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Patient Perspectives on ADPKD

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Autosomal dominant polycystic kidney disease (ADPKD) is the most common inherited kidney disease. It has been associated with a significant physical and psychological burden, leading to a reduced quality of life. The purpose of this literature review is to summarize the patient perspective on ADPKD based on the current published literature. A systematic literature review was conducted in accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Publications reporting a patient or caregiver/relative perspective of ADPKD were included. Sources searched included Medline (PubMed), Embase (Ovid), Cochrane Library, and Web of Science from inception to April 2022. This was followed by a subsequent reference and citation search. A total of 1011 articles were identified by the search process, with 28 studies included in the review. An inductive thematic analysis identified six key themes: diagnosis, monitoring, and screening; symptoms; lifestyle and dietary interventions; psychological, physical, and social impact; future planning; and interaction with the health care system. The findings of this review highlight the burden and uncertainty associated with ADPKD from a patient's perspective. This impacts patients and their caregivers/relatives at each stage of the patient's journey from screening to initiation of renal replacement therapy and future planning.

Key Words: Polycystic kidney, Autosomal dominant, Patient-centered care, Health knowledge, Qualitative research

Autosomal dominant polycystic kidney disease (ADPKD) is the most commonly inherited kidney disease. It is a lifelong condition which may begin asymptomatically but ultimately progresses toward end-stage kidney disease.[1,2] Progressive symptoms, increasing medical input, and varied presentations can have significant physical, psychosocial, and economic impact on the individual with ADPKD, their caregivers, and families.[3] There has been an overall trend toward a more patient-centered clinical practice, clinical trials, and research.[4]

A patient perspective can be defined as the self-perceived impact of the health condition, health care journey, and treatment on the life of the patient as well as their families and caregivers.[5] It can encompass symptomatic, psychological, social, and spiritual aspects.[6] Understanding patient perspectives is important in the design of health care services, basic science research, and clinical trials to ensure they meet the needs of the ADPKD community.[7] This integration of patient perspectives has been shown to increase patient satisfaction with their health care provider as well as promote shared decision-making and better self-management.[8,9]

The aim of this review is to explore the published perspectives of adults with ADPKD regarding their experience of their condition and health care needs.

METHODS

A systematic approach to the literature review was chosen to ensure that the review synthesizes patient perspectives from a wide range of sources, maximizing recall and reducing publication bias. We conducted the review according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement 2020.[10] Studies were eligible for inclusion if they focused on the perspectives of people with ADPKD or their caregivers/relatives. No restrictions were placed on the research design or publication date. Results were restricted to the English language due to limited resources for translation.

The search strategy was developed using the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) framework for qualitative studies as the research question focused on patient perspectives, which are most likely to be found in qualitative studies (Table 1). To ensure that all forms of patient perspectives were captured by the search strategy, the PubMed search for patient perspectives recommended by the European Lung Foundation was used initially and then adjusted for the other databases.[11] Databases searched include MEDLINE via PubMed, EMBASE via OVID, Cochrane Library, and Web of Science from inception to April 2022. Full details of the search strategy can be found in Appendix 1.

Screening of titles and abstracts for published studies was performed by a single reviewer in EndNote 20 to facilitate duplicate removal. Full text of potentially eligible studies was subsequently reviewed to determine eligibility based on the SPIDER criteria. Data extraction was performed by a single reviewer in a consistent manner using a piloted form in Microsoft Excel. A thematic analysis was undertaken with an inductive approach to coding.

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RESULTS

Search Process

After eliminating duplicates, 1011 titles were identified from the multiple database searches. Fifty studies were selected for full-text review, and 28 were included in the thematic synthesis. The PRISMA flowchart summarizing the review process is shown in Figure 1.

Study Characteristics

Twenty-eight studies were included. This consisted of 12 questionnaires (42.9%), 6 reviews (21.4%), 3 interviews (10.7%), 3 focus groups (10.7%), 2 consensus exercises (7.1%), a letter to the editor (3.6%), and a mixed methods study (3.6%). The included studies were based in a wide range of countries including 10 from United States (35.7%), 5 United Kingdom (17.9%), 5 International (17.9%), 5 Europe (17.9%), 2 Australia (7.1%), and 1 China (3.6%).

Themes in Patient Perspectives

Six key themes were identified through the thematic analysis with 27 subthemes (Fig 2). These themes can be applied to the components of the conceptual framework for patient-centered care described by Hudon and colleagues (Fig 3).[12] The frequency of studies for each subject area is shown in Fig 4. A word cloud was generated to graphically display the different subject areas within each theme (Fig 5).

CLINICAL SUMMARY

- Autosomal dominant polycystic kidney disease is the most common hereditary kidney disease characterized by progressive cyst development and kidney failure.
- The varied nature of presentation between and within families is associated with considerable uncertainty for patients and their relatives, and this may influence a patient's experience of their illness from diagnosis and screening to end-stage renal disease and renal replacement therapy.
- Autosomal dominant polycystic kidney disease is associated with a high symptom burden, limited treatment options, and considerable associated physical, psychological, lifestyle, and social impact.

Diagnosis, Monitoring, and Screening

An early diagnosis of ADPKD has been reported to be beneficial by allowing patients to take control of their own health, make lifestyle/dietary changes, and start taking preventative medications earlier in their condition. It would also allow them to better prepare for the future in terms of managing their expectations, changing their lifestyles, considering financial responsibilities, arranging living donation, and family planning as discussed later.[13–16] However, a presymptomatic or early diagnosis could also lead to psychological distress through being informed of a diagnosis that does not have a clear prognosis including when they might reach kidney failure.[15] There are also potential consequences related to finances, life insurance, and career choices such as the military. In terms of genetic testing, there are potential concerns regarding testing children.[15,17,18]

In the case of presymptomatic ultrasound screening, concerns have been expressed that patients may feel falsely reassured if the implication of a "negative scan" has not been fully explained. There could be additional issues with the ultrasound diagnosis if the results are provided by the ultrasonographer or GP directly to the patient outside of the support normally provided in a renal department.[17,19]

Symptoms

Symptoms are often worse in cases of later disease after the age of 40 years.[20,21] Particularly burdensome symptoms from a patient's perspective include kidney- and liver-related pain, fatigue, and skeletal/joint pain.[22]

Pain is a common recurrent symptom, being described as intolerable, debilitating, unpredictable, and interfering with daily life.[23] Many patients feel powerless in managing pain or coping with pain. This is an area that patients want further research to develop more effective interventions as current therapies or management strategies remain inadequate.[1,19,21,24–26] This is supported by the recent BMJ publication on the top 10 UK research priorities for ADPKD where the sixth ranked priority was research into treatments that might work best to reduce pain experienced by people with ADPKD.[27] The issue is however complicated by a variety of descriptions of pain experienced in ADPKD which include chronic dull, acute sharp, and discomfort/fullness.[26,28,29] Pain may also present in a wide range of locations including the lower back, abdomen, head, chest, and leg.[30] Pain or discomfort has been reported at all disease stages. Patients at the early stage of the disease describe both intermittent pain and more prolonged episodes. For some, this discomfort could relate to repeated urinary tract infections or abdominal symptoms (abdominal bloating or feelings of pressure).[19,31] The onset of pain is not necessarily related to kidney function[30] although advanced ADPKD is more usually associated with abdominal fullness and pain.[20]

Fatigue is another common and particularly troubling symptom which consists of physical and mental components acting as a key obstacle in everyday life.[24] It is not just restricted to the later stages of the disease as some individuals at the early stage of the disease report fatigue and weakness.[31] Urinary symptoms such as urgency, frequency, and nocturia[26,28] are commonly reported especially by women.[21,32] Physical body changes in terms of an enlarged/distorted abdomen from polycystic kidneys and/or liver can lead to social embarrassment, particularly for women.[13] This abdominal fullness and early satiety is present across all stages of ADPKD[20] and could, in part, relate to polycystic liver disease, a feature commonly found in ADPKD (44%).[19,21]

Table 1. SPIDER Framework for Search Strategy

Sample	People with ADPKD
Phenomenon of Interest	Experiences of their disease
Design	Any study methods
Evaluation	Patient perspectives
Research type	Qualitative and mixed methods

Abbreviation: ADPKD, autosomal dominant polycystic kidney disease.

Lifestyle and Dietary Interventions

Positive lifestyle choices for patients with ADPKD include increased water intake, dietary changes including salt reduction, lower potassium or lower protein, blood pressure management, and low-risk exercise.[15,19,28,33] These may have some benefit in improving the quality of life and extending the time to kidney failure.[15] Some patients have recognized the benefits of lifestyle changes in taking control of aspects of their condition, whereas others report that lifestyle changes could negatively impact quality of life.[28,34]

Most patients recognize the potential benefits of reducing dietary salt.[34] A reduction in the amount of animal-based protein and increased fruit/vegetables are believed to be the easiest recommended dietary changes to implement. Nonetheless, some have reported that tracking and monitoring their daily diet is difficult to maintain and find it easier to avoid certain foods.[3] Recommendations regarding optimal water intake are less clear with a wide range of self-reported practices and patients receiving conflicting advice. It is important to note that this could reflect the advice given to patients taking tolvaptan to drink considerably more water.[34,35] Other recommended lifestyle changes include the avoidance of certain types of exercise or physical activity such as contact sports and weight lifting.[34] For younger patients, these could have the potential negative impact of missing out on participation in group sports/physical activity, regular school attendance, and normal social activities.

Psychological, Physical, and Social Impact

ADPKD has implications in the psychological, physical, and social health of those affected at all stages of the disease process.[14,19,26,36,37] The diagnosis of ADPKD has a major psychological impact on many patients and has been described by some as a "bomb," both by those with known familial and unknown *de novo* genetic variants. In a short space of time from diagnosis, they are informed about the poor prognosis, uncertain rate of disease progression, and the lack of any curative treatments.[1,15,17] Nevertheless, some with a known family history have reported a sense of relief when diagnosed due to a reduction in uncertainty.[17] This suggests that there is not a uniform response to the diagnosis of ADPKD. Psychological symptoms may also manifest as worry and frustration about the future.[28]

There are a large number of aspects surrounding ADPKD and its management that can impact the quality of life of a patient and their caregivers. Individuals have reported the impact that symptoms such as pain or digestive symptoms can have in limiting activities of daily living including simple tasks such as washing or grocery shopping.[1,13,14,36,38] It is not only physical symptoms but also the experience of fatigue, physical body changes, anxiety about the future, and low mood that threaten their sense of normality.[13] These symptoms also produce a daily reminder that they are "sick," reinforcing illness self-identification.[1] This is made worse by the variability of certain symptoms such as sudden pain leading to the urgent need to reschedule events or being unable to undertake regular physical exercise, thus limiting the ability

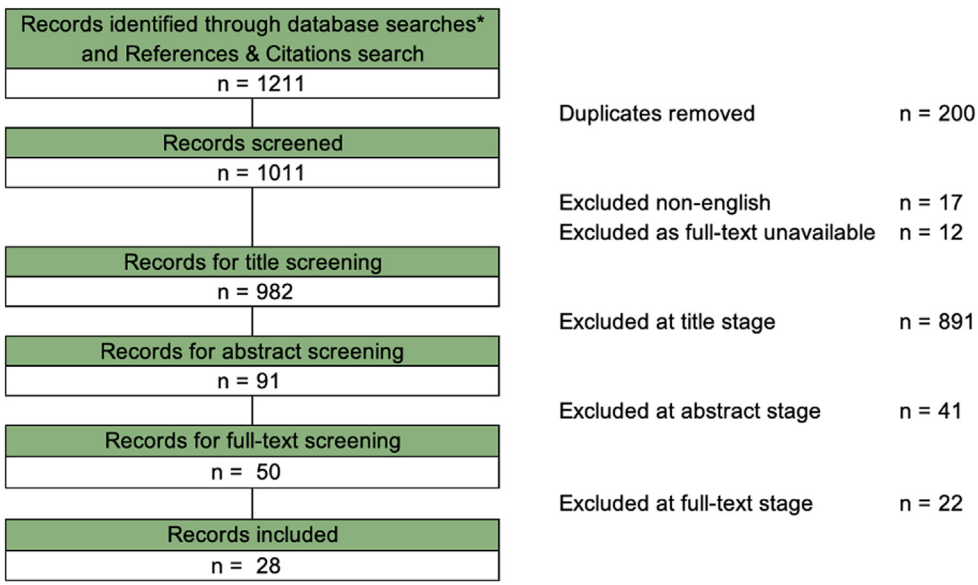

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

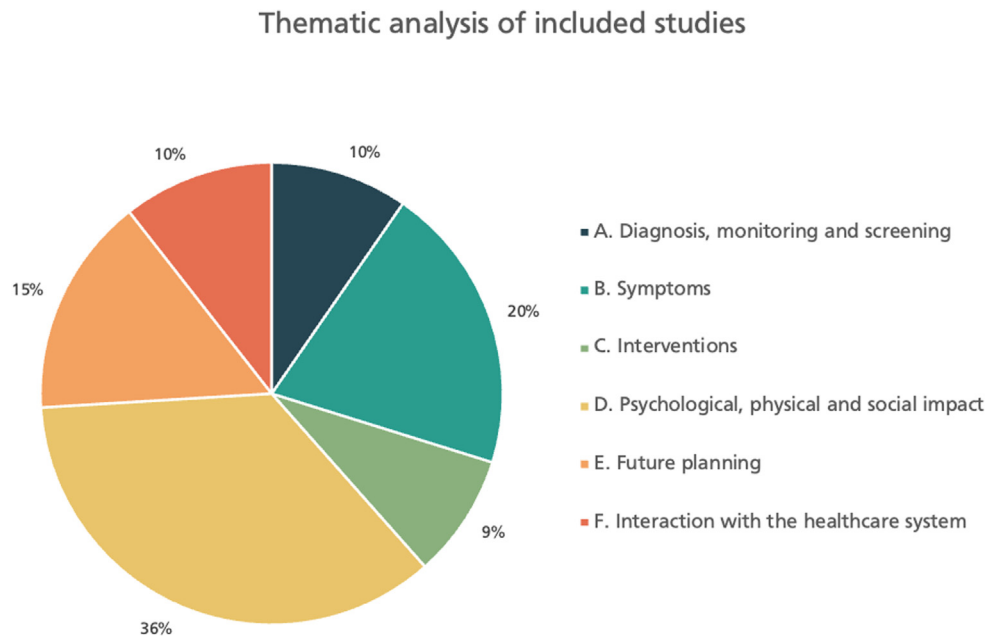

Figure 2. Thematic analysis summary of frequency. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

to lead a normal life.[24] The impacts on quality of life include the inability to complete a full day of work, engage in leisure activities, and sleep disturbance.[22] It is reasonable to assume that these factors may negatively impact the sexual health as found in other chronic illnesses through misconceptions, body image concerns, or psychological impact.[39] Quality of life is known to worsen as the disease progresses.[20]

Some report a sense of regret later in life, with individuals wishing they had known about their condition earlier and made different lifestyle choices. This is not limited to those diagnosed later in life as it can include patients who had chosen not to engage with their self-management, with health care systems, or come to terms with their condition earlier.[15]

Early in the disease process, the disease can be considered "invisible," which can lead to symptoms such as fatigue and depression from being misunderstood and patients feeling isolated or actively isolating themselves to avoid having to explain their illness.[1,13] This could be described as a "hidden disability." This behavior could also impact their employment adversely, with employers not understanding why patients may not be able to meet their expectations due to their "invisible" symptoms.[13]

As an inherited condition, witnessing other affected family members experiencing aspects of ADPKD can lead to an underlying anxiety that they may experience the same consequences, representing a familial burden.[1,13] This burden could extend to a constant "genetic guilt" and self-blame with a sense of being responsible for passing on the condition to the next generation.[1,13,16,18,24–26,33] Conversely, it has been reported that younger people might feel resentment toward their parents.[1] There are also descriptions of feeling disgrace in being affected by a hereditary disease, leading to feelings of shame more generally and further worsening isolation.[13,24] Thus, concern for family may drive the interest of many toward

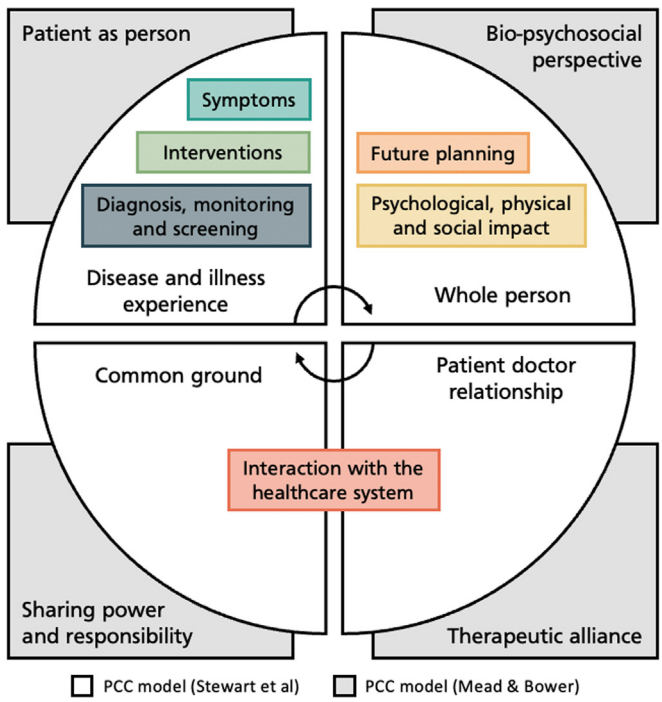

Figure 3. Patient-centered care (PCC) model, as adapted from the study by Hudon and colleagues.[12] (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.

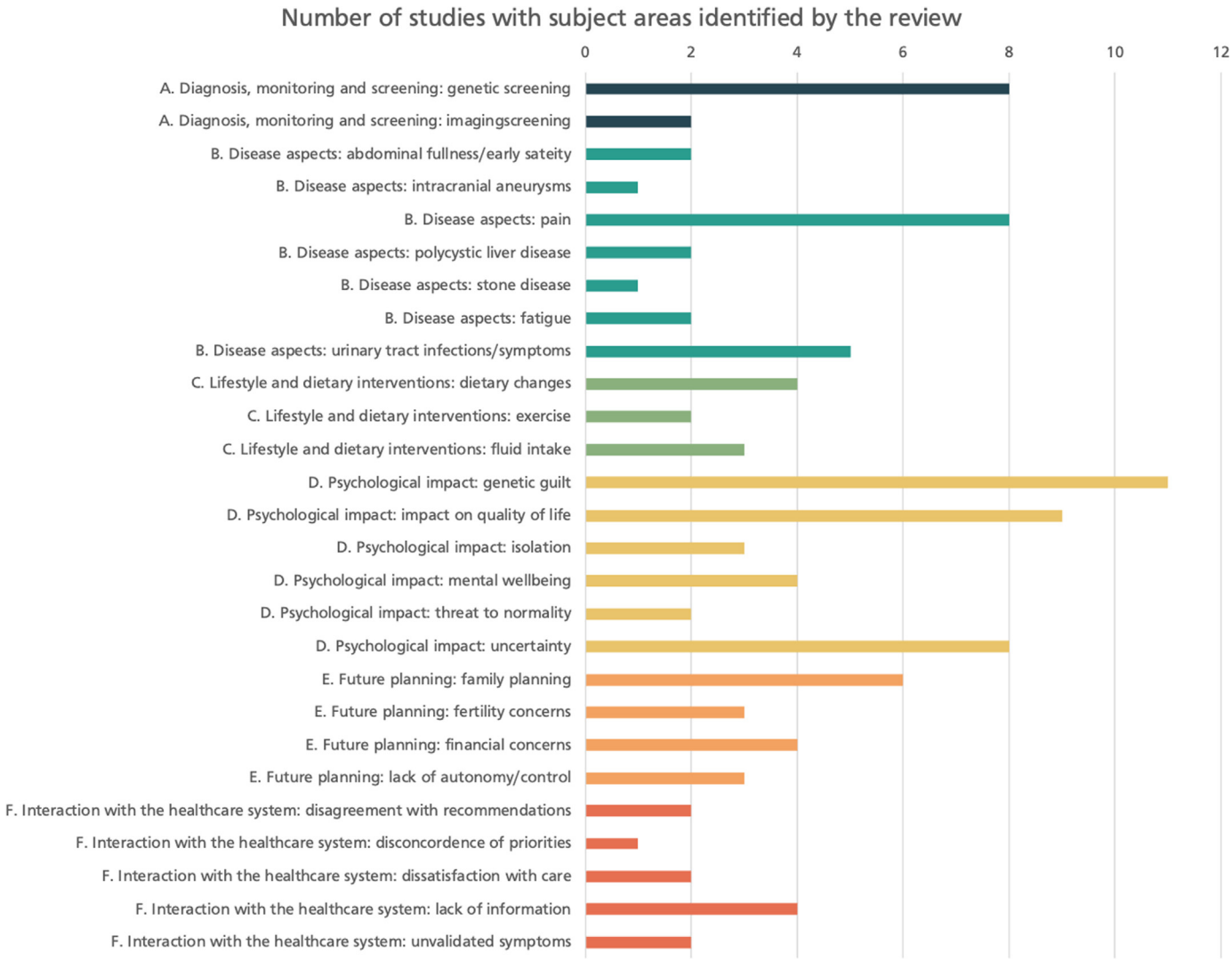

Figure 4. Number of studies with subject areas identified by review. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

genetic testing and preventative interventions.[19] Childhood genetic testing has been viewed by some as beneficial.[40] However, the genetic testing of children is not simple, with potential implications in terms of whether it is the right thing to do for the child from different perspectives which include ethics, future finances, respect for normality, and autonomy.[1,13,40,41]

Depression and adverse psychosocial well-being have been identified in patients with ADPKD to be associated with chronic pain, sleep disturbance, perceived lack of social support, and an inability to cope with the diagnosis of ADPKD.[14,22,36] This increased psychosocial risk is associated with markers of disease progression and a poorer quality of life.[36] It is of particular relevance in adolescents to whom the diagnosis of a chronic disease may have a negative psychological impact at a time of making life-shaping decisions.[28]

Future Planning

Uncertainty is a key concept in ADPKD, with some patients describing feeling powerless. There are particular concerns regarding specific features such as the risk of intracranial aneurysm rupture, viewed as an unpredictable and potentially life-threatening complication yet with no preventative treatments available. This unpredictability makes future planning difficult for individuals as they do not know their likely prognosis and when interventions such as dialysis or transplantation might be required.[1,13,24,33,37] The situation is made more complex given the variability in clinical presentation and disease manifestations between and within families.[14] There are also difficulties in obtaining clear and accurate information, with conflicting recommendations even between health care professionals in the same department. When combined with leaflets, information from the internet,

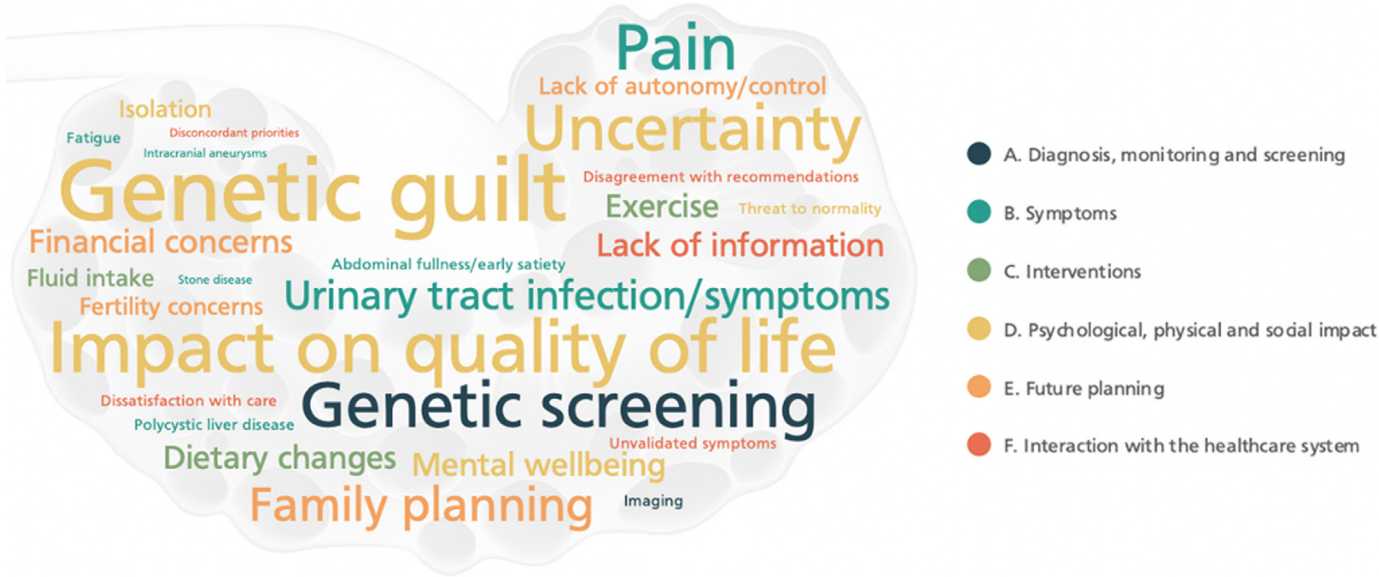

Figure 5. Word cloud of subject areas. (For interpretation of the references to color in this figure legend, the reader is referred to the Web version of this article.)

and talking to other patients, it is understandable why there is uncertainty, confusion, and a sense of being overwhelmed.[14,34,37] The mixture of being certain about the expected outcome of their disease yet uncertain about the timing and speed of progression may present itself as fear for themselves and their loved ones or loss and grief for a life they might have hoped to live.[31] This uncertainty can only be exacerbated by poor or insufficient information.[18,31]

The ability to prepare psychologically and medically for the future is important. Through engaging in screening and monitoring, patients can take more control of their condition and overall health and cope better with potential complications or treatments (eg, dialysis or transplantation).[13] However, some patients report that they feel unable to control or engage in self-care and have to endure symptoms with no cure available.[1,13] This could be described as a sense of futility, with patients feeling frustrated when they have engaged with monitoring and interventions[14] and can present as feelings of hopeless or helplessness.[31] Alternatively, the few visible symptoms or current impact on their quality of life could lead to a false sense of security or denial in some patients.[13–15]

Genetic guilt may lead some patients to make the decision not to have children through a fear of passing on the condition; however, this is not a viewpoint shared by all patients.[15,16,25,33,42] Equally some patients have reported not having sufficient understanding of the genetic component of their condition to base their decision whether or not to have children.[17] Opinions vary around the issue of prenatal testing in part due to the potential implications of testing including termination of pregnancies.[16,18,42] Family planning is felt to be medicalized, with some patients feeling influenced by clinicians in whether to have children and attending prenatal testing.[14] This is a particular issue given that conception may occur prior to parental diagnosis especially in the cases of "*de novo*" mutations, which can add to the sense of genetic guilt.[15] It is important to note that this anxiety could be underpinned by incomplete knowledge regarding the potential use of preimplantation genetic testing combined with *in vitro* fertilization.[42] There seems to be a wide range of approaches to parenthood, with some patients wanting extensive medical input and counseling while others desire to have children independent of the views of their physicians.[25]

Some patients have reported concerns regarding potential discrimination associated with the diagnosis from their employers. Due to the invisible but significant impact of symptoms, this could become a reality, with employers failing to understand the "hidden disability" associated with ADPKD, leading to termination, financial insecurity, and dependence on disability support.[1,13,14,33] Diagnosing ADPKD will also have an impact in obtaining life insurance as they have been described as "high risk."[1,13–15,33] This is of relevance when opting for screening as it would result in higher insurance costs or the lack of available policies.[15]

Interaction with the Health care System

There is evidence of discrepancy between the level of symptoms experienced from patient perspectives compared to medical perspectives. The impact of pain and fatigue on daily life and employment is often underestimated by health care professionals.[1,19,22,31] This can lead to some patients feeling that health care professionals trivialize their symptoms, with associated feelings of being an "imposter" adding to a sense of helplessness.[24] Conversely, there is a tendency for health care professionals to overestimate the

burden from urinary frequency, high blood pressure, liver cysts, and hematuria.[22]

People with ADPKD report varied experiences of health care.[25] Some describe distress or frustration with the lack of sufficient information.[18,30,31] This can lead to ambiguity through receiving vague and/or conflicting advice.[14,19] Some disagreements have been reported by patients when recommendations contrast with their personal beliefs, especially when considering lifestyle changes vs taking medications. One example would be the recommendation to avoid high-intensity exercise or contact sports with the loss of perceived or potential benefits to mental well-being and physical health.[34,38]

DISCUSSION

In this systematic review, we have identified six key themes from the perspective of people living with ADPKD and their experience of health care. These include

A) Diagnosis, monitoring, and screening
B) Symptoms
C) Lifestyle and dietary interventions
D) Psychological, physical, and social impact
E) Future planning
F) Interaction with the health care system

Diagnosis, Monitoring, and Screening

Perspectives in the diagnosis, monitoring, and screening theme focused predominantly on genetic approaches; these are complex being viewed negatively and positively. Some people report wanting to find out about their diagnosis earlier to enable lifestyle changes, plans for the future, and family planning. However, others consider that not knowing could be a form of harm-avoidance given the potential adverse psychosocial impact as well as implications for insurance and employment in the face of limited treatment options and poor outcomes.[15,16] Ultrasound screening itself is not free from harm with the potential for false negatives, insufficient information, and poor experience of the health care system.[17,19]

Symptoms

There are a wide range of symptoms reported by patients with ADPKD. Pain was the most common symptom with wide-reaching implications for physical health, mental well-being, and overall quality of life.[1,19,21,24–26] Although this is an important area from a patient's perspective, it is often underestimated by health care professionals.[1,19,22,31] Similar findings were reported in other chronic diseases where symptoms of chronic pain led to feelings of isolation, physical limitations, and perceived stigma from health care professionals or employers.[43]

Lifestyle and Dietary Interventions

Interventions mentioned in the included studies focused on dietary and lifestyle changes rather than medications or procedures. Due to the limited number of therapeutic options at present, there is a focus on the interventions to modify the risk factors influencing the rate of decline in kidney function.

Psychological, Physical, and Social Impact

Quality of life is believed to be significantly impacted by genetic conditions. This extends beyond the physical symptoms, with people perceived to be "healthy" still experiencing a lower quality of life.[44] This is similarly demonstrated in our review given the high number of studies focusing on psychosocial concepts such as genetic guilt from transmitting the disease to their children and disease uncertainty.[1,14,31] The impact of genetic guilt has also been recognized in the wider genetic disease literature.[45] Although not mentioned in the included studies, "survivor guilt" may be experienced by those with negative genetic test findings as a different form of genetic guilt.[46] Some of this guilt could be managed through genetic counseling, which aims to improve psychological well-being and adaptation of patients to their genetic condition or risk.[47]

Future Planning

Uncertainty was a key concept in the future planning theme influencing many of the other themes including diagnosis, psychological, physical and social impact, future planning, and interaction with the health care system. Greater uncertainty has been shown to be associated with depression, anxiety, and reduced quality of life in a variety of chronic illnesses.[48,49] It is important to note that cross-sectional studies have demonstrated that uncertainty can contribute to physical symptoms such as pain and fatigue.[48,50] This may explain variation in the experiences of pain among people with ADPKD.[26,28–30]

Interaction with the Health care System

The importance of the health care professional-patient relationship has been widely recognized in the management of people with chronic diseases. Nafradi and colleagues identified three key components of this relationship including providing psychological support, promoting health literacy, and empowering patients to cooperate in finding the correct treatment for them.[51] The psychological impact of ADPKD may be heightened through the perceived minimization of symptoms by health care professionals.[24] Experiences of uncertainty can be exacerbated through a poor health care professional-patient relationship due to inadequate information, vague answers, and conflicting advice.[52] Finally, the different care priorities between health care professionals and people with ADPKD can potentially undermine the ability of the health care professional to promote patient empowerment and encourage patient-centered care.[1,34,38]

Limitations

The systematic review should be interpreted in the context of potential limitations. First, the study results were limited to the English language due to reviewer restrictions and limited resources for translation. Second, gray literature such as non-peer-reviewed reports and conference abstracts were excluded from the review. Finally, there was a predominance of studies in the review from the United States and European countries. Future reviews

should seek to include more studies with perspectives from patients in non-English-speaking countries or those with less research outputs.

CONCLUSION

This systematic review encompasses the current published articles on patients' perspectives of ADPKD from database inception to April 2022. It summarizes the most common themes of studies focusing on patient perspectives of ADPKD from diagnosis to renal replacement therapy and future planning. Understanding the most troublesome symptoms and aspects of care that are important to people with ADPKD is an important first step toward better provision of care for patients and their relatives.[53] This approach has been recognized by the UK Kidney Association initiative for kidney patients with a rare disease and their families who are encouraged to be involved in the design of care pathways, health care services, audit, and research.[54]

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