# Osteoporosis risk assessment in primary dental care—The attitudes of Swedish dentists, patients and medical specialists

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# Osteoporosis risk assessment in primary dental care—The attitudes of Swedish dentists, patients and medical specialists

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## Abstract

**Objective:** To explore and identify the attitudes of dentists, patients and medical specialists regarding implementation of osteoporosis risk assessment into Swedish primary dental care.

**Background:** Osteoporosis is a major health problem leading to fragility fractures. As shown in academic-based research, dental radiological examination can be used for osteoporosis risk assessment. A substantial number of patients undergo radiographic examinations in primary dental care each year, but little is known about implementation of osteoporosis risk assessment in this setting.

**Materials and methods:** A qualitative research approach using focus group discussions and manifest content analysis was applied. Five focus groups with dentists and representatives from patient support groups and a single individual interview with one medical specialist were included in the sample.

**Results:** From the manifest content analysis, three categories emerged: (a) barriers to change in practice, (b) benefits to change in practice, and (c) needs and requirements prior to change in practice. Most participants felt that there was insufficient knowledge of osteoporosis as well as a heavy existing workload. A concern was expressed about medical practitioners' willingness to take on responsibility for patients referred by dentists. Representatives from patient support groups highlighted a lack of knowledge about osteoporosis among both the general public and the medical professionals. Clear guidelines and improved communication channels between stakeholders would have to be established to ensure a smooth treatment path for patients.

**Conclusion:** Despite interest in osteoporosis risk assessment in primary dental care, there are political, workflow and educational barriers that must be overcome for successful implementation.

KEYWORDS

osteoporosis, primary dental care, qualitative study, risk assessment

## 1 | INTRODUCTION

Osteoporosis is a disease of bone causing its microstructural deterioration and loss of mass[1] leading to weakening of the skeleton and increased risk of fragility fractures, particularly so of the vertebrae, forearm, hip and proximal humerus.[2] The economic burden of fragility fractures in Europe has been estimated at €37 billion, and the costs are expected to increase by 25% by 2025.[3]

A major challenge in managing osteoporosis is the difficulty in identifying affected individuals before the condition is established and fracture has occurred. At present, the diagnosis of osteoporosis mainly relies on measurement of bone mineral density (BMD) at the hip and spine by dual-energy X-ray absorptiometry (DXA).[2] The principal difficulty with this method is that BMD based on DXA alone in prediction of fracture risk has high specificity but low sensitivity. The performance characteristics of the test can, however, be improved by the concurrent consideration of risk factors (eg age, low body mass index and previous fragility fracture) that operate independently of BMD.[3]

Dental radiographs show not only the teeth but also part or all of the bone tissue in the jaws. Results achieved in a well-controlled academic environment indicate that these radiographs may be used as part of an osteoporosis risk assessment.[4] Much interest has focused upon the cortical bone layer at the lower border of the mandible on panoramic radiographs.[5] Mandibular cortical thickness measured on panoramic radiographs was shown to be the single most efficacious measurement in identifying women with osteoporosis in a large European multicentre study.[6] Also, assessment of trabecular pattern using intraoral[7] and panoramic radiographs[8] has shown statistical validity in identifying individuals with osteoporosis.

A substantial number of patients undergo dental radiographic examinations each year.[9] Given that the radiographs are taken for dental diagnostic and treatment purposes, an opportunity exists to incorporate osteoporosis risk assessment into dental clinical practice using dental radiographs already taken in the dental setting.

Few studies have been published reporting attitudes towards dentists performing health promotion activities or tests for medical conditions. The feasibility of blood glucose testing by dentists for diagnosis and monitoring of diabetes has been investigated by means of either questionnaires[10,11] or in-depth interviews.[12] Attitudes towards smoking cessation by dentists have been investigated through surveys[13,14] or semi-structured interviews by phone[15] but to our knowledge not through a focus group approach. None of the studies explored all stakeholders but rather chose to focus on either dentists[13,14] or patients.[11,16]

This study is part of a larger project titled "Implementation of osteoporosis and fracture risk assessment in primary dental care" inspired by quality implementation framework.[17] The overriding goal of the project is to implement an innovative technique, and this study is part of the self-assessment strategy in order to investigate the needs, fit and readiness. Implementation of new types of patient management in clinical practice may be influenced by factors such as cognitive-behavioural barriers, attitudinal barriers and professional barriers.[18] It is essential to explore the attitudes of all stakeholders on what might obstruct or facilitate the process, before implementing it, and thus increase its chance of success by adjusting the implementation strategy.

The aim of this study was therefore to explore and identify the attitudes of dentists, patients and medical specialists regarding benefits and barriers to the assessment and the implementation of osteoporosis detection into Swedish primary dental care.

## 2 | MATERIALS AND METHODS

### 2.1 | Ethical considerations

The Regional Ethical Review Board in Lund was contacted in 2014. According to the instructions received, ethical approval was not required given that no identifying features were reported. The study followed the ethical considerations of the Declaration of Helsinki. Participation was voluntary and information about the study, formulated according to the general outlines provided by the Regional Ethical Review Board, was provided prior to the interviews. Informed consent was signed by all participants.

### 2.2 | Study setting and participants

To gather the participants' thoughts and experiences on the subject area, an inductive qualitative approach was chosen based on focus group discussions (FGDs) and manifest content analysis. The study was conducted in southern Sweden over a 12-month period starting in the autumn of 2014. Representatives of Swedish general dental practitioners (GDPs), patients and medical specialists were recruited, with a total of 17 participants (14 women and 3 men). After this, no new insights were provided[19] and no further focus groups were therefore considered necessary.

We recruited GDPs from private as well as from public clinics because both sectors have equal prevalence in Sweden and are subsidised to the same extent by the state. Since there are minor differences between counties in the organisation of public dental care, we recruited GDPs from three different counties in Sweden.

As recommended in other studies, we deliberately chose participants who knew or worked with each other in order to ease the conversation and make the participants feel comfortable.[20,21] We contacted the heads of clinics via email, and they forwarded the invitation to participate in the focus groups together with information about the study to all practitioners in their clinics. Four GDPs from a private clinic formed the first focus group, four GDPs from a public clinic formed the second focus group, while the third focus group consisted of four heads of different public clinics in one county (unrelated to participants of the previous two focus groups). In the last group, however, one of the participants withdrew from the study due to a family emergency.

Patients were selected through purposive sampling and consisted of representatives from local osteoporosis patient support groups from different parts of Sweden. We considered these representatives to be well-informed on the topic and their input valuable. Chairs of the support groups were contacted via email, and the invitation to participate in the focus groups was forwarded to all members of the organisations. All who agreed to take part were women above the age of 70 years. We scheduled meetings with two focus groups, each consisting of four participants, but eventually one dropped out from the first group and two from the second due to health issues, resulting in one group of three and one of two participants, respectively.

In terms of medical practitioners, our primary goal was to recruit physicians from primary healthcare clinics. However, after multiple attempts of reaching out to general practitioners (GPs) from different clinics in different parts of the country without success, we instead invited medical specialists in the field of osteoporosis. Since there are very few such experts in Sweden, we were only able to perform a single individual interview with one representative for this group, using the same interview guide as for the focus groups.

## 2.3 | Data collection

We chose focus group discussions because we were looking for exchange of opinions on a specific topic (ie implementation of osteoporosis risk assessment in primary dental care) with minimal facilitation and interaction of the research team in the process.[22] Five focus groups were performed based on a semi-structured interview guide that consisted of open-ended questions and was developed using relevant literature and consultations with public health experts. The guide was pre-tested on the first focus group of dentists. This only resulted in minor changes of the probing questions, and we therefore decided to include the data collected in the study.

Focus group discussions were conducted by a moderator (author JG, dentist) and an observer (author CL, professor who has specialised in the topic of osteoporosis risk assessment in dentistry). The moderator was responsible for tape recording the discussions and asking questions from the interview guide. The observer took notes and ensured that the discussions progressed smoothly and that all topics were covered. To ensure that participants felt free to express themselves openly, only the moderator, the observer, and persons who were part of the FGD were present during the discussions. Focus groups with dentists from private and public practices were held in their home clinics, while the one with heads of the clinics was held in the regional headquarters. Representatives from patient support groups came from different parts of southern Sweden, so we chose to arrange the first focus group at Malmö University and the second at a conference centre in Gothenburg. The single interview with the medical specialist from the field of osteoporosis was carried out in a private hospital setting.

Prior to the FGD, all participants received an e-mail with an information letter explaining the topic, objective of the study and latest research findings. The letter also included a short description of focus groups. Every FGD began by the researchers greeting, welcoming and thanking the participants for their contribution. We briefly repeated the content of the information letter to ensure that all participants understood the principles of the study and clarified any uncertainties. We asked the participants to contribute to the discussion and to take turns so that everyone could express their thoughts. We encouraged them to explain their views openly and in their own words.[23]

Discussions focused on the participants' perceptions about the introduction of osteoporosis and fracture risk assessment into primary dental care, with regard to the benefits and barriers as well as to the referral pathway and arrangement of the workflow. We started with a few general questions such as "What do you think about introducing osteoporosis and fracture risk assessment into general dental practice? Do you see any advantages? Might there be any difficulties?", and let the participants interact. Probing and follow-up questions were asked if needed. The individual single interview with the medical specialist followed the same procedure. All focus groups and the single interview were conducted in Swedish and lasted for approximately 40 minutes.

## 2.4 | Analysis

The transcriptions were analysed through manifest content analysis.[24,25] The first author (JG) transcribed the interviews verbatim. Quality control of the transcripts was performed by listening to the recording while reading the text of the transcripts. The audio tapes and the transcriptions were reviewed and thoroughly discussed by author JG and author CL before the analysis started. The manifest content analysis was performed in three phases.[24,25] In the first phase, all transcriptions were analysed directly after each focus group, commencing with thorough reading several times to get an overview of the whole text. In the second phase, meaning units, that is words and phrases meaningful to the aim of the study were identified in the text and highlighted. After identification of all meaning units, these were condensed into codes without changing the original meaning. The first phase and second phase of the analysis were performed by author JG alone, but the findings which emerged during the analysis were regularly discussed with author CL. In the third phase, the codes from all the transcriptions were gathered for comparison. They were then sorted by authors JG and CL together into three categories. Special attention was paid to establishing clear differences between (external homogeneity) and similarities within the categories (internal homogeneity).[24] Two of three categories each had three subcategories. An example of the analysis process is presented in Table 1. An experienced qualitative researcher (author LP) was consulted as required.

Translation of the quotations for the purpose of citation in the manuscript was conducted by author JG. Actual speech was translated word by word. The native English-speaking co-authors were consulted when necessary.

**TABLE 1** Illustration of the analysis process

| Raw data | Codes | Subcategories | Category |
|---|---|---|---|
| ...what are we supposed to say about the panoramic x-rays? Are we supposed to comment on it, are we not supposed to comment? Is the licensing course enough for it? | Lack of knowledge and routine | Work-related obstacles | Barriers to change in practice |
| ...question is if it falls under our license, I don't know that. We are not allowed to diagnose it, but are we supposed to comment on it in some way in the future? | Uncertainty about future responsibilities | Additional challenges and responsibilities | |

## 3 | RESULTS

Overall, the participants were eager to share their views and expressed their opinions openly. Opinions differed between general dental practitioners from private and public sectors. The medical specialist in osteoporosis shared views and thoughts, which were mostly in line with those of the private dental clinicians. The representatives from different support groups expressed quite similar experiences and opinions, and little variation emerged between representatives from different counties.

The findings of the manifest content analysis are described in three categories relating to the main topics covered in the discussions: (a) barriers to change in practice, (b) benefits of change in practice, and (c) needs and requirements prior to change in practice. Quotations are presented in the text to provide the reader with an opportunity to examine the original data and thereby establish confirmability.

### 3.1 | Barriers to change in practice

This category includes the subcategories: knowledge gaps on osteoporosis, work-related obstacles, and additional challenges and responsibilities.

#### 3.1.1 | Knowledge gaps on osteoporosis

Most of the dentists from public practice did not feel confident in their ability to provide the risk assessment or counselling on osteoporosis due to insufficient knowledge of what osteoporosis is, how it is diagnosed and treated, and its consequences. They stated that they had never heard of or learned about any research showing that dental X-rays could be used to detect individuals with osteoporosis and risk for fracture.

> *Why did no one tell us about this earlier? It would have been good if we had learnt about this during our dental education, but it was barely discussed.*
>
> *(dentist from public practice)*

Dentists from both public practice and private practice expressed concerns about the consequences of implementing osteoporosis risk assessment in dental practice since knowledge on the topic is lacking and almost entirely limited to academia. The medical specialist expressed the same concern about primary healthcare centres and identified knowledge gaps also among primary healthcare practitioners.

> *Osteoporosis is still unfortunately a disease that people don't think that much about, until it causes serious problems. It is an underdiagnosed condition and you can have osteoporosis for many years without knowing, until you get compression fractures*
>
> *(medical specialist)*

The representatives of the patient support groups expressed similar opinions. They mentioned that osteoporosis is a disease that is widely unknown to the public. Some of them only learned about it because they had suffered from an osteoporosis-related fracture. Others learned about it by coincidence or were asked about it by acquaintances directly affected by the disease. According to them, the lack of knowledge about osteoporosis is not only a problem among the general public but also among medical professionals.

> *A dream situation would be (to have) osteoporosis clinics. Sending someone to a healthcare centre, where the doctor does not know too much about it, is just a waste of time and resources*
>
> *(representative from patient support group)*

#### 3.1.2 | Work-related obstacles

Dentists from public practice felt pressured by time. Moreover, they were already involved in several other general health promotion activities such as tobacco control or cessation, diabetes prevention and high blood pressure prevention.

> *We already feel overwhelmed by everything that needs to be included in the dental examination. A lot of steps have to be completed. I can only imagine how people are going to react when they learn there is another thing to add to the list*
>
> *(head of a public clinic)*

Dentists from public practice and heads of public clinics in particular had other revenue requirements and felt it would be

hard to incorporate osteoporosis risk assessment into the dental examination if they did not receive any compensation for it. Any additional task was perceived as "very tiresome." Their solution was to charge for the service, which would allow them to prolong the visit.

On the other hand, representatives from patient groups were concerned that they would have to pay more for a visit they already considered to be expensive. They would prefer that the new service was included within the existing price of dental examination. If that were not possible, they were prepared to pay an additional cost no greater than €10-12.

> *If it was billed as a patient fee within the healthcare system it would be great, exactly as PSA (Prostate Specific Antigen) and similar stuff are. We pay 100 SEK (≈ €10 at the time of the study) for a mammography examination, which is a reasonable amount*
>
> *(representative from patient support group)*

Another issue concerned licensing and scope of practice. Due to limited knowledge about osteoporosis, GDPs expressed a worry on how the workflow including osteoporosis risk assessment using dental radiographs should be structured.

The general opinion was that the referral system to medical clinics might also be an obstacle to any change of practice. Some dental professionals had already tried to introduce osteoporosis risk assessment locally in their practice but considered it hard to refer patients at risk to a doctor. They felt medical professionals were not taking them seriously. At present, there is no formal referral path between dental clinics and medical centres. Moreover, there is no digitalised communication, so patients who are found to be at risk of osteoporosis as part of a dental examination would be handed a report of the result from the dentist and were then supposed to search for medical help on their own.

Representatives from patient support groups did not consider it a good idea that they would need to search for medical help on their own. They expressed a worry that many patients would not have the energy for it. They had the experience that medical centres could be hard to reach and said that patients have to be stubborn to get through. They might also feel neglected and perceive that their problems were underestimated.

> *One thing I can say with all certainty is that you have to fight for attention (…) It is tough for those who are old and do not have anybody to take care of them. I don't know how they manage it*
>
> *(representative from patient support group)*

### 3.1.3 | Additional challenges and responsibilities

Due to the lack of a functional workflow and referral path in the scope of practice, dental practitioners were concerned about taking additional responsibility for the patients. They required clear guidelines that specified who should take responsibility for different parts of the risk assessment and treatment process for osteoporosis. Previous experiences of health promotion programmes, which required collaboration between dental and medical care, had been unsuccessful. Thus, if osteoporosis risk assessment was implemented in the future, dental professionals expressed concern that they would be forced to take major responsibility for patients at risk.

> *…the question is if it falls under our license; I don't know that. We are not allowed to diagnose it, but are we supposed to comment on it in some way in the future?*
>
> *(public clinic dentist)*

The alternative would be to leave the responsibility to the patient, even though this might not be an optimal solution. Some patients at risk might not seek health care. On the other hand, being adults and informed by dental practitioners, patients should be able to do so.

Both dental practitioners and the medical specialist were concerned about general medical practitioners' unwillingness to take on responsibility for patients referred by dentists. The osteoporosis specialist described medical healthcare centres as being like "small islands" where some doctors were very interested and active in cooperation with other professions, while others were not and thus might not appreciate new patients being referred by dentists.

## 3.2 | Benefits to change in practice

Participants discussed the benefits of the proposed change of practice and agreed that preventing osteoporosis-related fractures would be beneficial for society, as well as for the individual person. Heads of dental clinics expressed a hope that the proposed change of practice would bring dental and medical fields closer together and help improve communication between dental practice and primary healthcare centres that was at present missing.

Dental practitioners considered that osteoporosis risk assessment could benefit their practice for different reasons. Public practitioners saw it as a potential source of additional income, as they expected to receive compensation for it. Private practitioners, on the other hand, were more willing to include it in the current price of the dental examination and saw it as a competitive attribute in attracting more patients.

> *Every time we talk about it more patients come and ask for it. If it were to become widely known, then it would probably be of great interest I think among many older people. It is really very rewarding to do it, both this (osteoporosis risk assessment) and other health promoting initiatives. One would gain a lot of good will from it*
>
> *(dentist from private practice)*

Representatives from the patients support groups expressed similar views. They considered the initiative to be of high value due to the clear benefit to society, directly related to lowering healthcare costs in the long run, but also considered it a personal benefit. They had all joined the support group after being diagnosed with osteoporosis or after suffering a fracture. Since osteoporosis is a silent disease, they had not been diagnosed until after receiving several low-trauma fractures, in the majority of cases. Those fractures caused different levels of impairment which, in the participants' opinions, could have been avoided if they had been diagnosed sooner. Patients expressed their belief in a better future if osteoporosis risk assessment by dentists succeeded. This was based partly on their previous experiences but also on their trust in the skills and interest of dental professionals.

> *I think it is a brilliant way of discovering osteoporosis if the dentists really can see it (diagnose osteoporosis), because many more (people) go regularly for check-ups to the dentist but never visit their doctors for osteoporosis. You just have no idea that you have it*
>
> *(representative from patient support group)*

## 3.3 | Needs and requirements prior to change in practice

This category includes the subcategories: political changes to the healthcare system, filling educational and motivational gaps, and routines concerning workflow.

### 3.3.1 | Political changes to the healthcare system

In order for the implementation process to be successful, changes in the political system were considered necessary. The discussions extended from decisions taken at national level to those made at county level. For example, dental practitioners required clear guidelines from the Swedish National Board of Health and Welfare that would specify who should take responsibility for different parts of the osteoporosis risk assessment, diagnosis and treatment process. County councils, however, should decide on the division of resources to permit osteoporosis and fracture risk assessment to take place in primary dental care.

### 3.3.2 | Filling knowledge and motivational gaps

Participants also emphasised the need for education of dental and medical professionals as well as the general public, about osteoporosis and its impact on fracture risk. Dental practitioners from both private practice and public practice asked for more detailed courses or workshops about the disease itself and the software to be applied on dental radiographs to identify patients at risk of osteoporosis fractures, so they could fully understand the impact on the patients affected.

> *I attended a lecture on osteoporosis and it really affected me. I had no idea. They talked about how much quality of life declines after an osteoporosis-related fracture (…) how handicapped you can become. And if you can prevent this…everyone should know*
>
> *(dentist from private practice)*

Dental practitioners from private practice on the whole appeared very motivated towards implementing the concept of osteoporosis and fracture risk assessment, whereas practitioners from public practice needed to be allowed to charge for this extra service, due to the previously mentioned revenue implications. Participants agreed that a low compensation at the level of €10-20 would be sufficient to compensate for the extra time spent performing the assessment.

> *It is a lot of goodwill for us, we do not need specific payment for it (…) because we can incorporate it into our budget estimation.*
>
> *(dentist from private practice)*

### 3.3.3 | Routines concerning workflow

Dental practitioners expressed the view that the process of assessing risk for osteoporosis should be incorporated into the dental examination as easily as possible. It should be automated to reduce time implications. In addition, it would be necessary to establish a proper referral pathway so that each practitioner understood his or her responsibilities. A connection between dental practices, primary healthcare centres and hospitals needed to be established so that the patient could smoothly move along the subsequent stages of the examination and treatment pathway. The connection should preferably be digital, since too much paperwork would require additional time and resources. Dental practitioners favoured the use of predetermined referral templates that could be efficiently completed. Moreover, all information to the patient and respective practitioners after particular steps in the referral pathway were expected to be fully automated.

> *(It should be) as easy as just uploading a regular dental x-ray and then a window pops up with an answer or a warning, to embed it in the examination*
>
> *(dentist from public practice)*

## 4 | DISCUSSION

The present study aimed to explore and identify factors that dentists, doctors and representatives from osteoporosis patient support groups in Sweden considered crucial in the process of implementation of osteoporosis risk assessment in primary dental care. An inductive qualitative research approach primarily using focus group discussions was applied. To the authors' knowledge, this is the first study in the field. No organised implementation of osteoporosis risk

assessment and evaluation of attitudes has previously taken place in Swedish primary dental care. Implementation of academic findings into everyday practice is a necessary but relatively new field of science.

Seventeen participants gave their opinions on the issues related to potential obstacles and benefits to implementation of dental osteoporosis risk assessment, 16 in five focus group discussions and one in the single interview. Moreover, they made suggestions on needs and requirements prior to a potential change in practice, just as they considered local factors in the context of broader society. We chose to work with pre-existing groups such as colleagues or friends who already knew each other through working or socialising together. On one hand, such approach is discouraged by standard market research as it is argued that familiarity tends to inhibit disclosure and that previously established relationships could have negative influence on the discussion and group dynamics.[26,27] On the other hand, there are several publications that support such practice.[20,21] Using pre-existing groups gives the possibility of observing interactions approximated to naturally occurring data. Some studies explicitly recommend use of such natural groups.[21] The fact that research participants already know each other has the additional advantage that friends and colleagues can relate to each other's comments and encourage each other to elaborate their thoughts.

Dental professionals expressed the desire to conduct osteoporosis risk assessment side by side with their daily activities, which agrees with previous results on other health-promoting interventions in a dental setting.[10,14] There was, however, clear frustration due to work burdens and perceived poor cooperation and support from medical professionals in primary healthcare centres. Providing incentives might help change these issues. Studies on dentists' attitudes towards smoking cessation confirm that lack of confidence, lack of time and lack of reimbursement were considered the main barriers to the implementation process.[14] On the other hand, it has also been shown that incentive-based performance improvements over the long term may be challenging.[28] As is common with monetary incentives, they may weaken the intrinsic motivation for performing a task. One way in which both dentists' and patients' intrinsic motivation may not be undermined is to introduce fees that just cover the costs of the provided service.[29,30]

Our study identified three major issues that were of crucial importance for the implementation process to succeed. First, the political setup of the healthcare system should be addressed. Second, the incorporated intervention should be preceded by education of all involved health professionals, just as educational support material for the general public should be provided. Third, the workflow in the referral pathway should be adapted into the scope of practice of the general dental practitioner.

We used a qualitative research design with FGD and manifest content analysis to acquire knowledge on a previously unexplored subject. The insights provided by this study highlight the value of a qualitative research design in exploring and understanding implementation of new and modern techniques in the field of dentistry. Focus groups using an interview guide with open-ended questions provided a deeper understanding of the implementation process and the broader socio-political context of the Swedish healthcare environment. Moreover, it allowed the participants to express themselves freely in their own words with minimum interaction from the research team.[22,23] Use of this methodology enabled us to capture a richer, in-depth knowledge of the participants' perspective on the subject. Using the same interview guide throughout the study enabled us to compare the findings, since the extracted meaningful units from all transcriptions could be coded and grouped into subcategories and categories together.[31] A similar research approach was successfully used to investigate oral health professionals' experiences on tooth brushing techniques[32] and the ability of the elderly to maintain their oral hygiene.[33]

An information letter covering the topic and aim of the study as well as the latest research findings provided a good basis for the participants to further discuss the issues and position themselves in relation to the statements. The information letter together with the interview guide contributed to the dependability of the study. Among the strengths was the use of two independent analysts and data triangulation, which enhanced the credibility of the results. By describing the research process in detail, we strived to facilitate transferability.[24]

As in the case of all qualitative studies, responses generated in the current study are typical of the participants, but not necessarily of dentists, patients and medical specialists in other parts of Sweden. Therefore, it is not known if the findings can be transferred to other groups or settings. Still, they may provide healthcare professionals and educators with deeper insight and knowledge. Second, we did not reach the goal of involving 4-5 participants in each focus group. A small number of employed GDPs at the selected clinics defined the limits of the size of the focus groups. Some participants' medical conditions made travel difficult. The fact that the focus groups were smaller than desirable may have limited the dynamic of the focus groups and the nature of the data collected.[34] Third, the primary goal was to recruit physicians from primary healthcare centres, but after multiple attempts we had to settle for an individual interview with a single medical specialist in the field of osteoporosis. This issue was confirmed by a study exploring general practitioners' and dentists' experiences and expectations of interprofessional collaboration, which concluded that while dentists were interested in extending collaboration, most GPs saw no need for collaboration.[35] Another issue that needs addressing is our observation that participants appeared to have more to say about obstacles rather than about benefits, even though the pitfall of researcher bias was actively addressed throughout the study. The interview guide was constructed through cooperation between two main authors using relevant literature and consisted of open-ended questions to avoid leading the participants to simply agreeing or disagreeing. To avoid influencing participants' responses, the researchers present strived for minimal interaction in the ongoing discussions between

the participants. Lastly, the authors did not consult dental educational programs. Implementation of techniques from already practicing clinicians is but one aspect of the implementation process. Education and training of clinicians within educational programs may alter the perspectives of clinicians; however, such programs may be barriers in uptake.

## 5 | CONCLUSION

From the general perspective of Swedish dental practitioners and patients, it is feasible to implement osteoporosis risk assessment in primary dental care using dental radiographs already taken for dental purposes. However, implementation processes require that they are continuously adapted as needed. The present study shows that barriers concerning workflow, education and the current arrangement of the Swedish healthcare system must be overcome for a successful implementation of osteoporosis risk assessment in primary dental care. Furthermore, clear guidelines and improved communication channels between stakeholders must be established to ensure a smooth treatment path for patients.

### AUTHOR CONTRIBUTIONS

All the authors participated in designing the outlay of the study. Joanna Gullberg and Christina Lindh performed the focus groups interviews and the interpretation of data. Lene Povlsen and Björn Axtelius who are both experts on qualitative research design were regularly consulted. All the authors contributed to drafting the paper as well as revising it critically after both submissions to Gerodontology. Moreover, Keith Horner and Hugh Devlin who are both native English speakers performed language check of the manuscript. All authors have approved the revised version of the manuscript.

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