Development of an Evidence-Based Prosthodontic Record: An Action Research Study

Motahareh Ahmadi, DMD, MSc[a]/Claude Lamarche, DMD, MSc[b]/Pierre de Grandmont, DMD, MSc[b]/Gilles Gauthier, DMD, MSc[c]/Louis de Koninck, DMD, MSc[c]/Elham Emami, DDS, MSc, PhD[d]

This study sought to develop a database in the field of removable prosthodontics by using a participatory action research method. Data collection consisted of a comprehensive literature review, focus-group discussions, and interviews. Applying action research methods ensures consideration of the needs, perspectives, and expertise of academia in the design and implementation of an evidence/research-based patient record, and academic educators are well placed to conduct such research. *Int J Prosthodont 2013;26:359–364. doi: 10.11607/ijp.3397*

Although the importance of practice-based research has been widely documented, this process advances slowly and faces several barriers, such as validity of the evidence and high costs of providing clinical data.[1] Therefore, strategies need to be implemented that allow powerful data queries on large pools of patient data with relatively low cost and without information and measurement bias. In the field of prosthodontic research, as for other research domains, a university-based dataset can facilitate this process. To this aim, a participatory action research method that links researchers and clinicians synergistically to evaluate and change practices can be appropriate.[2,3] This study briefly describes the approach of creating an evidence-based patient record in the field of removable prosthodontics. Ultimately, this record could be used to provide the basic elements of a prosthodontic database.

[a]*Postgraduate Student, Oral Health and Rehabilitation Research Unit, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Canada.*
[b]*Professor, Oral Health and Rehabilitation Research Unit, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Canada.*
[c]*Associate Professor, Oral Health and Rehabilitation Research Unit, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Canada.*
[a]*Assistant Professor, Oral Health and Rehabilitation Research Unit, Faculté de Médecine Dentaire, Université de Montréal, Montréal, Canada.*

Correspondence to: *Dr Elham Emami, Oral Health and Rehabilitation Research Unit, Faculté de Médecine Dentaire, Université de Montréal, CP 6128, succursale centre-ville, Montréal (Québec), Canada H3C 3J7. Fax: 514-343-2233.*

Materials and Methods

The study was approved by the Ethics Committee of the Université de Montréal, and informed written consent was obtained from each participant. A participatory action research design and the purposive sampling technique were used to select study participants (Table 1).[2–4]

Data were collected during the different phases of the action research cycle (Fig 1). In the first phase, "problem identification," six focus-group discussions and 13 individual interviews were conducted to develop the criteria for designing the new patient record.

In the second study phase, "gathering and interpreting data," a systematic review was conducted to identify the main reported outcomes in the field of removable prosthodontics.

In the next phases, "action planning/acting on the evidence," the new prosthodontic record was designed based on the results of the previous phases. Finally, in the last phases, "action evaluation/interpretation," the completeness and appropriateness of the new prosthodontic record was assessed and necessary modifications were carried out.

The analysis included debriefing, transcription, and thematic analysis.[5] The interviews and focus groups were all audio-recorded, transcribed verbatim, and coded using computer qualitative software (QDA Miner version 3.2.3, Provalis Research).

Results

The thematic analysis of the collected data yielded several key concepts that are summarized below.

Table 1 The Demographic and Academic Characteristics of Study Participants (n = 14)

Participants	Total
Sex	
Male	9
Female	5
Academic status	
Full-time professor in removable prosthodontics	5
Part-time clinician in removable prosthodontics	9
Age	
30 to 40 y	4
41 to 50 y	6
≥ 51 y	4
Teaching experience	
< 10 y	1
10 to 20 y	4
21 to 30 y	6
> 30 y	3

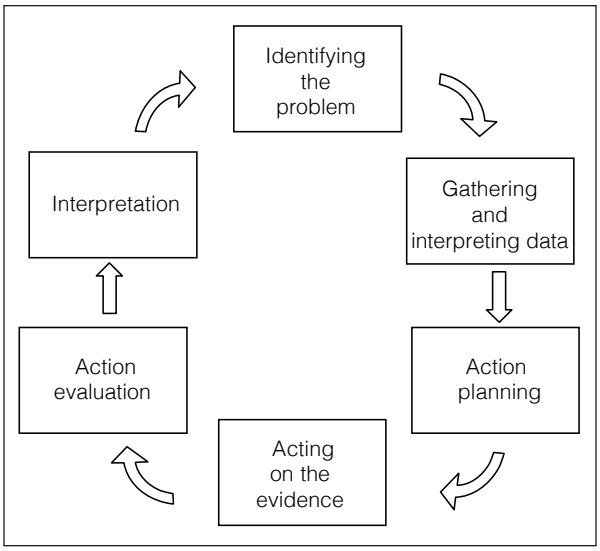


Fig 1 Action research cycle model (adapted from Susman[7]).

Table 2 The Content of the Newly Designed Evidence-Based Prosthodontic Record and Related Questionnaires

Prosthodontic record	
Part 1:	
Assessment of potential risk factors of prosthodontic outcomes	Sociodemographic characteristics, medical and dental history, lifestyle habits, dental service use, oral hygiene habits, dental anxiety, and psychologic characteristics
Part 2:	
Oral clinical examinations and assessment of disease-oriented outcomes	Evaluation of current denture, soft and hard tissues, caries, periodontal diseases, denture stomatitis, and alveolar bone resorption
Part 3:	
Assessment of patient-oriented outcomes	Oral health–related quality of life, patient satisfaction, and dental visit satisfaction

Enthusiasm to Change

This theme was evident when the professors and clinical instructors demonstrated their willingness to collaborate in the process.

Empowerment in Practice, Education, and Research

Three types of weaknesses in the current prosthodontic record were identified. *(1)* Clinical weaknesses: for most interviewees, the actual clinical form did not allow for patient follow-up or for conducting clinical audits. In addition, the participants mentioned that the clinical form was totally theoretical in format. *(2)* Educational weaknesses: most of the professors expressed that the information gained by the actual patient record did not allow the students to develop clinical decision-making skills. *(3)* Research weaknesses: the clinical researchers stated that the existing record was solely clinical.

Barriers to Change

Combining research and clinical training was found to be difficult in the undergraduate clinic because of several barriers, such as deficient infrastructure, lack of time in the clinical sessions, and lack of research training for clinical instructors.

Expanding Knowledge

Based on an extensive systematic review, the important outcomes of interest in removable prosthodontic research and their data collection instruments were selected and the new research-based prosthodontic record was developed in the action planning phase and evaluated by the research team in the action evaluation and interpretation phases (Table 2, Appendices I to IV).

Appendix I: Part of Questionnaire no. 1

H.7. How many pairs of your posterior (back) natural teeth in the right side get in touch during chewing?

0 1 2 3 4 5

H.8. How many pairs of your posterior (back) natural teeth in the left side get in touch during chewing?

0 1 2 3 4 5

Before answering the following questions, please pay attention to these definitions:

Partial denture: a removable prosthesis with artificial teeth that replace some of your teeth in the upper and/or lower jaw.

Complete denture: a removable prosthesis with artificial teeth that replace all of your teeth in the upper and/or lower jaw.

H.9. Do you wear a denture? ☐ Yes (If yes, please go to the next question) ☐ No

H.10. Please choose the best response for the next questions and answer in the table below.

A) Approximately when did you start wearing a denture? B) Which kind?

C) Which jaw? D) Please mention if you were wearing it/them during mastication.

A: Age	B: Type of denture	C: Jaw	D: Wearing during mastication
☐ Between 20–34	☐ Complete denture ☐ Partial denture	☐ Upper ☐ Lower ☐ Both ☐ Non applicable	☐ Yes ☐ No
☐ Between 35–49	☐ Complete denture ☐ Partial denture	☐ Upper ☐ Lower ☐ Both ☐ Non applicable	☐ Yes ☐ No
☐ Between 50–64	☐ Complete denture ☐ Partial denture	☐ Upper ☐ Lower ☐ Both ☐ Non applicable	☐ Yes ☐ No
☐ 65 and older	☐ Complete denture ☐ Partial denture	☐ Upper ☐ Lower ☐ Both ☐ Non applicable	☐ Yes ☐ No

Discussion

An evidence-based patient record has several advantages, such as monitoring dental care, facilitating clinical research, and allowing clinical audit in the university-based setting. Furthermore, it will create a research-training environment for clinicians and dental students. It will also raise awareness about evidence-based practice. Previously, some initiatives have been undertaken to improve the prosthodontic clinical recording system. For example, the American College of Prosthodontists has developed a classification system to provide a framework for the organization of clinical observations.[6] However, in terms of implementation, barriers could be expected, such as students' resistance toward the complexity of the design and lack of knowledge regarding the concept. The authors believe that by providing appropriate support and training these barriers could be resolved.

Appendix II: Part of Complete Removable Prosthesis Questionnaire

TREATMENT PLAN

A: preprosthetic

Conditions requiring preprosthetic surgery

- ☐ Extraction
- ☐ Minor soft tissue surgeries
- ☐ Implant surgery

B: prosthetic

Suggested treatment (Please choose more than one, if several treatments are needed)

☐ New prosthesis ☐ C/C ☐ C/ ☐ /C ☐ Implant-supported prosthesis

☐ Reline ☐ Rebase ☐ Repair

PROGNOSIS

Influencing factors	Favorable	Unfavorable
Anatomical factors	☐	☐
Underlying systematic disease	☐	☐
Orofacial problems (TMD symptoms....)	☐	☐
Psychosocial factors	☐	☐
Prosthesis history	☐	☐

In general the prognosis is	Good	Conditional	Poor
Max	☐	☐	☐
Mand	☐	☐	☐

Conclusion

This study showed that the application of action research methods ensures consideration of the needs, perspectives, and expertise of academia in the design and implementation of an evidence/research-based patient record in the field of removable prosthodontics.

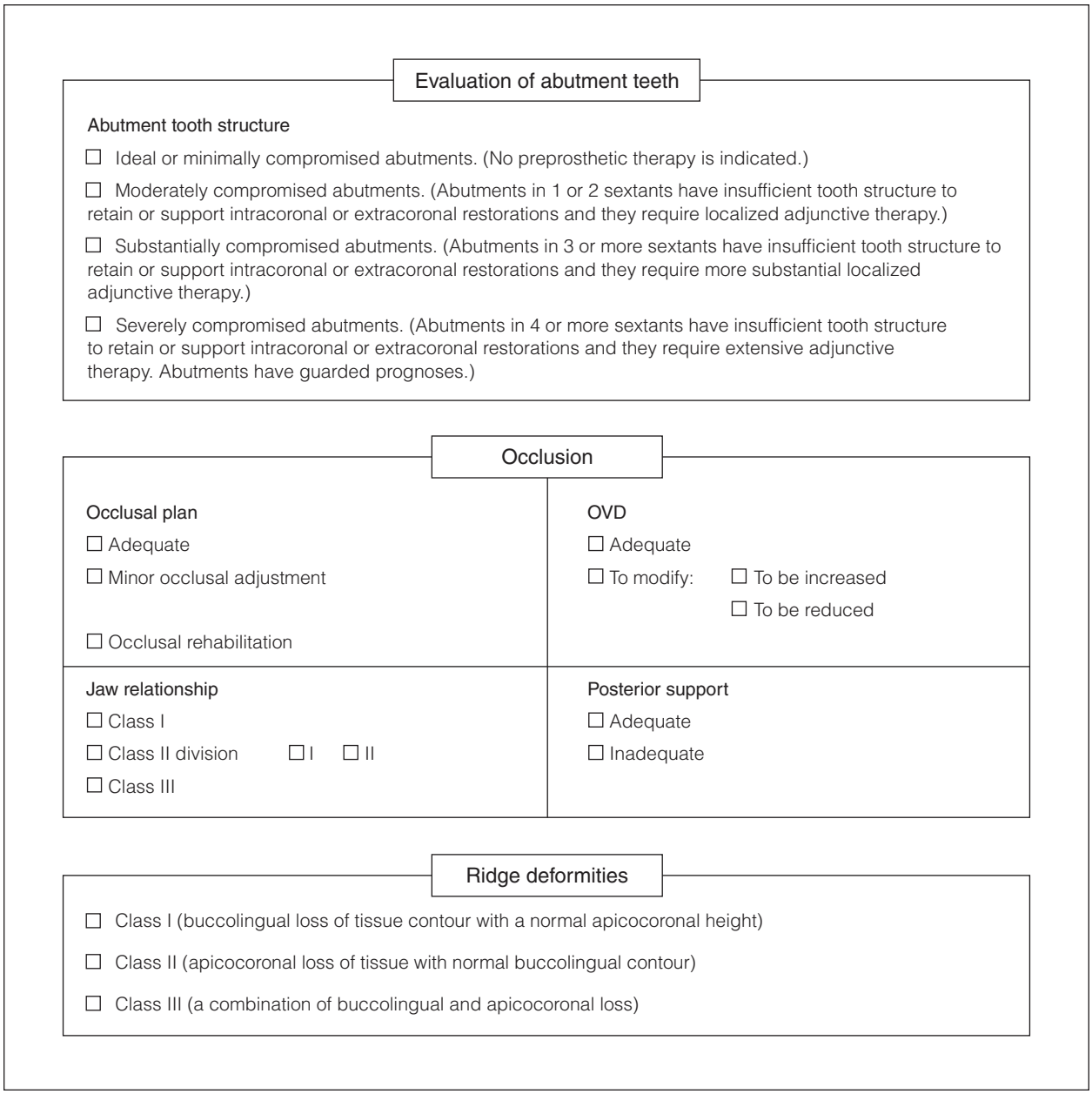
Acknowledgment

The authors reported no conflicts of interest related to this study.

References

1. Stark PC, Kalenderian E, White JM, et al. Consortium for oral health-related informatics: Improving dental research, education, and treatment. J Dent Educ 2010;74:1051–1065.

Appendix III: Part of Partial Removable Prosthesis Questionnaire



Evaluation of abutment teeth

Abutment tooth structure

☐ Ideal or minimally compromised abutments. (No preprosthetic therapy is indicated.)

☐ Moderately compromised abutments. (Abutments in 1 or 2 sextants have insufficient tooth structure to retain or support intracoronal or extracoronal restorations and they require localized adjunctive therapy.)

☐ Substantially compromised abutments. (Abutments in 3 or more sextants have insufficient tooth structure to retain or support intracoronal or extracoronal restorations and they require more substantial localized adjunctive therapy.)

☐ Severely compromised abutments. (Abutments in 4 or more sextants have insufficient tooth structure to retain or support intracoronal or extracoronal restorations and they require extensive adjunctive therapy. Abutments have guarded prognoses.)

Occlusion

Occlusal plan

☐ Adequate

☐ Minor occlusal adjustment

☐ Occlusal rehabilitation

OVD

☐ Adequate

☐ To modify: ☐ To be increased ☐ To be reduced

Jaw relationship

☐ Class I

☐ Class II division ☐ I ☐ II

☐ Class III

Posterior support

☐ Adequate

☐ Inadequate

Ridge deformities

☐ Class I (buccolingual loss of tissue contour with a normal apicocoronal height)

☐ Class II (apicocoronal loss of tissue with normal buccolingual contour)

☐ Class III (a combination of buccolingual and apicocoronal loss)

2. Koch T, Kralik D. The participatory action research process in practice. In: Koch T, Kralik D (eds). Participatory Action Research in Health Care. Chichester: Wiley-Blackwell, 2006:41–64.
3. Elliot J. Action research in policy contexts. In: Elliot J (ed). Action Research for Educational Change. Milton Keynes: Open University Press, 1991:43–69.
4. Patton MQ. Designing qulitative studies. In: Patton MQ (ed). Qualitative Research and Evaluation Methods, ed 3. Thousand Oaks, CA: Sage, 2002:230–246.
5. Boyatzis RE. Developing themes and codes. In: Boyatzis RE (ed). Transforming Qualitative Information: Thematic Analysis and Code Development. Thousand Oaks, CA: Sage, 1998:29–54.
6. McGarry TJ, Nimmo A, Skiba JF, et al. Classification system for partial edentulism. J Prosthodont 2002;11:181–193.
7. Susman GI. Action Research: A Sociotechnical Systems Perspective. Newbury Park: Sage, 1983.

Appendix IV: Part of Outcomes Questionnaire

On a scale of 1 to 5, please circle the number that best fits your answer (please circle one).	Never	Rarely	Sometimes	Often	Always
B.15. Do you experience difficulty cleaning your denture?	1	2	3	4	5
B.16. Do you experience any bad mouth odor with your dentures?	1	2	3	4	5
B.17. Do you experience any mouth dryness?	1	2	3	4	5
B.18. Do you experience problems with oral continence (drooling)?	1	2	3	4	5

Section C

C.1. How satisfied do you think you will be with a new conventional prosthesis?

0 ——————————————————————— 100

0 = not satisfied at all 100 = completely satisfied

Section D

D.1. After talking with the dentist/student, I know what the condition of my mouth is.

☐ Strongly disagree ☐ Disagree ☐ Uncertain ☐ Agree ☐ Strongly agree

D.2. After talking with the dentist/student, I have a good idea of what changes to expect in my dental health in the next few months.

☐ Strongly disagree ☐ Disagree ☐ Uncertain ☐ Agree ☐ Strongly agree

D.3. The dentist/student told me all I wanted to know about my dental problem(s).

☐ Strongly disagree ☐ Disagree ☐ Uncertain ☐ Agree ☐ Strongly agree

D.4. I really felt understood by my dentist/student.

☐ Strongly disagree ☐ Disagree ☐ Uncertain ☐ Agree ☐ Strongly agree

D.5. I felt that this dentist/student really knew how upset I was about the possibility of pain.

☐ Strongly disagree ☐ Disagree ☐ Uncertain ☐ Agree ☐ Strongly agree

Literature Abstract

Oral bisphosphonate use increases the risk for inflammatory jaw disease: A cohort study

Bisphosphonates (BPs) have been widely used as anti-resorptive agents due to their anti-osteoclatic action. The purpose of this cohort study was to determine whether Danish patients who were treated with BPs and other drugs for the preventive treatment of osteoporosis have an elevated risk for inflammatory jaw-related events, such as osteomyelitis, osteitis, periostitis, or sequestrum, compared with a random sample of the Danish population (the nonexposed group). Results showed that the study sample consisted of 103,562 index subjects and 310,683 control subjects. After adjusting for other factors, including diabetes and chemotherapy, two BPs, alendronate (HR = 3.15, 95% confidence interval: 1.44–6.87) and etidronate (HR = 2.23, 95% confidence interval: 1.15–4.31), were correlated with an elevated risk for inflammatory jaw events. There was no dose-response relationship between oral BPs and inflammatory jaw events. The authors concluded that the oral BPs alendronate and etidronate were correlated with an elevated risk for inflammatory jaw events.

Vestergaard P, Schwartz K, Rejnmark L, Mosekilde L, Pinholt EM. *J Oral Maxillofac Surg* 2012;70:821–829. **Reprints:** Dr. E Pinholt, Department of Oral and Maxillofacial Surgery, Institute of Odontology, Faculty of Health Sciences, University of Copenhagen, Nørre Allé 20, 2200 Denmark. **Email:** emp@sund.ku.dk—*Arthur S. Sham, Hong Kong*