

The Experiences of Patients Treated with Complete Removable Dentures: A Systematic Literature Review of Qualitative Research

Shamiso Chakaipa ^{1,2,*} , Sarah J. Prior ³ , Sue Pearson ¹ and Pieter J. Van Dam ⁴ 

¹ Tasmanian School of Medicine, University of Tasmania, Hobart, TAS 7000, Australia

² Oral Health Services Tasmania Hobart, Hobart, TAS 7000, Australia

³ Tasmanian School of Medicine, University of Tasmania, Burnie, TAS 7320, Australia

⁴ School of Nursing, University of Tasmania, Burnie, TAS 7320, Australia

* Correspondence: shamiso.chakaipa@utas.edu.au

Abstract: Patient experience has been acknowledged as a critical dimension of healthcare quality alongside patient safety and clinical effectiveness. However, patient experiences in complete removable denture wearing have not been well established qualitatively. The purpose of this review was to synthesize qualitative studies that investigated the experiences of people wearing removable dentures in order to gain a deeper understanding of the issues and their causes. Databases of PubMed, SCOPUS, and CINAHL were searched to assess articles published in English from 2010 to 2021 globally. Qualitative studies that reported on experiences of people wearing removable dentures were included. A total of ten studies were included. People who wear dentures expressed diversified experiences (both negative and positive), including physical, social, psychological processes, and affective responses. Furthermore, experiences were related to emotions, maintenance of dentures, hygiene, access to care, and cost. Those wearing implant retained dentures reported more positive experiences than those who wear conventional complete dentures. Denture wearing experiences is a complex phenomenon involving the patient in wholeness including their environment. Healthcare professionals should be considering a holistic approach when providing denture rehabilitation. There is a need to further explore denture wearing experiences using qualitative approaches, as understanding of patient experiences can inform and provide clear directions on quality improvement initiatives and health-care policy development.

Keywords: conventional complete dentures; implant retained overdentures; patient experiences; qualitative research



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1. Introduction

Recent advances in health service research have contributed to the improvement of consumer outcomes globally [1]. Many countries have developed various approaches, tools and strategies to involve consumers in health service research as a way of ensuring that the voice of the consumer is central to change [1]. In Australia, embracing consumer contributions and ongoing consumer consultation in health research has led to increased participation and collaboration in planning, design, delivery and evaluation of health care and health services [2]. Evidence suggests that beneficial partnerships are often formed between healthcare organisations, service providers and consumers [1–3], focussing on quality improvement through addressing needs and preferences of consumers by seeking, listening, understanding, and responding to experiences and expectations around health care [2]. The potential benefits derived from greater consumer involvement in health research include better accountability, quality and outcome improvement, effective translation of research, public confidence, and lower costs [2].

Consumer involvement in health service research has traditionally been of a qualitative nature due to its ability to be genuinely inclusive [3]. Qualitative approaches create an

avenue for exploring a greater and deeper understanding of perceptions, motivation, interpretations of a specific population and focuses on direct experiences of participants [4,5]. Whilst the use of qualitative research methods in healthcare and health services, is increasing [4–6] its use in dental prosthetics research is limited.

Oral health has been linked to overall quality of life, and in an ageing population, more older people are likely to have chronic diseases and co-morbidities which impact both on their perception of their health status and their capacity to effectively perceive and carry-out favourable oral health behaviours [7]. Denture rehabilitation is one of the oldest, most common, and most cost-effective methods of treatment for people who partially or completely lose teeth [8] and its impact on people's lives can be significant. In Australia, it has been estimated that 21% of adults aged 65 and over have no natural teeth and in the same age bracket who have natural teeth, nearly half (47%) wear dentures [9]. Previous studies have reported that prosthetic intervention outcomes through complete removable dentures, vary significantly among patients [10]. This variation includes coping and responding well to treatment to finding it difficult to cope with denture wearing [10].

In a study by al Quran et al. [11] 16% of participants consistently and persistently reported problems with their dentures. The major concerns being poor retention and instability, intolerance of the prostheses, poor mastication with food accumulating under the denture, unsatisfactory appearance, retching, pain or discomfort, and speech alteration. When patients experience such problems, they often return to dental clinics for redress such as relining to mitigate poor retention [12,13] spot or selective grinding to remedy pain and poor mastication [14] and remakes. The redress, however, can be met with limitations which include patients experiencing subsequent visits back to clinics. These visits are not only laborious, costly, and inconvenient to both the patients and the clinicians, but at times result in failure of the treatment [15] thereby diminishing oral health quality of life for patients.

Conversely, some patients rehabilitated with removable dentures report positive experiences which include improved oral health quality of life and satisfaction [13,16]. Findings by Heydecke et al. [10] suggest that coping styles such as emotional-focused coping play a central role in positively influencing oral health related quality-of-life and the patient experience. Limited patient-centered studies focusing on the marked experience variation among patients has meant that denture rehabilitated patients have had a limited voice in oral health service design, development, or improvement. Most patient experience data to date, has been collected using a combination of scales and survey instruments [17] which unlike qualitative studies, lack deep, exhaustive, and rigorous experiential data. Marchini [18] has argued that factors concerning patient satisfaction experiences have not been addressed well, highlighting a major gap in the literature worthy of further investigation. Removable dentures can be either complete or partial. The experiences of using them can be different, as the way that the dentures are kept in place differs [18].

This systematic review seeks to explore and understand the experiences of people who are rehabilitated with complete removable dentures. We have chosen to look only at complete removable denture patient experiences as we believe that there may be significant differences in the experiences of patients with only partial dentures.

2. Methods

2.1. Search Strategy

Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a systematic literature search was conducted in electronic databases of PubMed, CINAHL and Scopus, followed by a manual search in Google Scholar. The aim of the search was to identify, appraise, and synthesise evidence of the factors that influence people's experiences of wearing complete removable dentures investigated through qualitative studies published between 2010 and 2021 globally.

The inclusion criteria for this search were qualitative studies that investigate complete removable denture wearing experiences, qualitative findings in mixed method studies that

investigate complete denture wearing experiences, articles written in English or translated into English, written in the eleven-year period and accessible full text articles. Quantitative studies only, studies that investigate non dental prosthesis, and other dental prostheses other than removable dentures were excluded. Search terms for each concept (Table 1) were identified using free text terms and controlled vocabulary terms to create searches. All terms within each concept were combined using OR and was applied to all the databases.

Table 1. Search terms used.

	Concept 1	Concept 2	Concept 3	Database
Key concepts	Denture patients	Experiences	Study Design	
Free text terms	Denture patient * Denture client * Denture wearer * Denture recipient * Overdenture patient * Overdenture client * Overdenture wearer * Overdenture recipient *	Experience * Feeling * Opinion * knowledge Perspective * Expectation * Attitude	Qualitative Mixed research	PubMed CINHAL Scopus
MeSH terms	Dentures	Patient Satisfaction Perception * Attitude * Pain		PubMed CINHAL Scopus

* denotes wildcard symbol that broadened our search by finding words that start with the same letters.

2.2. Study Selection

Reference sorting and screening were carried out via Mendeley reference manager and Covidence, respectively. All references were aggregated in Mendeley, where duplicates were identified and removed before being exported to Covidence for further screening. Further duplicates were removed in Covidence. Two reviewers (SC and SP) screened for title and abstract while one reviewer (PvD) resolved any conflicts. Full text screening was carried out by two reviewers (SC and SP) while other two reviewers (PvD and SPe) resolved conflicts. The second stage involved a manual search including citations within references to identify further relevant studies.

2.3. Quality Assessment

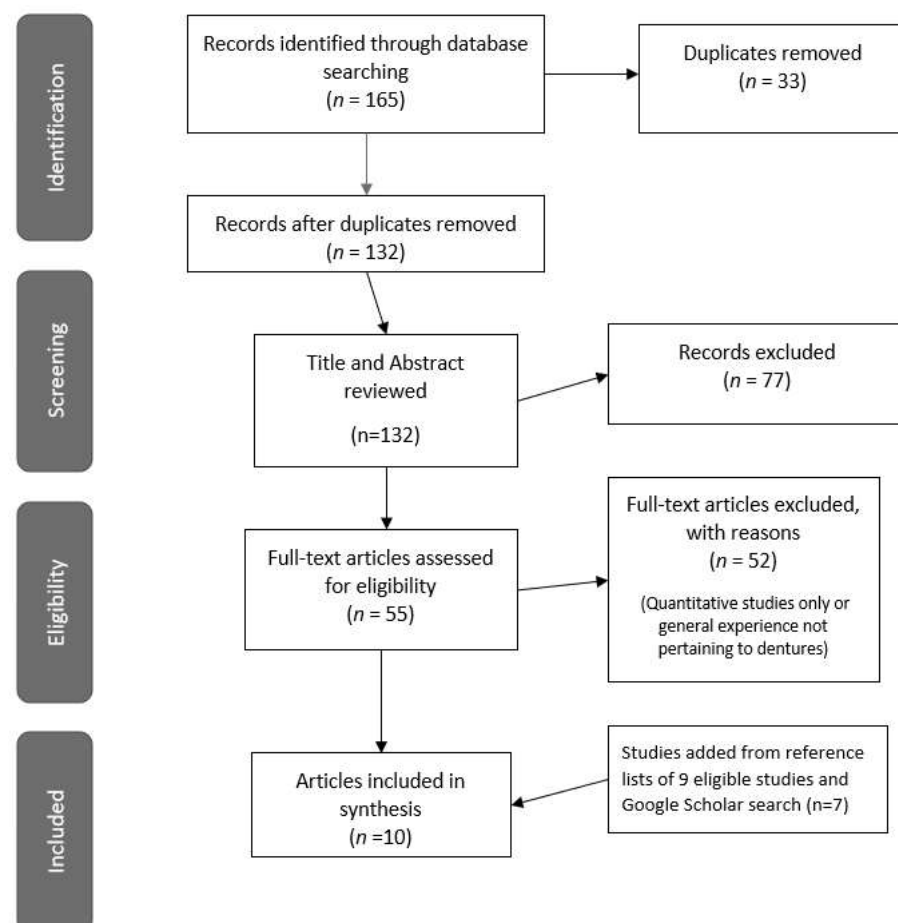
Articles that met the inclusion and exclusion criteria were subject to quality assessment by the Critical Appraisal Skills Program (CASP) which consists of ten item checklists as described in Table 2. Applying this tool, each item was categorised as YES, if it was clearly justified in the study; NO, if the item was not appropriately justified; and CAN'T TELL, if the item's appropriateness was doubtful. Each item that had YES category was assigned a score which were then aggregated out of 10 (See Appendix A). Some items were left unscored for systematic review articles as the items could not be properly applied. Nevertheless, the scoring average was well above 5 which signified strong positive score for the articles. SC and SP carried out the assessment and was confirmed by SPe. Any conflicts were resolved by PvD.

Table 2. Critical appraisal Skills Program Tool.

Item	Questions
1	Was there a clear statement of the aims of the research?
2	Is the qualitative methodology appropriate?
3	Was the research design appropriate to address the aims of the research?
4	Was the recruitment strategy appropriate to the aims of the research?
5	Were the data collected in a way that addressed the research issues?
6	Has the relationship between researcher and participants been adequately considered?
7	Have ethical issues been taken into consideration?
8	Was the data analysis sufficiently rigorous?
9	Is there a clear statement of finding
10	How valuable is the research?

3. Results

Ten articles were included in this review [5,19–27] (Figure 1) and the characteristics of each article are presented in Appendix B. Eight articles were identified as purely qualitative. Two used grounded theory or had elements of grounded theory [23,25] and two used focus groups to obtain data [19,24]. Two literature reviews were identified [5,27], one on qualitative studies [5] and another on mixed methods studies [27]. Articles were published between 2010 and 2021 in varied settings including five in the United Kingdom; two in Brazil; two in Sweden and one in New Zealand.

**Figure 1.** PRISMA summary of articles identified.

The quality assessment of the included articles reveals that the mean score obtained was 8.5 with a range from 7 to 10. There were six studies that had an excellent score (above 9) and the remaining four had a good quality score (7 or 8). Appendix A shows the appraisal for each individual article.

3.1. Themes

Analytical themes that described the experiences of people who wear complete removable dentures were developed (Table 3). The themes generated provided an interpretation of the findings that went beyond the contents of the ten papers, while also staying close to the purpose of the review to understand better the experience of people who wear dentures. The literature suggests that denture wearers' experiences are diverse. Analysis of the studies revealed six key concepts including patient experience which is impacted by: emotional, physical, psychological processes and affective responses, social interaction, hygiene and maintenance, and access cost related factors.

Table 3. Theme development flow diagram.

↓	Free Codes	Peace with dentures Unhappy to remove Normalcy Restoration Insecurity Denture wearing Endurance Disliking of denture wearing	Functionality Intrusiveness of dentures Loose dentures Dentures and foreign objects Denture insertion Discomfort	Quality of life Successful adaptation Patient satisfaction Old age disliked Self-esteem Denture wearing mystified Persistence pays Psychological	Socialisation impacted Socialisation enhanced Socialisation limited	Cleaning of dentures Contaminated dentures	Dentures unaffordable Teeth left to rot as too costly to go to dentist ISODs too costly Too far to get to dentist
	Descriptive Themes	Discomfort Anxiety Helplessness Satisfaction Shameful	Physical pain Resisting Stable and retentive Comfortable Endurance Denture removal Self-management dentures	Confidence Denture dependency Negative perception Denture adaptation	Self-consciousness Privacy	Cleanliness	Access Affordability Cost
	Final (Analytical Themes)	Emotional Factors	Physical Factors	Psychological and Affective Response	Social interaction	Hygiene and Maintenance	Access and Cost

Each theme is described in detail below.

3.2. Emotional Factors

This review suggested that patients who wear dentures are significantly impacted by emotional factors. Zhang [28] described emotion as attitude experience regarding “*whether objective things meet individual needs or not*”. Zhang [28] elaborated further by explaining that emotional factors can include motivation, confidence, and anxiety. Emotional factors can be individualistic or experienced between and among people. Anxiety, motivation, self-confidence, attitudes, and personality are individualistic while empathy occurs between people [28]. The feelings ranging from dissatisfaction, embarrassment/shame, powerlessness, fear, confidence, or lack of and satisfaction were experienced in relation to wearing dentures [5,19–21,23,24,27]. For patients who were rehabilitated with implant retained dentures (IRODs/ISODs/SIMOs) experiences of improved satisfaction and self-confidence were reported with improved quality of life compared to patients who were rehabilitated with complete conventional dentures (CCDs) [24,25,27]. It has been suggested that implant retained dentures are the preferred type of prosthesis by patients [21,27]. However, the study by Ellis et al. [19] revealed that fear discouraged some patients from seeking ISODs/IRODs despite finding CCDs dissatisfying. The fear emanated from perceived

pain associated with surgical procedure, fear of post-operative complications, post-surgical denture wearing experiences, age-related factors, vulnerability, and complications [19]. The authors concluded that such fear, however, was only perceived and primarily brought about by lack of information or disinformation regarding IRODs/ISODs treatment [19]. In many instances, previous bad experiences and general dislike for removable complete dentures led patients to seek IRODs/ISODs [23,24,26]. Reliance on CCDs caused hesitance to seek IRODs/ISODs [19].

Nordenram et al. [5] observed that quality of life decreases with edentulism as patients suffer from both form and function which manifests as poor facial aesthetics and food masticatory deficiencies. Quality of life was however, regained after oral rehabilitation with removable dentures or implant retained denture [5]. Narby et al. [23] discovered shameful feelings arising from the soreness caused by dentures were common, including being ashamed to disclose denture wearing to other people other than family members. Some patients felt powerless in improving adaptability on their dentures [23]. Feelings captured include: *"I really have got my life back . . . because I wouldn't go out anywhere to dinners . . . it was so embarrassing, so I just didn't. It was really bad. But after this I go out, you know, I've got so much confidence."* [23].

3.3. Physical Factors

Physical factors encompass responses which impact the body physically and functionally when removable dentures are being worn. The literature demonstrated that patient experience was influenced largely by the type of dentures worn, namely, conventional complete dentures (CCDs) or implant retained overdentures (ISODs/IRODs/SIMOs). In patients who wear CCDs, retention, and stability loss were the most prevalent physical complications [20,22,23,26,27] followed by mucosal irritation [19,20,23,27]. Retention is defined as the ability of the denture to resist vertical forces of dislodgements while stability refers to resistance to displacement when the denture is subjected to functional, horizontal, or rotational stresses or forces, respectively [29]. Poor chewing ability resulted in patients experiencing ulceration, soreness and pain on denture bearing areas [5,20,23,27]. Inability to chew led wearers to be selective about diet excluding salads and fruits [20,23,27]. Decreased fibre diet intake consequently led to wearers experiencing indigestion and constipation problems or refraining from eating food altogether. Further physical factors were outlined by Narby et al. [23] who added experiences such as gagging and the loss of food taste. This caused denture wearers to avoid food leading to weight loss and social isolation [23]. Narby et al. [23] summarised these experiences with denture wearers stating: *"I lost a kilo per week; I couldn't eat, just couldn't. I gagged all the time. I couldn't be among people"* and *"I couldn't sense any taste. My husband had to do all the tasting when I was cooking"* [23]. Patients lamented that experiences of poor fitting dentures felt worse than someone having poor oral health [23]. Problems arising from experiences with conventional complete denture wearing were the main driving force behind patients seeking implant retained dentures [26]. Narby et al. [23] noted that some denture wearers experienced excess salivation which led to annoyance, biting on the cheek, tongue, and lip muscles. *" . . . and I get rather much saliva"* [23].

Phonetics (sounding of words) was found to be a challenging experience for many patients who wear dentures [20,23] while others found speech clarity improving after implant retained denture rehabilitation [21]. Some patients reported speaking with lisping sounds and a struggle to control movement of their dentures in the mouth [21]. Experiences of over-denture failing through fracturing were reported [24]. Such fracturing resulted from chewing load and dentures being dropped particularly during cleaning [24]. The fracturing of dentures left patients with feelings of being troubled as well as insecurity. Other patients reported becoming more cautious during denture cleaning [24].

In the Nogueira et al. study it was expressed as *"I was sort of insecure after it broke (the SIMO). I had my upper denture for 5 years and it never broke . . . "* [24].

A more favourable view of IRODs/ISODs when compared with CCDs was suggested in a number of studies [5,20,21,23–27]. Kashbour et al. [21] placed anticipated functional

and social improvement as the major motivation for patients seeking implant retained denture treatment. Osman et al. [25] and Grey et al. [20] also noted increased retention in lower dentures had resulted in increased functional improvement experiences. Thomason et al. [27] noted masticatory function or chewing ability improved with ISODs treatment, further suggesting the superiority of implant retained dentures over removable complete dentures. Swelling of face caused by chronic rubbing of removable dentures was one of the physiological experiences that motivated removable denture wearers to seek implant retained denture in Nogueira et al. [24] study. After the implant surgery described by participants as surprisingly painless coupled with the ability to eat better after the treatment, appear to have been the most satisfying outcomes for the participants [24]. While most improvements in chewing were attributed to ISODs there were however improvements attributed to CCDs particularly for patients transitioning from complete edentulism [19,22]. Such patients found the experience of denture wearing quite life changing. Sentiments such as *"I eat everything, crackling, meat, everything I chewed before (I lost my natural teeth)"* [22] were common.

3.4. Psychological Processes and Affective Responses

This review demonstrates evidence of influence of psychological factors in a variety of studies. Like other factors, a diversified pattern of experiences is noted. According to Stansfeld and Rasul [30], psychological factors are described as individual-level processes and meanings influencing mental states. These can manifest positively, as in happiness and vitality, or negatively, as in anxiety, stress, and depression [31]. Some of the psychological factors which were outlined include improved quality of life and coping [5,25,27] adaptability [22,24] increased anxiety [23], exceeded expectations, positive perceptions, and impression [24] negative perceptions and unhappiness, diminished self-esteem, and regaining self-worth [5].

Anxiety was experienced over dentures accidentally dropping out while at work or in public places by CCDs wearers as reported by Narby et al. [23]. The psychological discomfort was prevalent among denture wearers experiencing edentulism and wearing ill-fitting CCDs leading to diminished self-esteem [5]. Patients experiencing edentulism expressed negative perceptions and unhappiness experiences about loss of teeth leading to seeking denture rehabilitation [5,20–22,26]. CCDs wearers often experienced forgetfulness to wear their dentures resulting in over self-consciousness and involuntary self-behaviour modification such as face covering or shielding and apologising unnecessarily [20]. After denture rehabilitation, particularly with IRODs/ISODs/SIMO, many denture wearers reported they had regained their self-worth or self-esteem and confidence respectively [5,21,23–27]. Some denture wearers thought the denture rehabilitation process had exceeded their expectations and therefore had positive perceptions and impressions regarding the treatment process and outcomes [26]. The regaining of self-worth, self-esteem and confidence contributed to their overall quality of life. Some informant's feelings captured include: *"When you look at yourself in the mirror and see all the tooth gaps—that really takes your self-esteem down, and now I feel like a whole new person. Self-esteem is totally dependent on aesthetics"* [23].

3.5. Social Interaction

Denture wearing experiences were significantly influenced by social interactions and networks of denture wearers. These experiences included social restrictions, in the form of avoidance of gatherings, as denture wearers feared embarrassment which they will suffer in the event their dentures were to fall out in public due to looseness [20,23,26,27]. The studies reflected that not only were restrictions happening by denture wearers avoiding other people but also denture wearers self-restricting nutrition resulting in avoidance of hard fibrous foods [26]. Narby et al. [23] reinforced that denture wearers experienced huge social consequences characterised by being embarrassed to disclose denture wearing to other people who are not close family members. This social disability manifests as insecurity to eat out in restaurants with friends, potentially leading to limited social contacts [23]. Some wearers

claim physical activity was made impossible as dentures interfered with normal breathing and speech or communication during exercising [23]. Inability to communicate led to limited social networks which gave way to psychosocial problem such as decreased quality of life [24]. Denture wearing was stigmatised as signifying old age [26] and age played a substantial part in deciding or deterring CCDs wearers seeking IRODs/ISODs [20,23,24,26]. However, on the other hand positive social interactions were experienced after patients received ISODs, *“Now I can talk and eat with company, and I feel confident”* [26]. Similarly for patients who were treated with CCDS after complete edentulism experience, this too was life changing [19,20,22].

3.6. Denture Hygiene and Maintenance Factors

Denture hygiene has been defined as various actions and practices that reduce the spread or transmission of pathogenic microorganisms, and thus reduce the incidence of disease [32]. Thus, denture hygiene maintenance refers to the actions and practices that reduce the spread and transmissions of pathogenic microorganisms on dentures for upkeep [33]. Denture hygiene and maintenance were widely discussed in several studies [20,21,24–26] demonstrating the importance of these factors. There is evidence that food getting caught in dentures contributes to the unhygienic state of dentures [20] which then contributes towards un-aesthetic appearance and in some cases creates infection hubs which later cause denture stomatitis. Denture hygiene and maintenance is achieved mainly through regular cleaning of dentures using denture cleansers and other forms of cleaning methods as instructed by dental practitioners [25]. Experiences around denture hygiene maintenance are diverse with some patients failing to effectively clean their dentures [24], while others found cleaning of dentures easy [26]. Patients who were functionally impaired were the most impacted by difficulties of cleaning of dentures [24]. Cleaning was impacted by visibility in some cases [25]. Sentiments captured by Nogueira et al. [24] such as, *“Nowadays I only brush the denture inside the bathroom sink, keeping my hands very close to it,”* demonstrate denture hygiene and maintenance practices by patients who wear dentures.

3.7. Access and Cost Related Factors

Various studies [19,22,27] uncovered a variety of denture wearing experiences which relate to access and cost of service. While consensus on the definition of access is still to be reached, the broad definition of access as *“the timely use of personal health services to achieve the best possible health outcomes”* by the Institute of Medicine [34] appears to be generally accepted. The definition conceptualises use of service and health outcomes as benchmarks to evaluate achievement of access [35]. More often, however, access has been equated to mean insurance coverage or having enough healthcare practitioners and healthcare facilities in a particular geographic area [36].

For patients who are seeking implant retained overdentures (IRODs) or implant supported overdentures (ISODs) as an alternative, the lack of information regarding the treatment, cost of both treatment and maintenance appears very prohibitive [25,33]. Osman et al. [25] reinforced that the reasons why there is limited acceptance of IRODs is due to costs and the lengthy treatment period, thus advocated for mitigated costs to increase uptake of IRODs by patients. Thomason et al. [27] further explained that comparatively ISODs/IRODs are more expensive, costing more than one and half times the cost of conventional complete dentures (CCDs). *“I wanted it so much and I haven’t done it before because I didn’t have the right (financial) circumstances. That was the only barrier for me”* and *“I cried, and I cried... I was very sad whenever I thought that I didn’t have money to treat my teeth. We don’t have enough money and we worry”* [22].

4. Discussion

This review explored the experiences of people who wear dentures, and it has provided a deeper understanding of the emerging issues. The increasing prominence that the patient experience has, and continues to have, in health-care clinical practice, policies,

research, and quality improvement, is distinctly undeniable [37]. Patient experience has been acknowledged as a critical dimension of health-care quality alongside patient safety and clinical effectiveness.

A clearer understanding of the patient experiences in general and in denture wearing in particular, can therefore assist clinicians not only to improve experiences at the point of care but also to provide guidance on further research and clear directions on quality improvement attempts and health-care policy formulation [37]. Exploring patient experience through qualitative methods also assists with the capturing of the real “voice” of the denture wearers themselves. This literature review reveals that patients who wear removable dentures undergo a wide range of experiences, both positive and negative, real, and perceived, across six themes. Despite a number of articles discussing physical implication of denture wearing [20,22,23,26,27] only one study provided a deep dive into the patient experience data [23]. Their use of a grounded theory approach appears to have enabled them to delve into this experience to uncover more. Therefore, grounded theory studies conducted in other settings might contribute to a better understanding of denture wearing experiences. Nordenram et al. [5] provided a stronger coverage of the psychological and affective responses than other studies suggesting the great importance of this factor. The salience and strength of emotional factors was demonstrated by its coverage in the majority of papers [5,19–21,23,24,27]. Therefore, it can be concluded that emotional factors play a large role in the experience of people who wear dentures. It is important that healthcare professionals are educated and trained to handle the emotions involved in wearing dentures, as this might help to improve the clients experience [38]. Access and cost factors played a major role in the context of transitioning from CCDs to ISODs. This information plays an important role in ensuring adequate and appropriate care for patients who already wear dentures and for those who may be transitioning to wearing dentures. Emphasis should be placed on improving access and cost issues to ensure that patients receive the best care possible [39]. When these factors are improved, the patient experience will become more positive. Whilst each of these factors has a role in the overall patient experience, negative experiences were more consistently reported as physical pain and discomfort and fear. More work should be undertaken to address the issues of physical pain and discomfort and this can be carried out through making implant treatment readily available and affordable.

Some of the negative experiences of patients could be attributed to the notion of separating the mouth from the rest of the body which downplays the interconnectedness of the body as a whole [40]. This often results in less attention being given to the health of the mouth at the expense of the rest of the body [41], leading to a failure of a key healthcare concept of holistic approach. A holistic health care approach is an important concept, promulgated centuries ago, which challenges the clinician to look beyond just the presenting problem but patient’s entire physical, emotional and spiritual health when planning, including oral healthcare [42]. Central to positive experiences aligned to social factors is when patients expressed that they felt relieved to be able to socialise after receiving implant retained dentures which ensured improved masticatory ability and confidence through improved retention and stability of the dentures. The connection between socialisation and successful denture rehabilitation, as revealed in this review, demonstrate the interconnectedness of the denture wearers and their environment. This means that apart from taking a holistic approach when providing denture rehabilitation, current and future denture rehabilitation practices must also consider the environment that surrounds the patient. Some social factors cannot be viewed in isolation as they can have rippling effects leading to other forms of social factors. For instance, social restriction or isolation may lead to inability to find or keep a job leading to lack of or reduced income [43], and lack of exercising leading to comorbidities such as obesity, diabetes, heart problems, hypertension, stroke, depression and anxiety and others [44]. Until the last decade, there was a consistent denial by medical care providers of any existing link between social factors and health outcomes, but nowadays through evidence and advocacy the relationship appears to be

fully acknowledged [45]. Such recognition has allowed healthcare planners to be able to quantify and appreciate the full extent of the impact of social factors on health care outcomes and the need to fully address them for further improvement.

Issues about wearing dentures, whether positive or negative, cannot be left to practitioners alone to resolve or appreciate, but at times it may be worthwhile to let the patients themselves take charge of their own oral health journey. Therefore, a suggestion to encourage patients who wear dentures to create and utilise self-help groups which can enhance coping experiences by allowing wearers to share and communicate their experiences with each other could be an empowering strategy which needs to be fully explored [46]. In addition, the studies in the review revealed some of the reasons why some patients experienced positive outcomes while others did not. The main reason of the variation of the experiences revealed in this study is directly influenced by the type of dentures worn (i.e., whether they are implant retained or conventional dentures).

5. Limitations

The limitations identified in this review is that the themes generated are based on ten studies. The generation of only a small number of published qualitative studies demonstrates that this is still relatively a new area of research in dental prosthetics. Only three databases were searched, and it is possible that other databases may contain qualitative studies not included in this review. However, the databases used in this review were the most appropriate ones for the topic under investigation. Furthermore, it was not clear as to how long some of the denture wearers had worn their dentures for. It is suggested that experiences investigated spanning over a long period of denture wearing may give a different outcome as compared to experiences spanning over a short period.

6. Conclusions

A wide variety of denture wearing experiences have been reviewed, categorised as physical, psychological, and affective response, emotional, social, and access and cost. The studies in this review provide a deeper understanding of some of the experiences of patients who wear dentures, however, it remains unclear whether these studies have captured enough experiences for us to draw a definite conclusion about understanding patients experience of rehabilitation with removable dentures. Physical experiences in patients can assist us in rethinking the whole person, not the mouth in isolation. Psychological processes and affective response, emotional, social and hygiene factors prompt us to consider the patient in wholeness including their environment when providing denture rehabilitation. The lack of current qualitative research, centred on the experiences of people who wear dentures highlights a gap that needs to be explored further to ensure that optimum patient care, quality improvement and policy development in health care can be achieved.

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Conflicts of Interest: The authors declare that there was no conflict of interest in this review.

Appendix A

Table A1. The CASP Tool.

Article	1	2	3	4	5	6	7	8	9	10
Item	Ellis et al., 2011 [19]	Osman et al., 2014 [25]	Narby et al., 2012 [23]	Thomason et al., 2012 [27]	Nodenram et al., 2013 [5]	Grey, et al., 2013 [20]	Rousseau, et al., 2014 [26]	Kashbour et al., 2015 [21]	Nogueira, et al., 2019 [24]	Lima de Paula et al., 2019 [22]
Was there a clear statement of the aims of the research?	+	+	+	+	+	+	+	+	+	+
Is the qualitative methodology appropriate?	+	+	+			+	+	+	+	+
Was the research design appropriate to address the aims of the research?	+	+	+	+	+	+	+	+	+	+
Was the recruitment strategy appropriate to the aims of the research?	+	+	+	+	+	-	+	+	+	+
Were the data collected in a way that addressed the research issues?	-	+	+	+	+	+	+	+	+	+
Has the relationship between researcher and participants been adequately considered?	+	+	ct			-	ct	ct	ct	+
Have ethical issues been taken into consideration?	+	+	+			-	-	+	+	+
Was the data analysis sufficiently rigorous?	+	+	+	+	+	+	+	+	+	+
Is there a clear statement of finding	+	+	+	+	+	+	+	+	+	+
How valuable is the research?	+	+	+	+	+	+	+	+	+	+
TOTAL	9	10	9	7	7	7	8	9	9	10

(ct) = Can't Tell; (+) = clearly addressed; (-) = not addressed.

Appendix B

Table A2. Summary of Included Articles.

No	Author and Year	Study Type	Country	Sample	Data Collection	Theme Outcomes	Comments	Quality Appraisal Score
1	Ellis et al., 2011 [19]	Qualitative	UK and Canada	30 participants	Semi structured interviews, focus groups	Theme Post-surgical denture-wearing; gums cut, leaving dentures in despite, cleaning of dentures	Embarrassed to go without dentures.	9
2	Osman et al., 2012 [25]	- verbatim transcribed - analysed using a thematic analysis - inductive approach - constant comparison technique - focussed coding - purposive sampling	New Zealand	16 ISODs participants	In-depth semi-structured interviews	- perception of implant overdenture treatment - positive and negative aspects of treatment - decisive factors in choosing implant therapy - factor influencing the selection of implant material - perception of mid palatal implant	- ISODs improve quality of life of patients - mitigating cost of treatment can increase acceptance - mandibular ISODs offer increased retention.	10
3	Narby et al., 2012 [23]	Qualitative Grounded theory	Sweden	10 participants Some having worn removable dentures	Constant comparative	Journey from social stigma to exhilaration: becoming the insecure person. becoming determined person; becoming the person I once was acquiring more realistic perspective.	- problematic experiences with CCDs wearing were push factors - Explained CCDs experiences as - worse than having poor oral health - physical pain, soreness leading to shame feelings, - anxiety over denture falling out - gagging - severe difficulties in chewing food, loss of food taste - Huge social consequences including - ashamed to disclose denture wearing except only close family members - powerlessness to improve on adaptability, - insecure to dine in restaurants and with friends, denture falling while at work. - speech and breathing difficulties when exercising - limited social contacts - difficult in eating, -physical and psychological problems.	9

Table A2. Cont.

No	Author and Year	Study Type	Country	Sample	Data Collection	Theme Outcomes	Comments	Quality Appraisal Score
4	Thomason et al., 2012 [27]	Systematic review of mixed articles	UK	10 articles	-	- satisfaction and OHRQoL is greater with mandibular ISODs than conventional dentures - masticatory function/chewing ability as outcome measures - concluded that ISOD provide significant improvements in masticatory performance. - improvements in what they can eat, how they felt about eating in social situations ISODs	- experiences expressed as Satisfaction and OHRQoL. - masticatory functions/chewing ability with ISOD improved. - social restrictions due to embarrassment - avoiding, social gatherings by CCDs. - nutrition-certain foods are avoided by CCDs. - ISODs cost 6 times more.	7
5	Nordenram et al., 2013 [5]	Systematic review literature review	Sweden	9 articles	-	- 2 third level themes: loss of quality-of-life associated with losing teeth and restored quality-of-life after oral rehabilitation - 6 s level themes: compromised function; lower social status; diminished self-esteem; managing loss; improved function; increased self esteem	- acknowledged new area with few published papers - edentulism compromises oral function and social status and diminished self-esteem. - oral rehabilitation has great benefits, reviving quality of life and self-worth.	7
6	Grey et al., 2013 [20]	Qualitative Semi-structure telephone interviews	UK	9 participants	-	- Normality of appearance. - Normality of function	- Interpretations can mislead pts into not adhering to the recommended maintenance - highlights some negative social impact of missing teeth and poor fitting dentures - embarrassment - restrained smiles - face shielding using - using hands on the mouth to cover gaps - forgetting to wear dentures made pts fully self-conscious and apologetic to people - felt missing teeth as nasty, awful - not able to chew, not able to enjoy food - only eating mush was boring and limiting - food getting caught, - speech affected due to ill-fitting dentures - lisping sounds in attempt to keep dentures in.	7

Table A2. Cont.

No	Author and Year	Study Type	Country	Sample	Data Collection	Theme Outcomes	Comments	Quality Appraisal Score
7	Rousseau et al., 2014 [26]	Qualitative	UK	29 participants including denture wearers	Semi structure	- Tooth loss was insignificant for some but disruptive for others - Two main form of disruption was identified (1) The meanings of tooth loss and (2) Relationship between the self and the mouth in denture users	CCDs problematic experiences prompted Pts to seek dental implants - dislike for CCDs dentures was apparent	8
8	Kashbour et al., 2015 [21]	Systematic review on qualitative research -textual narrative synthesis	UK	10 articles	To identify and summarise qualitative studies relating to patients' experience of dental implant treatment (DIT) at various treatment stages	ISODs patients placed functional and social improvement as main motivation to treatment.	- acknowledged few examples of qualitative research synthesis exist in Dentistry - improved eating experiences - increased food selection and enjoyment in social environment. - stability increased confidence and speech clarity - ulceration decreased.	9
9	Nogueira et al., 2019 [24]	Qualitative	Brazil	13 participants	Thematic analysis Focus group	Four main themes emerged: - before decision to undergo treatment with SIMO, - implant surgery experience, perception of treatment outcomes and impressions about the care received.	- information deficiency, cost, comorbidities, older age and fear were initial barriers impacting the decision for treatment. - dissatisfaction with previous treatment and a sense of opportunity motivated the decision - pain absence during surgery and discomfort during anaesthesia and post-surgical recovery exceeded negative expectations in most cases. - in general, participants presented positive perceptions and rewarding experiences after rehabilitation with SIMO.	9
10	Lima de Paula et al., 2019 [22]	Qualitative	Brazil	11 participants	Semi-structured interviews	Living with complete dentures: problems in adaptation period; interpersonal relationship; functional gains	Very difficult; access; cost; avoidance of food; chewing difficulty; living lower denture out; work on your psychology; you have to be calm; getting used to it. Effect on self-esteem; recover yourself; complete with dentures; pray; attend parties; meet with relatives; chewing recovery; eating everything	10

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