Prior to analysis the first author noted that they had no personal experiences of PAP or close relationships with anyone who had. However, repeated readings of negative experiences during the literature search had informed an expectation to read further negative experiences. The author was mindful of this when conducting the metasynthesis. Meanwhile, whilst the data was coded inductively and every attempt made to ensure themes “kept close” to the original data, the first author was concurrently training and working as a clinician using a biopsychosocial approach. The process and emerging themes were discussed in supervision to minimise the influence of such potential biases on the results, although it is recognised that subjective bias can never be entirely eliminated from reviews of this kind.

Results

The search retrieved 6398 papers; 586 were duplicates. Titles and abstracts were reviewed against inclusion/exclusion criteria, eliminating 5,714 papers, and then a further 78 through full text review (eliminated papers largely reported on entirely quantitative research or were narrative reviews; see Figure 1). Five papers were identified through “snowballing” and “reverse snowballing”, which involved searching the reference lists of, and papers that had cited, the 20 inclusion papers retrieved from the systematic search.

Table 2 summarises the 25 inclusion papers. Papers S1-S3 reported on one dataset, as did V1 and V2. Supplementary material available with paper E was included. Table 3 details the critical appraisal outcome. The papers reported on over 398 people’s experiences from across the world, but largely from Western cultures (see Table 2). Experiences were synthesised into 2898 codes and sorted into four analytical themes: Journey to PAP, Discomfort from and around PAP, Adapting to and using PAP, and Benefits from PAP. These themes are explored with supporting direct quotations from participants. Table 4 shows the papers that contributed to each theme.

Journey to PAP – The Context Into Which Diagnosis and PAP Must Be Assimilated
People’s experiences of PAP were relative to their experiences with OSA. Journeys to learning about and acquiring PAP were often difficult and long.

**Difficulties Before PAP**

Prior to PAP, participants’ fatigue impacted their social life, relationships, mood, and functioning. Some slept poorly and disturbed bed partners. Apnoeas could be traumatic and stressful for the whole family. Similar symptoms affected participants differently but difficulties motivated participants to seek help.

**Delays to Getting Treatment**

A lack of public and professional awareness caused delays. Participants received misdiagnoses and misattribution of their fatigue, “The answer I got was: ‘It is because you are going to an all girl school.’” (P, p.187). General Practitioners’ unawareness made sleep service referrals inaccessible and only possible through specialists. Services also felt inaccessible due to long waiting times, no transparent funding routes, and existing tiredness.

Participants were also largely unaware of OSA. Snoring was embarrassing to talk about, particularly for females, and OSA was difficult to recognise without the testimony of loved ones. Some people denied having a problem due to the stigma of snoring and being overweight, not believing others or avoiding the consequences, “I don’t need a doctor, I don’t need to bill this to my insurance.” (I, p.53). Some participants suffered for up to 30 years and were often encouraged to seek help by others.

**Experiences of Assessment and Diagnosis**

Some participants found their referral and assessment satisfactory. Others were too uncomfortable on their diagnostic night to sleep much, and felt staff lacked skills and confidence, which made them question their diagnosis. The OSA diagnosis was a surprise for some and experienced as threatening, “He [the MD] really scared me.” (M, p.1240). Despite fears, taking on PAP was not a decision made lightly and sometimes partners influenced choices. Some people struggled with the trial and recommended that a better fitting mask and humidifier would increase comfort.
Discomfort From and Around PAP – Affects Relationships, Generating More Discomfort and Affecting PAP Use

The discomfort accompanying PAP affected multiple relationships, including the users’ relationship with PAP.

Relationship With PAP

PAP was described as uncomfortable. The mask was a common complaint due to poor fit and difficulties adjusting, resulting in noisy air leaks. “The first six months or so was challenging. . . (…) it was all to do with the masks” (S1, p.375). The straps, tube and pressure were also uncomfortable; some felt hot or unable to breathe. PAP was described as a foreign body unable to synchronise with the human body, “like having a Hoover on backwards and someone's shoved the hose in your mouth.” (S3, p.8). Whilst some participants persevered, some removed PAP during the night due to discomfort and others discontinued altogether.

PAP negatively impacted users’ bodies, causing dry/sore/bleeding airways, congestion, irritated eyes, aerophagia, facial sores/swelling, and back pain. Meanwhile, PAP was reported to be more uncomfortable psychologically. Fears of the machine and mask, being unable to breathe and claustrophobia were barriers. Participants also felt foolish and humiliated by PAP.

PAP was not an ideal solution, especially as participants were already struggling with OSA symptoms, “[The diagnosis] didn’t bother me all that much until I got the machine” (K, p.1725). Some desperately sought alternative solutions, “If there were anything that could be done to be free of that machine, I’d do it right now” (I, p.54). Participants were reluctant to accept a lifelong solution over a cure and expressed anger at the medical profession for not developing something better.

PAP was not always felt to be worth the discomfort and was abandoned, “It’s a no-win battle.” (I, p.54). Some hoped that PAP would reduce symptoms and improve quality of life. However, some did not experience this benefit, or not to the extent they had imagined or experienced from the trial. Others were conflicted; some were unsure of the benefit or their need for PAP and found reasons not to use it. Others
struggled to accept the device, experiencing a “love hate relationship” (H, p.145), or were grateful for the benefits but not happy with PAP, despite feeling they shouldn’t complain.

**Relationship With Life**

The addition of PAP was “extraordinarily intrusive” (B, p.233), impacting on both users and partners. Cleaning PAP was described as “a pain in the butt” (D, p.245). The necessary daily ritual was an obstacle to every day life; participants missed being able to just “go and jump into bed” (G, p.117) and fall asleep reading. The mask was annoying to apply and reapply if the user got up in the night.

Difficulties travelling with PAP restricted freedom. Users have to consider transporting PAP safely and accessing a compatible electricity supply. Some people avoided moving PAP, reducing their independence.

Lastly, PAP is expensive. For some, the cost exceeded their average monthly salary. Participants were “burdened” (J, p.274) by the expense and lack of support from insurance and public health systems. Having to consider the cost of replacing the device if necessary further reduced financial freedom.

**Relationship With Self**

PAP required users to adapt their identity, often towards one they stigmatised. For some, they shifted towards feeling disabled. The lifelong support was likened to a prosthesis or assistive technology, making OSA a visible disability. The lifelong nature also made participants feel old and unwell. Some knew older people who used PAP. The device resembled hospital equipment and wearing it at home felt like losing control as a submissive patient, “Makes you think I am sicker, in the ER or a nursing home” (U, p.7). Others struggled to identify as having OSA due to perceptions that OSA only affects overweight men. Women reported feeling less feminine due to snoring and PAP, “we’re supposed to be dainty when we sleep” (I, p.54).

PAP users felt unattractive in the bedroom, a place where some wished to feel desirable. Others “felt ashamed” (L, p.77) or “ridiculous” (F, p.247) and angry with themselves for needing PAP. Moreover, they
felt guilty for unconsciously removing PAP during the night, forgetting, or struggling to use it, “I tried and tried and I just couldn’t make the grade.” (H, p.145).

**Relationship With Others**

Users described being embarrassed and caring what others thought, especially partners, “I have to make sure that all the lights are off, (…) It makes me very, very uncomfortable” (B, p.233). Users worried PAP made them scary or unattractive, “You don’t start a relationship with somebody because of the CPAP.” (E, supplementary material). PAP impeded intimacy and co-sleep with bed partners, deterring use, “It’s had an impact on our relationship; you’ve got a frickin’ snorkel thing across your marriage bed” (I, p.54). Some users “didn’t want anybody to see” (Q, p.323) and kept PAP secret. Others shared their PAP use but experienced stigma and ridicule, feeling they had to join in the mockery of themselves to fit in.

**Relationship With Sleep**

Some participants felt PAP prevented sleep from being a “refuge from the burden of life” (V2, p.232). For some this was because it is “not natural to wear something to sleep” (J, p.273) and “proper sleep” (S3, p.7) could only be achieved without the restrictions of PAP. PAP also demanded a different sleeping position and sometimes interrupted rather than improved sleep, “I spend a lot of my night doing these little adjustments” (A, p.662).

**Adapting To and Using PAP – A Journey Not Destination**

This theme illustrates the journey of adapting to PAP and how support is crucial.

**Importance of Support and Information**

Reports illustrated the importance of professional and personal support to adapting to PAP. The benefit of contact with the PAP community was similar across different opportunities. Participants felt part of an encouraging community whilst they learned from others’ experiences and had their difficulties normalised. Experienced users wished to help others, “I would really like to be part of something that might prevent other people from going through what I have” (P, p.189) and did so through being a role model,
promoting PAP, and encouraging self-advocacy, “Don’t feel that it’s your fault. Get it straightened out” (G, p.118).

Some participants found support came from people around them. Working “together as a couple” (U, p.5) to integrate PAP, absence of a negative reaction, and reassurance was described as helpful. Others described a lack of encouragement, assistance and support as being barriers to use, alongside conflicted priorities and partner scepticism, “It’s not easy to counter the effect of your wife saying, ‘[CPAP] is not going to work for you!’” (B, p.233).

Helpful professional relationships involved trust, consideration and dependability. Participants stressed the benefits of a straightforward accessible process, ongoing support, sufficient information, and “the possibility to try the CPAP at the hospital.” (E, supplementary data). This support provided relief and facilitated acceptance and integration of PAP. Information on both OSA and PAP was reported to be powerful in equipping people, “gave me a strong motivation and I think I was comfortable and well prepared to meet all possible problems.” (D, p.108).

Individualised care and sufficient provision were commonly lacking. Participants struggled to use PAP without information on OSA, PAP and how to access support. Follow up support was often unavailable or inaccessible due to working hours and staff availability. Some found providers unknowledgeable, which led some to view PAP as “just another way for the medical establishment to make money.” (P, 188).

“When I first went to get the machine, unfortunately it’s a salesman talking to you…. So I had to sit and listen to an hourlong sales spiel…. I’m going—okay just tell me how to use the machine…. I didn’t even get a manual. I called a few times, and they had to call you back because they are salespeople; you get lost and overlooked.” (F, 246)

Meanwhile, some insurance companies were unwilling to pay for PAP creating the impression that some people “just have apnoeas and die” (H, p.143). Participants felt alone and unable to request help. Users recommended that services be personalised and provide more information, coordinated care, and a chance to try different equipment. Follow up support was deemed necessary for empowerment and assistance with
inevitable difficulties, “I wanted to know how I was doing. (…) why doesn’t somebody call me and say, ‘You’re doing pretty good, lady. You’re keeping this thing on for eight hours.’” (L, p.78).

**Effort Necessary to Adapt**

Adapting to PAP was described as “trial and error” (S1, p.375). Trialling the benefits, creative problem solving and “learning by doing” (M, p.1240) occurred in the absence of professional support. Some users sought additional information on PAP through online research, support groups and family and friends. Users became experts in their own care by learning how to maintain, adapt and repair their machines, monitor their OSA and self-advocate, “I am battling the insurance company because they are saying I shouldn’t have one [CPAP].” (F, p.247).

PAP required compromise. The home environment was adapted; from buying a bedside table to drilling a hole in the wall so the machine could live in the next room. Users’ bodies also had to compromise: “I trained myself to sleep on my back and hold the hose with my left hand so it doesn’t move.” (G, p.118). Meanwhile, partners had to compromise alongside users, “This hoover-head made the wrong choice buying a bed. (…) We literally wake up sore in the morning!” (O, p.106).

Users also had to “stay with it.”(G, p.118). Perseverance was important to grow accustomed, time is required to establish PAP as routine, “Persevere for a while, and then you'll get used to it and then you won't ever want to be without it.” (S3, p.8).

**Attitude, Belief and Context**

PAP use was initially influenced by mindset but then by the journey of adaptation. Acceptance seemed key to use, mostly through accepting the compromise, “hideous, but you feel more hideous if you don’t use it.” (S1, p.375). Some accepted the compromise through “relief that we were finally going to get something done” (C, p.226). Others were desperate and willing to do and “pay for anything that would help.” (A, p.664). Some reported to “accept it [the CPAP] with love.” (V2, p.230) and encouraged others’ acceptance by telling them about PAP, “I’m not ashamed anymore, (…) I tell as many people as I can” (C, p.226).
Humour was depicted to buffer some discomfort, “My grandchildren have seen me in mine, and I’m not the slightest bit worried...I gave them very clear instructions about ‘grandpa’s elephant nose!’” (H, p.145). This buffering perhaps resembles acceptance, but it might be unhelpful for some, “he tries to make light by cracking jokes, but it doesn’t necessarily make me feel any better” (S2, p.85). Avoidance over acceptance seemed a barrier to use. Some participants felt their OSA wasn’t as bad as others’, that losing weight would be better than PAP, or were sceptical about PAP’s importance, “you just think of it as a snoring thing. You don’t think of it as, I’ve got cancer and I’m going to die” (Q, p.322).

Some believed in PAP, “I was sure that it should work, and it does.” (E, supplementary data) and others were committed regardless, “there was no way around it, it was just getting on with it” (M, p.1240). Many used PAP as protection from negative social, vocational or physical health consequences, such as losing their driver’s license. Others were not motivated for themselves but wanted to benefit others, “If you love her [the partner], use it.” (U, p.7). Positivity, confidence, and the users’ belief in their abilities also helped PAP use. Ultimately, context influenced users’ motivations and attitudes, which were susceptible to change.

**PAP Use a Journey Not Destination**

Participants portrayed PAP use as an evolving relationship, not an end to suffering. Most papers reported all early experiences to be difficult, regardless of outcome. PAP use was a battle not always won. Some participants had managed to grow accustomed to PAP despite challenges, and some were still struggling. Even after the battle, PAP use was fluid not fixed; even committed users reported exceptions, “If I am going someplace special, I will just not wear it that night.” (F, p.247). Others seemed uncertain about their commitment and deciding daily felt more comfortable than lifelong commitment. Few people were fully satisfied with PAP. Users described continually evaluating their compromise and potentially changing their minds. Non-users also reported ambivalence, with some reporting big fluctuations in their usage over time.
Meanwhile, PAP experience changed over time. Small changes for the user or machine affected the relationship. Changes in PAP due to repair or replacement required a process of readjustment. Meanwhile, “so many different issues” (H, p.145) affected sleep. Changes in peer group opinion and other health conditions also impacted use. Assessment of ongoing needs was indicated; the benefits of PAP receded for some whilst others were unsure of their continued need for PAP after losing weight.

However, PAP was sold as a destination rather than a journey. Device settings were fixed and not reviewed. As bodies are not fixed entities, users tried to adjust their equipment to fluctuating needs and struggled to use devices that no longer helped. Usage was monitored but not users’ experience or mental wellbeing, “I have to send it [compliance card] to make sure you use it like a big brother; I don’t like being watched.” (F, p.247). Even the information provided portrayed a ‘one size fits all’ solution:

“there wasn’t a lot of personal stuff in there, like people that have actually used machines. So when I was on the net I was just basically looking at people’s experiences with the machines and their own journeys with it.” (Q, p.322)

Participants proved largely autonomous in their care, wished to be more involved in treatment decisions and wanted to work towards personal goals rather than optimal usage, “We [people with OSA] cannot be pigeonholed. Each of us has to be looked at as an individual.” (P. p.191).

**Desired Outcomes**

Some participants described PAP becoming “a ritual and a new normality, almost like brushing your teeth” (M, p.1240). This seemed a comfortable position, suggesting some users may reach a desirable destination. Some reported, “there aren’t really any difficulties with the machine. It’s really too easy.” (B, p.233). This report’s contrast to others highlights how influential context is, and perhaps how an easy PAP experience is expected, “I don’t understand anybody that doesn’t do good on it because it makes you feel so much better.” (K, p.1726).

**Benefits From PAP – Engender Motivation and Positive Relationships With PAP**

Most papers reported benefits that motivated use and facilitated a positive relationship with PAP.
**PAP Effects on OSA**

PAP relieved snoring, apnoeas and daytime sleepiness, bringing OSA “under control” (S1, p.374). Participants described a better quality of sleep that was more satisfying and refreshing for them and their partners, “Now in the mornings, it’s so much easier to get up” (L, p.77). Some hadn’t fully appreciated their symptoms before and noticed a real difference when they didn’t use PAP. Users felt more alert, “I’m safe on the road now” (Q, p.323) and energetic which helped them reduce lifestyle contributors to OSA, “I’m in the gym, losing weight” (C, p.225).

**PAP Effects on Wider Life**

The benefits generated a “better quality of life” (U, p.5). It was “nice to be able to go to places and not have to worry about falling asleep.” (B, p.233). Physical and psychological wellbeing improved. Participants reported feeling less irritable and anxious and more “able to relax” (T, p.169). Some felt PAP had returned them to their former selves. PAP reportedly “helps the whole house” (C, p.225) through improving sleep, mood and relationship quality. Some couples were able to sleep in the same room again.

**Relationship of Improvements to PAP Use**

Benefits motivated use, “you get a much better life.” (M. p.1240). Some experienced immediate and notable differences, “I haven’t felt this good in years. It was like night and day; it saved my life.” (G, 117). Maintaining PAP use was harder alongside subtle improvements, unless these matched expectations, “I wanted to keep trying because he had told me it might take a while, and then I did notice gradual changes.” (F, p.246).

**Bonded to PAP**

Different bonds motivated PAP use. Some reported to “depend on it” (J, p.276) and would take it when travelling. PAP was trusted to keep users well and provided a sense of hope, “I feel so secure with it” (C, p.225). Others found PAP “soothing” (K, p.1728) and felt thankful for the benefits.

**Discussion**
The findings highlight the applicability of a biopsychosocial understanding to PAP use and the importance of individualising treatment to suit the user. The theme “Journey to PAP” depicts biological influences. Participants largely struggled with OSA symptoms but had difficulty obtaining the diagnosis or wouldn’t seek help; consistent with findings of an average of up to ten years between symptom onset and diagnosis. Limited public and professional awareness presented a barrier. Findings suggest symptom severity influences PAP use more than OSA severity. Perhaps people experiencing greater symptoms are more motivated to overcome barriers to acquire and use PAP.

The theme “Discomfort from and around PAP” emerged from prevalent reports that PAP generates psychological as well as physical discomfort, impacting use. PAP use required an often-uncomfortable shift in identity, generating stigma from individual and cultural prejudices, highlighting the importance of understanding the personal experience of PAP. Older age is associated with PAP use, potentially reflecting higher acceptability of lifelong treatment in later life. The stigma experienced by PAP users from themselves and others is not well documented and warrants further research as stigma is known to impact other treatments.

People who have not tried PAP report wanting to avoid reliance. However, users depicted dependence as a positive bond within “Benefits of PAP”, highlighting the role of psychological factors such as attitude and belief within “Adapting to and using PAP”. Early attachment patterns may influence relationships with healthcare services and may similarly affect relationships with PAP, perhaps explaining why dependence is soothing for some and avoided by others. Such psychological influences on PAP use are conceivably complex and require further research.

Benefits were infrequently reported and highlighted the influence of expectation. Some experienced drastic changes from PAP use, which outweighed any discomfort experienced. It is possible that these ideal yet infrequent experiences have informed expectations. Subtle changes were less motivating, highlighting the importance of realistic expectations and ongoing professional input.
The users’ social context was also reported to affect PAP use. Support was overwhelmingly cited as important. Most accounts suggested that services provided little initial and ongoing support, meaning PAP use relied on the individual or their personal networks. Information on OSA and PAP emerged as crucial. Research suggests that professionals underestimate the importance of information and overestimate the impact of side effects. These findings suggest that professionals may overemphasise discomfort at the expense of other information, potentially increasing user experience of discomfort through confirmation bias. Moreover, it may reflect professional beliefs, similar to the current findings of user frustration, that PAP is not an ideal solution and warrants further research.

Some included studies enabled participants to connect with other users. Group sessions were recommended as helpful whilst experienced users wanted to help others use PAP. Connecting users is an inexpensive way for services to provide ongoing support. Moreover, the benefit reported of involving people around the user in PAP treatment, particularly considering their role in initially recognising OSA, supports other findings. Again, it is a low-cost solution to utilise existing support networks. Meanwhile, it may provide services the opportunity to understand and mitigate personal relationship difficulties that the current findings, alongside others, suggest hinder PAP use.

However, services should not rely on personal networks to support users. Although personal support was largely reported as readily available, participants’ PAP usage was still reported as suboptimal, suggesting sufficient professional support is also imperative. The findings also suggested that PAP is sold to users as a destination whilst user experiences conveyed a lifelong journey that is especially difficult in the early stages. To assist this journey, participants described needing ongoing support and wanting to share decision-making, goals and monitoring around their treatment. The focus on objective PAP use was experienced as impersonal and unhelpful.

The needs highlighted here match The World Health Organisation’s 2003 recommendations on working collaboratively with people and their families to support long-term treatment use. The recommendations detail that users should not be blamed for non-optimal use and that service level factors,
such as absent personalised holistic ongoing support, have a major effect. However, the PAP literature continues the user blaming narrative, despite the emergence of research discrediting focus on objective measures of use \(^{89-91}\). PAP use is considered an important challenge to sleep medicine and the utility of OSA as a diagnosis, making investment towards supporting PAP use crucial \(^{92}\).

Given the reported role of acceptance, it is also thought that Acceptance and Commitment Therapy (ACT) \(^{93}\) principles may help contextualise PAP use as supportive of user values. Whilst not the only intervention that can facilitate acceptance, ACT is an evidence-based biopsychosocial approach used to support management of other long-term conditions \(^{94}\). However, as PAP use is an individual, context dependent, lifelong journey, no supportive or educational interventions will likely be effective for all PAP users at once. Instead, users may benefit from a range of support across their lifetime. Therefore, PAP services should expand the information and support available, making use of a range of evidence-based interventions \(^{52-55,95,96}\) and facilitate collaborative decisions, goals and monitoring between professionals, users and their networks \(^{97}\).

Despite reflexive efforts to reduce bias within the findings and interpretations, all systematic reviews contain bias \(^{72}\). Seven papers contained translated experiences, increasing opportunities for misunderstanding and misrepresentation. Additionally, some findings may be country specific. Many papers had only recruited current PAP users, potentially reducing the inclusion of more difficult experiences of PAP. Meanwhile, the current review excluded narratives of significant others. Based on the reported role of others in recognising OSA and supporting PAP use, future research is recommended to include these perspectives to corroborate and enhance the current understandings. Future research is also necessary to build on the current findings, particularly the ‘thinner’ themes.

This metasynthesis hoped to address the absence of user’s voices within the PAP literature. The findings support a biopsychosocial conceptualisation of PAP use and highlight the limitations of the literature’s emphasis on individual factors. Collaborative, person-centred and holistic ongoing support is needed to improve PAP use.
References


73. Sayers A. Tips and tricks in performing a systematic review. *Br J Gen Pract*. 2007;57(542):759. doi:https://doi.org/10.3399/bjgp08X277168


List of Figures and Figure Titles

Figure 1

*PRISMA Flow Diagram* \(^{59}\)
List of Tables in Order of Reference in the Paper

Table 1

Full Search Strategy for MEDLINE Database and Database Specific Alternatives

<table>
<thead>
<tr>
<th>Database: MEDLINE</th>
<th>Search fields</th>
<th>Free text keywords</th>
<th>MeSH terms</th>
<th>Limits applied</th>
</tr>
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<tbody>
<tr>
<td>Population</td>
<td></td>
<td>sleep apnoea OR sleep apnea OR OSA OR hypopnoea OR hypopnea</td>
<td>“Sleep Apnea, Obstructive”</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OR</strong></td>
<td><strong>AND</strong></td>
<td></td>
</tr>
<tr>
<td>Exposure</td>
<td></td>
<td>positive airway pressure OR CPAP OR BiPAP OR (obstructive sleep apnoea OR OSA) N4 (treatment) OR (obstructive sleep apnea OR OSA) N4 (treatment)</td>
<td>“Continuous positive airway pressure”</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>OR</strong></td>
<td><strong>AND</strong></td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td></td>
<td>experience* OR preference* OR report OR perspective* OR perception* OR influence* OR barrier* OR facilitator* OR acceptance OR choice* OR attitude* OR adapt* OR cop* OR point of view* OR opinion* OR qualitative OR narrative* OR grounded theory OR focus group OR theme* OR thematic</td>
<td>“Treatment Adherance and Compliance+”</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Database specific alternatives to above search strategy</th>
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<tbody>
<tr>
<td>PsycINFO</td>
</tr>
<tr>
<td>$P$: “Sleep Apnea”</td>
</tr>
<tr>
<td>$E$: None</td>
</tr>
<tr>
<td>$O$: “Client Attitudes”</td>
</tr>
<tr>
<td>Journal article, English language</td>
</tr>
<tr>
<td>Human</td>
</tr>
</tbody>
</table>

| CINAHL                                                  |
| $P$: “Sleep Apnea, Obstructive”                        |
| $E$: “Continuous Positive Airway Pressure”             |
| $O$: “Patient Satisfaction+” OR “Patient Compliance+”  |
| Journal article, English language                      |
| Human                                                  |

| EMBASE                                                  |
| $E$: “exp positive and expiratory pressure”             |
| $O$: “exp patient attitude” OR “exp patient compliance”|
| Article                                               |
| English language                                      |
| Human                                                 |

* denotes a truncation

+ indicates where a term was exploded
## Table 2

Details of Papers Included in The Metasynthesis, Listed in Alphabetical Order

<table>
<thead>
<tr>
<th>Assigned letter</th>
<th>First author</th>
<th>Year</th>
<th>Location</th>
<th>N</th>
<th>Sex</th>
<th>Average age (range)</th>
<th>Average AHI</th>
<th>Average BMI</th>
<th>Method of data collection</th>
<th>Method of qualitative analysis</th>
<th>Primary research question(s)</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Almeida</td>
<td>98</td>
<td>Canada</td>
<td>22</td>
<td>13</td>
<td>60 (Not stated)</td>
<td>17.8 - 29.1</td>
<td>Not stated</td>
<td>Focus groups</td>
<td>Thematic analysis</td>
<td>What are the experiences of CPAP and oral appliance users? What are the factors that influence a patient’s choice of treatment?</td>
</tr>
<tr>
<td>B</td>
<td>Ayow</td>
<td>99</td>
<td>Canada</td>
<td>8</td>
<td>4</td>
<td>43.3-48.8 (Not stated)</td>
<td>43 – 45.2</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Thematic analysis</td>
<td>What are the perceived factors that facilitate CPAP use? What are the perceived factors that prevent CPAP use and lead to abandonment of treatment?</td>
</tr>
<tr>
<td>C</td>
<td>Bakker</td>
<td>100</td>
<td>New Zealand</td>
<td>18</td>
<td>11</td>
<td>47 (30-71)</td>
<td>59.1 - 93</td>
<td>Not stated</td>
<td>Focus groups</td>
<td>Thematic analysis</td>
<td>What are Maori, Pacific and New Zealand European patients’ experiences with CPAP treatment?</td>
</tr>
<tr>
<td>D</td>
<td>Broström</td>
<td>101</td>
<td>Sweden</td>
<td>1</td>
<td>1</td>
<td>33</td>
<td>92</td>
<td>40</td>
<td>Semi-structured interview</td>
<td>Phenomenographic</td>
<td>What are the experiences of CPAP treatment of a young male with severe OSA from the couple’s perspective?</td>
</tr>
<tr>
<td>E</td>
<td>Broström</td>
<td>102</td>
<td>Sweden</td>
<td>23</td>
<td>13</td>
<td>59-62 (33-74)</td>
<td>40-44</td>
<td>34-35</td>
<td>Semi-structured interviews</td>
<td>Content analysis</td>
<td>What are the in-depth experiences associated with adherence to CPAP treatment in patients with OSA?</td>
</tr>
<tr>
<td>Author</td>
<td>Year</td>
<td>Country</td>
<td>ID</td>
<td>Gender</td>
<td>Age</td>
<td>Not stated</td>
<td>Method</td>
<td>Analysis</td>
<td>Research Questions</td>
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<tr>
<td>F Dickerson</td>
<td>2007</td>
<td>USA</td>
<td>20</td>
<td>9 male</td>
<td>52.8 (31-72)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Heideggerian hermeneutics</td>
<td>What are the experiences of individuals with sleep apnoea who use CPAP devices from diagnosis to 3 months? What is the usefulness and appropriateness of the Calgary sleep apnea quality of life (SAQOL) measurement tool?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G Dickerson</td>
<td>2006</td>
<td>USA</td>
<td>17</td>
<td>12 male</td>
<td>58.4 (40-73)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Heideggerian hermeneutics</td>
<td>What are the support group experiences of individuals with OSA who uses CPAP devices?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Gibson</td>
<td>2018</td>
<td>New Zealand</td>
<td>16</td>
<td>15 male</td>
<td>71 (67-89)</td>
<td>Not stated</td>
<td>Focus groups</td>
<td>Thematic analysis</td>
<td>What is the experience of diagnosis and management of OSA for older patients? What are the factors affecting acceptance of the current New Zealand services?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I Henry</td>
<td>2013</td>
<td>USA</td>
<td>12</td>
<td>7 male</td>
<td>49.3 (27-72)</td>
<td>57</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Content analysis</td>
<td>What is the significance of gender and partner-reporting in shaping the lay diagnosis, management, and treatment of OSA?</td>
<td></td>
</tr>
<tr>
<td>J Hu</td>
<td>2014</td>
<td>Taiwan</td>
<td>22</td>
<td>18 male</td>
<td>Not stated (37-68)</td>
<td>60.3</td>
<td>27.5</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What are OSA patients’ feelings and perceptions in dealing with CPAP therapy?</td>
<td></td>
</tr>
<tr>
<td>K Khan</td>
<td>2019</td>
<td>USA</td>
<td>28</td>
<td>12 male</td>
<td>58 (Not stated)</td>
<td>Not stated</td>
<td>Semi-structured motivational interviews</td>
<td>Thematic analysis</td>
<td>What are OSA patients’ preferences, partner experiences, barriers and facilitators to PAP adherence? What is the understanding of the educational content delivered and satisfaction with the multidimensional structured intervention?</td>
<td></td>
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<tr>
<td>L Luyster</td>
<td>2019</td>
<td>USA</td>
<td>15</td>
<td>9 male</td>
<td>Not stated (Not stated)</td>
<td>Not stated</td>
<td>Focus groups</td>
<td>Content analysis</td>
<td>What are both patients’ and partners’</td>
<td></td>
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<tr>
<td>Year</td>
<td>Country</td>
<td>Study Title</td>
<td>Sample Size</td>
<td>Gender</td>
<td>Age Range</td>
<td>Study Method</td>
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<tr>
<td>2016</td>
<td>USA</td>
<td>Møkleby 2019</td>
<td>7</td>
<td>5 male</td>
<td>Not stated (36-76)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>How do patients with obstructive sleep apnoea experience and manage their use of CPAP?</td>
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<tr>
<td>2019</td>
<td>Norway</td>
<td>Møkleby</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Not stated</td>
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<td>Narrative analysis</td>
<td>What are suggestions for a new CPAP user program?</td>
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<td>UK</td>
<td>Moreira 2006</td>
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<td>Not known</td>
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<td>Analytic induction</td>
<td>What is the relationship between sleep and health from a sociological perspective?</td>
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<td>2008</td>
<td>UK</td>
<td>Moreira 2008</td>
<td>Not known</td>
<td>Not known</td>
<td>Not known</td>
<td>Online discussion group</td>
<td>Analytic induction</td>
<td>How do users establish and maintain workable relationships between CPAP and other technological elements of the domestic environment?</td>
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<tr>
<td>2014</td>
<td>USA</td>
<td>Rodgers 2014</td>
<td>82</td>
<td>53 male</td>
<td>52 (21-82)</td>
<td>Not stated</td>
<td>Interviews</td>
<td>Grounded theory</td>
<td>What are the experiences of individuals living with obstructive sleep apnoea?</td>
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<tr>
<td>2011</td>
<td>Australia</td>
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<td>15 male</td>
<td>57.5 (20-75)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Thematic analysis</td>
<td>What are the experiences of people with OSA, who have sourced their CPAP supply through a pharmacy?</td>
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<td>2000</td>
<td>Australia</td>
<td>van de Mortel 2000</td>
<td>19</td>
<td>15 male</td>
<td>54.8-65.9 (41-75)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>How do clients’ experiences of sleep studies affect their compliance with therapy?</td>
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<tr>
<td>Study</td>
<td>Ward</td>
<td>Year</td>
<td>Country</td>
<td>Sample Size</td>
<td>Gender</td>
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<tr>
<td>S1</td>
<td>77</td>
<td>2017</td>
<td>New Zealand</td>
<td>12</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What are experiences of living with continuous positive airway pressure?</td>
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<tr>
<td>S2</td>
<td>115</td>
<td>2018</td>
<td>New Zealand</td>
<td>12</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What is it like to live with CPAP for sleep apnoea?</td>
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<tr>
<td>S3</td>
<td>116</td>
<td>2019</td>
<td>New Zealand</td>
<td>12</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What are experiences of living with CPAP?</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>117</td>
<td>2012</td>
<td>Sweden</td>
<td>15</td>
<td>8 male</td>
<td>56.8 (41-71)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Content analysis</td>
<td>What are personal experiences with CPAP in individuals with moderate or severe OSAS and obesity?</td>
<td></td>
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<tr>
<td>U</td>
<td>118</td>
<td>2017</td>
<td>USA</td>
<td>20</td>
<td>14 male</td>
<td>49.6 (not stated)</td>
<td>24.1</td>
<td>Semi-structured interviews</td>
<td>Content analysis</td>
<td>What are couples’ experiences with CPAP treatment? What are the facilitators and barriers to incorporating CPAP use into daily life?</td>
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<tr>
<td>V1</td>
<td>92</td>
<td>2017</td>
<td>Israel</td>
<td>19</td>
<td>11 male</td>
<td>55.5-60.5 (not stated)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What are patients’ experiences of CPAP use and nonuse?</td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>82</td>
<td>2018</td>
<td>Israel</td>
<td>19</td>
<td>11 male</td>
<td>55.5-60.5 (not stated)</td>
<td>Not stated</td>
<td>Semi-structured interviews</td>
<td>Grounded theory</td>
<td>What happens to agency in the context of sleep? How is agency exchanged from body to technology in sleep?</td>
<td></td>
</tr>
</tbody>
</table>
Two averages are given when average age is presented for two separate groups (e.g. males and females), not the entire participant cohort.

Apnoea hypopnea index (AHI) is used as a measure of OSA severity, it indicates the average number of apnoeas (cessation of breathing) and hypopneas (partial cessation of breathing) for >10 seconds per hour of sleep. 5-14 is considered mild, 15-30 moderate and 30+ severe OSA.

A body mass index (BMI) of above 35 kg/m² is considered a risk indicator for OSA.

Table 3

Results of Critical Appraisal

| CASP Question                                                                 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S1 | S2 | S3 | T | U | V1 | V2 |
| Was there a clear statement of the aims of the research?                     | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Is a qualitative methodology appropriate?                                    | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Was the research design appropriate to address the aims of the research?    | 1 | 1 | 0* | 1 | 1 | 1 | 0* | 1 | 0* | 1 | 1 | 1 | 0* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0* |
| Was the recruitment strategy appropriate to the aims of the research?       | 1 | 1 | 1 | 1 | 1 | 0* | 1 | 1 | 0* | 1 | 0* | 1 | 1 | 0* | 1 | 0* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0* |
| Was the data collected in a way that addressed the research issue?          | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Has the relationship between researcher and participants been adequately considered? | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| Have ethical issues been taken into consideration?                           | 1 | 1 | 1 | 1 | 1 | 0* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Was the data analysis sufficiently rigorous?                                 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0* | 1 | 1 | 1 | 1 | 0* | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Is there a clear statement of findings?                                      | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
Note. A score out of 7 was assigned to each article based on the number of criteria it met beyond the first two screening criteria (which all articles met). No value was assigned for criteria where the answer was either “no” or “can’t tell”. 1 indicates an answer of “yes”, 0* indicates an answer of “can’t tell” and 0 indicates an answer of “no”.

Table 4

Contribution of Papers to Each Analytical Theme and Subtheme

<table>
<thead>
<tr>
<th>Theme/subtheme</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Journey to PAP</td>
<td>X</td>
</tr>
<tr>
<td>Difficulties before PAP</td>
<td>X</td>
</tr>
<tr>
<td>Delays to getting treatment</td>
<td>X</td>
</tr>
<tr>
<td>Experiences of assessment and diagnosis</td>
<td>X</td>
</tr>
<tr>
<td>Discomfort from and around PAP</td>
<td>X</td>
</tr>
<tr>
<td>Relationship with PAP</td>
<td>X</td>
</tr>
<tr>
<td>Relationship with life</td>
<td>X</td>
</tr>
<tr>
<td>Relationship with self</td>
<td>X</td>
</tr>
<tr>
<td>Relationship with others</td>
<td>X</td>
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<tr>
<td>Relationship with sleep</td>
<td>X</td>
</tr>
<tr>
<td>Adapting to and using PAP</td>
<td>X</td>
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<tr>
<td>Importance of support</td>
<td>X</td>
</tr>
<tr>
<td>Attitude, belief, and context</td>
<td>X</td>
</tr>
<tr>
<td>Effort necessary to adapt</td>
<td>X</td>
</tr>
<tr>
<td>PAP use a journey not destination</td>
<td>X</td>
</tr>
<tr>
<td>Desired outcomes</td>
<td>X</td>
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<tr>
<td>Benefits from PAP</td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>X</td>
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<td>Relationship of improvements to PAP use</td>
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