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Qualitative studies of patients' perceptions of loss of teeth, the edentulous state and prosthetic rehabilitation: A systematic review with meta-synthesis

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Abstract

Objective. To conduct a systematic review and meta-synthesis of qualitative studies addressing patients' perceptions of loss of teeth, edentulism and oral rehabilitation. ***Background.*** Qualitative studies can complement quantitative studies by achieving deep understanding of patients' subjective experiences of losing teeth and coping with edentulism. They can also explore the perception that the benefits of prosthetic rehabilitation extend far beyond primary clinical treatment goals of restoration of oral function. ***Materials and methods.*** The major data bases were searched extensively for relevant qualitative and quantitative studies, followed by manual searching of the reference lists of included publications. Two authors independently read all abstracts. Relevant papers were retrieved in full-text and included or excluded according to a specially designed protocol. The included articles were then appraised and rated for quality: high, moderate or low. Articles of low quality were excluded. ***Results.*** The database search yielded 36 abstracts of qualitative studies; manual search disclosed one further article. All were read in full-text by two independent authors: 28 were excluded. Of the remaining nine, two (assessed as of low quality) were excluded for further analysis. Meta-synthesis, based on seven studies, disclosed two major themes: loss of quality-of-life associated with losing teeth and restored quality-of-life after oral rehabilitation. ***Conclusions.*** In this relatively new field of research, there are few published papers. Nevertheless, the studies to date show that loss of teeth is associated not only with compromised oral function, but also loss of social status and diminished self-esteem. Oral rehabilitation has broad positive implications, restoring quality of life and self-worth.

Key Words: *edentulousness, qualitative research, quality-of-life, self-image*

Introduction

Tooth loss can vary in severity, from loss of a single tooth to loss of the entire dentition. Today, few people are completely edentulous, but many have one or more missing teeth. Poor oral health has both physiological and social impacts and it also affects self-esteem and overall experience of life. In developed countries, complete loss of teeth (edentulism) is no longer accepted as a natural part of ageing. When reasonably healthy elderly people speak about their oral health in interviews, they mention not only oral function but also social and psychological impacts on their quality-of-life [1]. The number of

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Table I. Search strategy.

Edentulous (TiAb)		
Jaw, edentulous (NoExp)		
Mouth, edentulous (NoExp)		
Edentulism (TiAb)		Qualitative research (Me)
Toothloss (TiAb)		Qualitative (TiAb)
Tooth loss (TiAb)		Grounded theory (TiAb)
Loss of teeth (TiAb)		Phenomenogra* (TiAb)
Toothless (TiAb)		Phenomenology* (TiAb)
Tooth loss (Me)		Hermeneutic (TiAb)
Dental implants (NoExp)		Meaning (TiAb)
Dental implantation, endosseous (NoExp)		Lived experience (TiAb)
Blade implantation (Me)		Phenomenology (TiAb)
Denture, overlay (Me)		Content analysis (TiAb)
Denture, complete (Me)		Ethogra* (TiAb)
Denture, partial, removable (Me)	AND	Etnogra* (TiAb)
Dental prosthesis, implant-supported (Me)		Social systems theory (TiAb)
Denture, partial, fixed (NoExp)		Quality of life (Me,TiAb)
Denture (TiAb)		Life quality (TiAb)
Prosthesis (TiAb)		Lifequality (TiAb)
Dental prosthesis (Me)		QALY (TiAb)
Oral surgical procedures, preprosthetic (Me)		QALY's (TiAb)
		QALYS (TiAb)
Dentistry (Me)		Interveiw, psychological/MT (Me)
OR Dental (TiAb)		Interview/s (TiAb)
AND Osseointegration (Me,TiAb)		Interviewing (TiAb)
Dental (TiAb)		
AND Implant/s (TiAb)		
OR Implantation (TiAb)		

teeth and thereby the ability to chew is also important for nutritional status [2].

Qualitative research methods are appropriate when there is a need to achieve a deeper understanding of people's perceptions, motivation, experiences and interpretations of a certain phenomenon. Qualitative studies are therefore an important complement to quantitative studies [3]. The subjective experience of losing one's teeth, adjusting to living with edentulism and the response to prosthetic rehabilitation of this condition can be described using qualitative analytical methods [4]. This knowledge can enhance the clinician's awareness of the condition and bring understanding that may lead to better or easier communication and integration with patients in this kind of situation.

The aim of the present study was to conduct a systematic review and meta-synthesis of qualitative studies of patients' perceptions of tooth loss, the edentulous state and oral rehabilitation.

Materials and methods

The basis of the study was a systematic literature review of published papers using qualitative methods and meta-synthesis of the results of these studies.

Literature search and selection

The first stage comprised an extensive literature search of the databases PubMed, Embase.com (Elsevier), EBSCO (Cinahl) and Ebsco (PsychInfo), using terms listed in the Medical Subject Headings (MeSH), to find qualitative and quantitative studies within the field. The date range for publications was from 1 January 1950 to 1/4/2010. The search terms comprised a combination of diagnoses, treatments and research methods (Table I). Stage two of the search comprised a manual search of the reference lists of included publications, including systematic reviews.

The following inclusion criteria were applied to studies identified by the literature search. The informants had to be adults (+18 years.) who had experienced some loss of teeth in one or both jaws. Preferably the subjects should have undergone some kind of oral rehabilitation of the condition, but this was not a requirement for inclusion. The study should be qualitative in design. The search excluded articles which did not address the research question or did not clearly describe the methods used or the data analyzed.

Two of the authors independently read all retrieved titles and abstracts. When at least one author regarded a publication as meeting the inclusion criteria, the full text version of the paper was ordered: the two authors then independently read the articles and recommended inclusion or exclusion: a pre-designed protocol (Table II) was used to describe briefly the research area covered by the paper, its relevance for the present review, whether the aims were well-defined and whether patient experiences were described using quantitative or qualitative research methods. Included publications were interpreted with the aid of a second protocol (Table III), appraising the quality of the study, with reference to aims, sample selection, data selection and analysis and the clarity and adequacy of the results.

The quality of the studies was classified as high, moderate or low, according to the criteria in Table IV.

Synthesis

After the screening process, the studies with applied analytical methods were tabulated and then stratified according to method/research design. Synthesis is the process of combining findings across the studies in order to create a new perspective or view. The synthesis process was performed according to Howell Major and Savin-Baden [5].

There are four stages in the synthesis seen in Figure 1:

(1) The articles were examined for the presence of themes (codes, categories or sub-categories). The themes were identified and verified by citations. Thereafter, the themes were examined to identify those appearing in several studies and were then condensed during development of the *first level theme*.
(2) Related first level themes were then distilled to form the *second level theme*. This was a complex and dynamic process where themes were arranged and re-arranged until clear second level themes emerged.
(3) Related second level themes were finally synthesized to an overall *third level theme*. Important patterns and connections among the second order themes were interpreted and problematized and the process repeated until third order themes were set.
(4) A general assessment of the scientific basis for the categorization was made and conclusions were formulated.

Evidence-based conclusions can be drawn when the studies identified are of adequate quality and relevance (interpreted as high or moderate study quality modified from SBU (Swedish Council on Health Technology Assessment) [6], as seen in Table IV).

Results

Literature search

The search strategy included both quantitative questionnaire studies (separate publication) and qualitative interview studies and yielded in all 2138 abstracts, of which 36 had used some qualitative analysis method. All 36 articles were ordered and read in full text. After a manual search of the reference lists of included publications, one more study was added. No systematic review was found. A flow diagram is shown in Figure 2.

Of the 37 publications read in full text version, 28 publications were excluded (Table V) and nine were included. One of the included studies used grounded theory as the qualitative approach [7] and one the phenomenological method [8]. Qualitative content analysis was applied in the remaining seven studies [9–15]. Two of these studies were of low quality and were not included in further analysis [14,15]. Of the seven studies analysed, the one based on grounded theory [7] used a better analysis method with a more developed theory than the rest. However, the results of the remaining six studies were in agreement with the one using grounded theory.

Interpretation of data

After the screening process, seven studies remained for meta-synthesis (Table VI). In the analysed studies of high or moderate study quality, two conditions are investigated: tooth loss and rehabilitation of tooth loss [7–13]. The informants expressed their feelings about being edentulous and after oral rehabilitation they reflected retrospectively on how it had influenced their life.

Sixteen first-level themes were identified (Table VII). These were condensed into six second-level themes. The experience of living without a full dentition was described in terms of 'compromised function', 'lower social status', 'diminished self-esteem' and 'managing loss', while 'improved function' and 'increased self-esteem' described the post-rehabilitation experience. The

Table II. Protocol 1: Inclusion or exclusion.

1st author:

Journal: Year: Volume: Pages:

PUBLICATION TYPE ☐ Primary ☐ Review ☐ Other

If "Other", specify type:

RELEVANCE FOR THIS REVIEW ☐ Yes ☐ No

AIM / PURPOSE well defined? ☐ Yes ☐ No ☐ Can not tell

My interpretation of the aim is:

AREA

Constructions for edentulous or partially edentulous without implants

☐ Full dentures ☐ Overdentures ☐ Removable partial dentures

☐ PFDP* ☐ FFDP**

Constructions for edentulous with implants

☐ Implant supported overdentures ☐ Comb fixed and removable implant sup prostheses

☐ FDP***

Constructions for partially edentulous with implants

☐ Partial dentures ☐ Implant supported FDP

☐ Comb tooth/implant FDP ☐ Single implants

Quality of Life or other aspects of patient experience

☐ Quantitative research methods ☐ Qualitative research methods

Health economy

☐

* Partial fixed dental prosthesis ** Full fixed dental prosthesis *** Fixed dental prosthesis

Reason for exclusion (according to exclusion criteria):

☐ < 5 yrs follow up ☐ < 20 patients with at least one jaw per patient

☐ > 25% losses to follow-up ☐ Surgical technique ☐ Other, specify:

Reviewed by: Date:

final synthesis yielded two third-level themes, 'loss of quality-of-life' and 'restored quality-of-life' for tooth loss and rehabilitation, respectively. The results are verified by citations from the studies.

The first third-level theme: Loss of quality-of-life. Loss of teeth is a multi-faceted experience. Four categories become evident in the theme 'loss of quality-of-life': compromised function, lower social status, diminished

Table III. Protocol 2: Appraisal sheet for 'patients' perspectives of events'—qualitative method.

1st author:

Journal: Year: Volume: Pages:

1. AIM ***Yes / No / Partly / Unclear***

Is the study based on a well-defined statement of the problem/ or a well-formulated research question?

2. SELECTION OF SAMPLE ***Yes / No / Partly / Unclear***

a) Is the selection relevant?

b) Is the selection procedure clearly described?

c) Is the context clearly described?

d) Is a relevant argument on ethics included?

e) Is the relationship between the researchers and the selected sample clearly described?

3. DATA SELECTION ***Yes / No / Partly / Unclear***

a) Is the data collection procedure clearly described?

b) Is the data collection relevant?

c) Has data saturation been achieved?

d) Has the researcher managed his own preunderstanding in relation to the data collection?

4. ANALYSIS ***Yes / No / Partly / Unclear***

a) Are the results logical?

b) Are the results comprehensible?

c) Are the results clearly described?

d) Are the results presented in relation to a theoretical frame of reference?

e) Is a hypothesis, theory or model generated?

f) Are the results transferable to a similar setting (context)?

g) Are the results transferable to a different setting (context)?

TOTAL ASSESSMENT OF STUDY QUALITY ***High / Moderate / Low***

Comments:

self-esteem and managing loss, i.e. the kind of coping strategy that was used.

Although the interviewees vary with respect to age, cultural background and social standing, the experience of losing teeth is described as a traumatic downhill life event. Edentulous people live in a state of constant anxiety, fearing that others may regard having no teeth or having bad teeth as a laughing matter. This can be described as a sort of oral hypersensitivity.There is also self-recrimination for past neglect of oral health.

The edentulous state is also associated with a perception of loss of human worth. The change in appearance is perceived as premature ageing: there is grief over lost youth and it can become so unbearable that the edentulous person does not want to look in the mirror.

Table IV. Study quality criteria (modified from SBU Swedish Council on Health Technology Assessment [6]).

High study quality	Moderate study quality	Low study quality
• Setting (context) clearly described • Well-defined research question to be addressed • Well-described sampling process, data collection method, transcribing process and method of analysis • Well-documented awareness of methodology • Systematic, stringent presentation of data • Clearly demonstrates that interpretation is based on the data • Includes a discussion of the trustworthiness and dependability of the interpretations • The results are presented in the context of previous research on the topic • Implications for clinical practice are well-formulated	• Setting (context) ambiguous • Research question ambiguous • Some ambiguities in sampling process, data collection method, transcribing process and method of analysis • Some ambiguities regarding the awareness of methodology • Ambiguous presentation of data • Some ambiguity as to whether interpretation is based on the data • Some ambiguity as to the trustworthiness and dependability of the interpretations • Some ambiguity in presentation of the results in the context of previous research on the topic • Proposed implications for clinical practice are ambiguous	• Setting (context) not clearly described • Research question to be addressed vaguely defined • Sampling process, data collection method, transcribing process and method of analysis not clearly described • Poorly documented awareness of methodology • Presentation of data is not systematic • Unclear that interpretation is based on the data • Discussion regarding the trustworthiness of the interpretation is poor or missing • Contextualising of the results in relation to previous research omitted or poorly developed • Implications for clinical practice are not presented or unclear

In the following, citations from the studies included in our analysis illustrate the second-level themes related to loss of quality-of-life: compromised function, lower social status, diminished self-esteem and managing the loss.

- *Compromised function* is described in first level themes as a physical loss of function, but pain can also mean limitations. To lose one's teeth can be seen as equivalent to an amputation and to be edentulous is perceived as a physical disability. Problems with speech, chewing, smiling and laughing, as well as pain from bad teeth are given as examples of compromised functions.

... it's inhibiting and you couldn't speak properly because it sounded so odd. you didn't want to smile, quite simply you just didn't want to open your mouth ... [8].

I remember once on the way home, the pain just came, sharp as a knife, and I had this sore all week ... [7].

- *Lower social status* has three first level themes: social stigma, loss of social competence and anxiety about being disclosed or unmasked. There is awareness that society has a negative attitude to visible gaps and bad teeth, which then become a social stigma, so the afflicted person tries to avoid situations where there is risk of exposure. One does not want to 'lose face' by being seen without teeth, even in front of close family members.

It was like someone was dancing in my mouth. I could not eat and I could hardly talk, and definitively, I could not socialize. I just stayed at home [7].

You can't go looking for work if you look the way I did (toothless) ... you are prejudged, you're branded [8].

I could have spoken openly to someone about the death of a friend but not the death of my teeth. [10].

... No, I don't think people did (discuss tooth loss), it's like that word cancer, isn't it? [10].

With removable dentures there is anxiety over being inadvertently disclosed in social situations: the dentures might become dislodged by chewing, coughing or laughing (anxiety of being disclosed, unmasked).

Kissing him was embarrassing—what if they fell out. You know, one of those things [7].

- *Diminished self-esteem* embraces three first-level themes: the influence of loss of teeth on self-confidence, appearance and grief/shame. Edentulous people perceive their condition as reducing them to the status of an amputee, no longer whole, but a lesser being. The effect on self-confidence can also lead them to doubt their sexual attractiveness.

I've always been quite fit and that person ... that part of me, is going downhill [13].

One feels somewhat misplaced, handicapped. Not human in a way [7].

If someone laughed, I thought they were laughing at me [9].

I feel embarrassed to go to bed; you turn your back because I feel my partner will keep laughing, and so ... your confidence is gone [10].

Many people grieve over their lost teeth and are ashamed about their poor oral health.

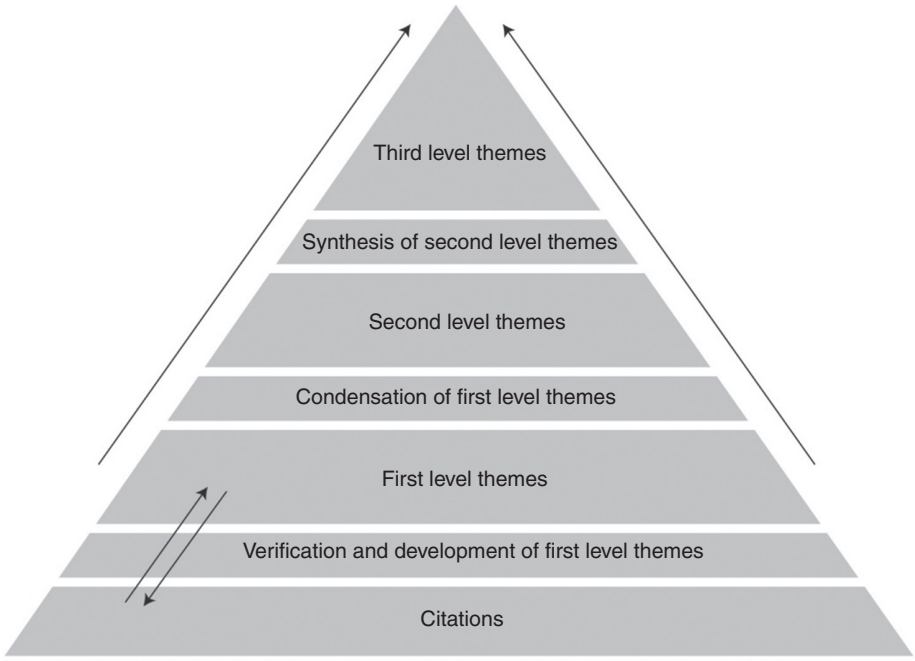

Figure 1. The process of synthesis for studies undergoing qualitative analysis.

I've found when I'm speaking to people I tend to be looking at their teeth and thinking. What lovely teeth you've got. Silly. I know. I didn't do that before ... Here's me with these horrible false teeth [13].

- *Managing loss* is commented on in first level themes as adaptation, self-reproach or making excuses. The coping strategy varies from accepting responsibility for one's poor oral health to looking for something external to blame. Adaptation can include a change in behaviour.

But of course, after so many years, you get used to the problems and behave automatically. And you

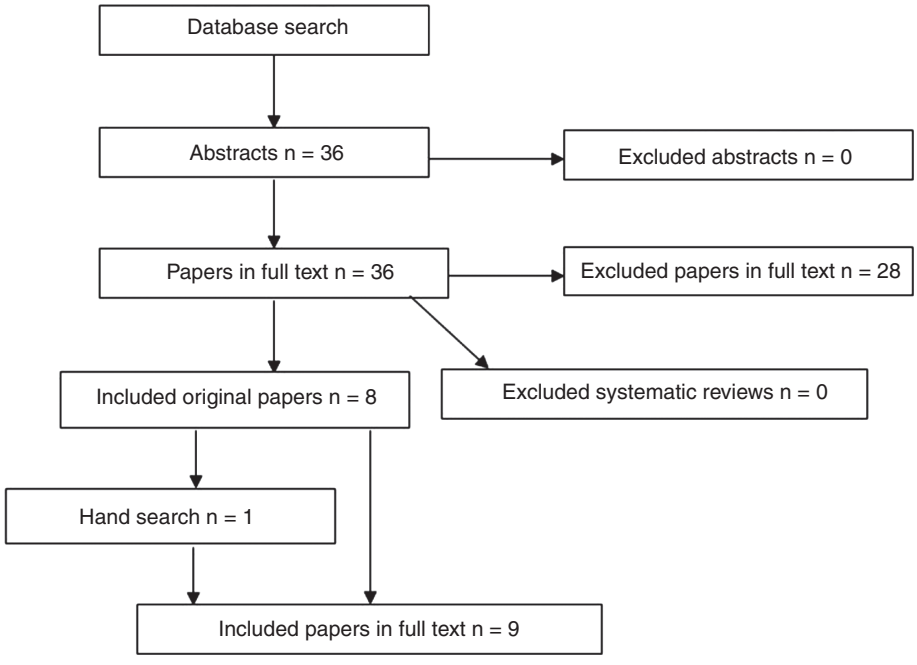

Figure 2. Flow chart of the literature search and selection.

Table V. Excluded studies, main reason for exclusion.

Reference	Method	Main reason for exclusion
Anastassiadouand Heath [18]	Semi-structured interview	Project question not addressed
Anastassiadou et al. [19]	Semi-structured interview	No qualitative analysis
Berg et al. [20]	Structured interview	Methodological study
Blackmore et al. [21]	Semi-structured interview	Project question not addressed
Bower and Scambler [3]	Narrative review	Narrative review
Brondani et al. [22]	Focus groups	Methodological study
Cronin et al. [23]	Semi-structured interview	Project question not addressed
Dong et al. [24]	Interview	Project question not addressed
Fitzgerald et al. [25]	Focus groups	Project question not addressed
Friedman et al. [26]	Iatrosedative interview	Project question not addressed
Gotfredsen et al. [27]	Semi-structured interview	No qualitative analysis
Gregory et al. [28]	Grounded theory	Methodological study
Hawkins et al. [29]	Structured interview	Project question not addressed
Hiramatsu et al. [30]	Interview	Project question not addressed
Kanno et al. [31]	Structured interview	Methodological study
Kwan and Holmes [32]	Focus group interview	Project question not addressed
Leles et al. [33]	Interview	Project question not addressed
McKenzie-Green et al. [34]	Interview	Project question not addressed
Maupomé et al. [35]	Semi-structured interview	Project question not addressed
McGrath and Bedi [36]	Interview	Methodological study
Murray [37]	Interview	Project question not addressed
Obrez and Grussing [38]	Focus group interview	Project question not addressed
Paulsson et al. [39]	Grounded theory	Project question not addressed
Sandberg et al. [40]	Semi-structured interview	No qualitative analysis
Schou and Eadie [41]	Informal group discussions	Project question not addressed
Silverman et al. [42]	Focus interview	Project question not addressed
Sussex et al. [43]	Interview	Project question not addressed
Waplington et al. [44]	Interview	Project question not addressed

stop yourself from outbursts of laughter, as there is always a risk the tooth falls out. But like I said, after so many years you become inventive. No doubt about that [7].

Or finding a coping strategy:

I suddenly thought this is silly. I've got to pull myself together. I realized there are other people much worse off than me—everything is relative [10].

Some informants blame themselves.

I felt I ought to have bothered more and I keep on thinking this [10].

The second third-level theme: Restored quality-of-life (after oral rehabilitation). Six studies report what has happened after oral rehabilitation and these narrations reflect feelings opposite to those related to being or becoming edentulous. Function and self-image improve [7–9,11–13].

- *Improved function* has three first level themes: eating and the pleasure of eating, clarity of speech and attractive facial expression. It can be exemplified in terms of being able to whistle, smile, laugh and kiss.

I can taste now. I can taste the meat, vegetables, and I enjoy my food more and I appreciate food more [12].

My speech has got better, I speak and people understand what I say, people listen to you more [8].

Now I can kiss again and it was a long time since I did that [8].

I can whistle the dog! . . . I have never mastered not being able to whistle without my teeth [13].

- *Increased self-esteem* has three first-level themes: self-confidence, social confidence and regained self-image. Although oral rehabilitation is undertaken primarily to restore oral function, the patient also perceives other benefits, such as regaining the potential of one's previous social life and a feeling of being a whole person again.

Table VI. Included studies, patients' perceptions.

Reference, Country	Material method Analysis method	Informants	Results	Summary	Study quality	Comments
De Palma and Nordenram [8], Sweden	Transcribed in-depth interview. Phenomenological-hermeneutic method.	8 subjects (6 m, 2 f). $\bar{x}$ = 54 years. Homeless men and women in Stockholm admitted for treatment at a public dental specialist clinic for homeless individuals with varying number of missing teeth	6 themes. Neglect of oral health, Social functions, Social competence, Self-esteem, Self-confidence, Oral function. The whole body. Normal appearance. Courteous reception/respect.	Oral health is strongly associated with human dignity. During rehabilitative phases, dental professionals clearly have a positive impact on the overall recovery of homeless individuals.	Moderate	The results could have been more clearly presented. The analysis could have been more rigorous.
de Souza e Silva et al. [9], Brazil	Transcribed semi-structured in-depth interview 6 months after insertion of dentures. During the interview the respondents were confronted with a frontal photo taken before start of treatment and a new one taken at the interview so that they could view the before and after images on a computer screen. Content analysis.	12 selected patients, to include both sexes of varying age, those who had never used complete removable prostheses or those who already used CD but needed them replaced. Patients not further presented.	Three thematic categories • visual impact of the dentures • satisfaction with the prostheses • dissatisfaction with the dentures	In some responses dentures may well improve the quality-of-life of the edentulous person. It helps to restore one's self-esteem and dignity and brings back the feeling of completeness and re-adaptation to social integration.	Moderate	The content analysis does not differentiate manifest and latent contents in the transcribed texts Analysis method not well described. The Public Health system in Brazil has not been able to meet the demands for oral health and people lose their teeth prematurely. Implants is an Utopian target for the system that only is willing to invest in conventional complete dentures.
Fiske et al. [10], UK	Transcribed in-depth interview. Qualitative approach.	50 individuals (14 m, 36 f). $\bar{x}$ = 69.9 years. Toothless patients who seem to be well adapted to their dentures. Dentures in 3 months–57 years.	10 main themes • bereavement • self-confidence • appearance • self-image • taboo • secrecy • prosthodontic privacy • behavioural change • premature ageing • lack of preparation.	Loss of teeth like loss of any body part leads to a process of reactions (cf Kubler-Ross) • grieving • coping with the acquired disability • emotionally re-defining the self.	Moderate	The analysis is not fully described and could have been further developed. This is an early qualitative study within this area and it may partly explain the methodological weaknesses.

Table VI. (*Continued*).

Reference, Country	Material method Analysis method	Informants	Results	Summary	Study quality	Comments
		$\bar{x}$ = 18.4 years.				
Graham et al. [11], UK	Transcribed in-depth interview. Computer software packages for qualitative analysis: Atlas.ti and N.Vivo.	Patients wearing removable partial dentures (n = 17). (Dentists who had treated these patients, n = 16).	2 themes with 6 codes/categories? Appearance to • avoid social stigma • reflect social identity • perform social communication. Physical function of the mouth • shape of the face • smiling • eating (tasting, and feeling the food),	Patient opinions. The mouth has a social function as a gap reflects a social identity. The patients' understanding of appearance suggested a rather different interpretation of factors normally understood as aesthetic. Normal appearance to avoid social stigma. *Patients' understanding of physical function centred on the mouth rather than the teeth (as the dentists did) and thereby perform essential social functions rather than ability to chew, load of remaining teeth, etc.	Moderate	Method well described. Lack of overview, hard to follow the results.
Robinson et al. [12], UK	Interviews in focus groups and semi- structured transcribed in depth interviews. Content analysis.	Recovering drug users. 40 individuals (26 m, 14 f). 21–52 years. Drug users for 8–32 years.	Themes and codes/categories? Avoid withdrawal • full time job • low self-esteem. Drug use and health • Drugs break down your defense system. Drug use and oral health • Blame the drugs. Diet • crave for sugar • no time for shopping, fast food • all money goes to drugs. Health seeking behaviour	The lifestyle of drug users may contribute to oral health problems and low use of dental service because low priority of oral health relative to the need to obtain and use drugs, dental fear self-medication and organizational problems in their lifestyles.	Moderate	'All three authors reviewed the data'. Data analysis not clearly shown. Hard to follow the results.

Table VI. (*Continued*).

Reference, Country	Material method Analysis method	Informants	Results	Summary	Study quality	Comments
			• petrified of dentists • negative experiences • all you think of is scoring your drugs • unable to keep an appointment • self-medication • I want to keep it fit now (non-addict identity).			
Smith et al. [13], UK	Transcribed semi-structured in depth interviews. Qualitative interview analysis.	23 individuals with partial dentures (14 m, 9f). 35–70 years. Wearing dentures for 3 months–35 years.	Key theme headings. Initial fitting of partial dentures • information • introduction. Advantages and difficulties of denture use • appearance • self-assurance • self-confidence • loss of youth • embarrassing social situations • unexpected benefits (able to whistle). Patterns of denture use • Balancing the benefits against the discomfort. Seeking help for problems with dentures • Dentist's willingness to help • Dentist's patience • Atmosphere which encourages communication.	Main benefit of partial dentures was improved appearance and confidence. The mouth is extremely important to a person's concept of self. Information and supportive communication by the dentist are highly valued by the denture wearers and can promote effective use and appropriate help-seeking.	Moderate	Strategic variation? Topic guide not shown. Only one analyser = the interviewer. Lack of overview, hard to follow the results.
Trulsson et al. [7], Sweden	Transcribed in depth interviews. Grounded theory.	18 individuals (8 m, 10 f). 58–86 years. $\bar{x}$ = 71 years. Edentulous patients treated at The Brånemark clinic.	3 categories with sub-categories: Becoming an 'abnormal' person • Lack of dental awareness earlier in life • Feelings of shame and guilt	Description of changes in self-image starting with the subjects' increasingly deteriorating dental status, followed by a period of having to live and cope with a denture and, finally, living	High	Relevant strategic selection of respondents. The method is well described.

Table VI. (*Continued*).

Reference, Country	Material method Analysis method	Informants	Results	Summary	Study quality	Comments
			• Physical pain. Becoming insecure • Physical suffering • Feelings of shame • Practical problems • Less attractive. Becoming the person I once was • Social security • Regaining attraction • Good dental status • Feelings of gratitude.	with a fixed prosthesis. The motivating force behind the decision to undergo treatment with a fixed prosthesis seems to be a desire to restore dental status and also to recapture attractiveness, self-esteem and positive self-image.		

Now, thank God, I go out, nobody holds back. My God, I go out a lot! I don't stop, now I don't stay home quiet! [9].

... having new teeth has helped me to walk tall again. I can go up and talk to people, I have a whole new self-confidence [8].

In several citations there are thoughts that a person without teeth is disabled and that treatment restores normality:

The whole life quality has changed enormously and I've got back my self-assurance. Thanks to it I am back to normal [7].

Discussion

The meta-synthesis in this study was based on seven original studies: one of high study quality [7] and six of moderate study quality [8–13]. As a scientific base for the 16 first level themes, 10 themes originated from the study of high quality and 42 themes from the six studies of moderate quality. Each first level theme was based on at least two studies. Of the six second level themes, *compromised function* was based on three studies of moderate quality. The themes *lower social status*, *diminished self-esteem* and *managing loss* were based on five studies each including the study of high quality, while *improved function* was based on five studies of moderate quality. Increased self-esteem was based on four studies including the one of high quality (Table VII). Hence, all second level themes were established on a solid scientific base.

Although the interviewees are of different age, ethnicity and social background, the reported experiences of losing teeth have common characteristics that can be broadly interpreted as loss of quality-of-life. Indeed, this experience seems to have a major impact on most aspects of the interviewees' lives, with considerable effects on both self-esteem and social life. The clinician's awareness and understanding would probably lead to better results, in terms of individualized treatment, faster adaptation and more satisfied patients due to the improved communication.

Two things are noteworthy regarding the responses from people who have undergone successful rehabilitation. There are no comments about the relief of not having tooth ache anymore and no one mentions improved appearance *per se*. Appearance is mentioned when informants look back after treatment and can be latent in citations as 'feeling reborn' or 'regained the joy of life', but these feelings are not further explained. It may be that the absence of pain and the improved aesthetics are regarded as so central that they warrant no further reflection. However, central as these aspects may be, perhaps communicative and sensory improvements are perceived as more important. According to a qualitative interview study of the parents of seriously disabled children [16] it was also evident that oral function was the major issue needing to be addressed

Table VII. First, second and third level themes as a result of the analysis (studies of high quality are marked in italics).

First level themes	Second level themes	Third level themes
Loss of function [8,10,13]	Compromised function [8,10,13]	Loss of quality-of-life [7–13]
Social stigma [7,8,10,13] Loss of social competence [7,8,10,13] Anxiety over disclosure [7,10,11]	Lower social status [7,8,10,11,13]	
Lack of self-confidence [7–10,13] Appearance [7–10,13] Grief/shame [10,13]	Diminished self-esteem [7–10,13]	
Adaptation [7,8,10,11] Self-reproach [8,10,11,13] Making excuses [7,12]	Managing loss [7,8,10,11,13]	
Eating and joy of eating [8,12,13] Speaking [8,9] Facial expression [8,11]	Improved function [8,9,11–13]	Restored quality-of-life [7–9,11–13]
Restored self-confidence [7–9] Restored social confidence [7–9] Restored self-image [7,8,12]	Increased self-esteem [7–9,12]	

and there was no comment on improvement in appearance: the narratives in the study emphasized the importance of better nutrition and better communication for the children after prosthodontic treatment.

Since oral status is regarded as so important, it might seem surprising that some people do not always pay adequate attention to their oral health, for instance, by regular dental visits. A number of potential explanations can be found in the included articles. Financial restraints are one. The theme is discussed in only one study of English patients who for financial reasons chose removable partial dentures instead of better but more expensive fixed constructions [13]. In some interviews the informants talk about why they have neglected their oral hygiene. In two of the studies the informants are homeless; many are drug abusers [8,12]. Under such conditions, dental care is often neglected because of other priorities and is limited to emergency treatment. These interviewees had experienced discourteous reception by dental personnel and were reluctant to face such a demeaning situation again [8].

In the Swedish studies, shame was one reason for avoiding dental care [7,8]. In contemporary Swedish society it is unusual for people to have gaps due to missing teeth or poorly functioning removable dentures and, therefore, visible signs of poor oral health are rare and become a social stigma.

Dental fear as a reason for avoiding care is reported in two studies but not mentioned in the others [7,12]. In a quantitative questionnaire study, 45 patients were offered implant-supported mandibular over-dentures free of charge, but 12 chose a conventional removable denture, deterred by the anticipation of pain associated with surgical treatment [17].

Limitations

The analysis resulting in the synthesized themes described above was based on relatively few studies. However, the search was very extensive and we suggest that most of the available studies have been identified and read. Furthermore, the studies that were included reported similar life experiences by the group of dental patients concerned.

Gender aspects were not specifically analysed or discussed in any of the included studies. As this is a relatively new research area, to date there are only a small number of published qualitative studies. There is room for improvement with respect to the application and relevance of systematic reviews within dentistry [3].

Conclusions

The meta-synthesis in this study was based on seven original studies: one of high study quality and six of moderate study quality. Hence, the results could be considered as scientifically solid.

The experience of loss of teeth often leads to a loss of quality-of-life, including compromised function, loss of social status, diminished self-esteem and coping/managing tooth loss. For many patients, oral rehabilitation signifies a return to a normal lifestyle and considerably improved quality-of-life: enjoying food, participating in conversation and laughing with others, without the constant anxiety of disclosure. This is best captured not in terms of replacing the missing teeth, but in broader terms of experiencing restoration of oral function and all that is associated with it. The citations from the analysed studies

express in words the broad spectrum of positive effects on these patients' lives.

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