



Dental Patient-Reported Outcomes Update 2022

DOI:

[10.1016/j.jebdp.2022.101802](https://doi.org/10.1016/j.jebdp.2022.101802)

Document Version

Accepted author manuscript

[Link to publication record in Manchester Research Explorer](#)

Citation for published version (APA):

Hua, F. (2022). Dental Patient-Reported Outcomes Update 2022. *Journal of Evidence-Based Dental Practice*. Advance online publication. <https://doi.org/10.1016/j.jebdp.2022.101802>

Published in:

Journal of Evidence-Based Dental Practice

Citing this paper

Please note that where the full-text provided on Manchester Research Explorer is the Author Accepted Manuscript or Proof version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version.

General rights

Copyright and moral rights for the publications made accessible in the Research Explorer are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Takedown policy

If you believe that this document breaches copyright please refer to the University of Manchester's Takedown Procedures [<http://man.ac.uk/04Y6Bo>] or contact uml.scholarlycommunications@manchester.ac.uk providing relevant details, so we can investigate your claim.



Dental Patient-Reported Outcomes Update 2022

Fang Hua, BDS, MSc, PhD ^{a,b,c,d}

^a. Hubei-MOST KLOS & KLOBM, School and Hospital of Stomatology, Wuhan University, Wuhan, China.

^b. Center for Evidence-Based Stomatology, School and Hospital of Stomatology, Wuhan University, Wuhan, China.

^c. Center for Orthodontics and Pediatric Dentistry at Optics Valley Branch, School and Hospital of Stomatology, Wuhan University, Wuhan, China

^d. Division of Dentistry, School of Medical Sciences, Faculty of Biology, Medicine and Health, The University of Manchester, Manchester, UK.

<https://doi.org/10.1016/j.jebdp.2022.101802>

CORRESPONDING AUTHOR:

Fang Hua, School & Hospital of Stomatology, Wuhan University, Luoyu Road 237, Wuhan 430079, China. E-mail: huafang@whu.edu.cn

This article is part of the special issue “Dental Patient Reported Outcomes Update 2022.”

KEYWORDS:

Dental patient-reported outcome, dental patient-reported outcome measure, oral health-related quality of life, evidence-based dentistry

SOURCE OF FUNDING:

F.H. is supported by the National Natural Science Foundation of China (No. 81901044), the Chinese Stomatological Association COS Basic Research Fund (No. COS-B2021-08), and the Wuhan University School of Medicine Teaching Research Project (No. 2021074).

ACKNOWLEDGEMENTS

The author would like to thank Prof. Mike T. John (University of Minnesota) for his kind guidance and support throughout the preparation of this Special Issue.

ABSTRACT

Much progress has been made this year in patient-reported outcomes related research. A number of important articles were published, shedding light on relevant methodological issues as well as future directions. In order to further promote the wide use of dental patient-reported outcomes (dPROs) and dental patient-reported outcome measures (dPROMs) in dental research and dental practice, and to provide novel insights into relevant measurement and analytical methods, the Journal of Evidence-Based Dental Practice has put together this special issue, the second of a series entitled Dental Patient-Reported Outcomes Update.

To put Special Issue articles into a broader perspective, this review will provide a concise summary of key, relevant PRO and dPRO articles published during the year of 2022. A brief introduction of those manuscripts collected in this Special Issue follows. Six main domains are covered in this Special Issue: (i) the availability and applicability of dPROs and dPROMs, (ii) the current usage of dPROs and dPROMs in published research, (iii) methodological considerations in dPRO-related research, (iv) the landscape and trends of dPRO-related research, (v) the significance and relevance of dPRO usage, and (vi) dPROs and value-based oral health care.

INTRODUCTION

Much progress has been made this year in patient-reported outcomes (PROs) related research. A series of important articles were published, shedding light on relevant methodological issues as well as future directions. In order to further promote the wide use of dental patient-reported outcomes (dPROs) and dental patient-reported outcome measures (dPROMs) in dental research and dental practice,¹ and to provide novel insights into relevant measurement and analytical methods, the *Journal of Evidence-Based Dental Practice* has put together this special issue, the second of a series entitled Dental Patient-Reported Outcomes Update.² To put Special Issue articles into a broader perspective, this review will provide a concise summary of key, relevant PRO and dPRO articles published during this year. A brief introduction of those manuscripts collected in this Special Issue follows.

SELECTED ARTICLES PUBLISHED IN 2022

Selected Articles on PROs

In January 2022, an author team led by Calvert³ published an article in *Nature Medicine*, which introduced the benefits of using PROs in early-phase clinical trials, as well as those methodological considerations to be addressed when developing a PRO assessment strategy for such studies. Four months later, in a special communication article in *JAMA*, Calvert and colleagues⁴ reported the methodology and final content of the PRO Ethics Guidelines -- an international, consensus-based, 14-item ethical guidelines that they developed for including PROs in clinical research.

Also published in *JAMA*, a “Guides to Statistics and Methods” article by Weinfurt and Reeve⁵ discussed the what, why, and how of using patient-reported outcome measures (PROMs) in clinical research. Khan and Butler⁶ illustrated how PROs and the corresponding minimally clinically important differences (MCIDs) could be used to interpret changes in health status and provide clinically intuitive understanding of treatment benefits. In addition, Basch et al.⁷ reported the findings of a cluster randomized trial, which showed that weekly electronic PRO (ePRO) surveys for symptom monitoring was associated with significant improvements in physical function, symptom control and health-related quality of life (HRQoL), presenting new evidence that support the use of ePROs in cancer care.⁸

Previously, although the problem of “research waste” had been raised and studied in various aspects of biomedical research,⁹⁻¹¹ especially the adherence to reporting guidelines,^{12, 13} its specific consequences for HRQoL/PRO research remained underexplored. Therefore, in October 2022, *Quality of Life Research* published a special issue entitled “Reducing Research Waste in (Health-Related) Quality of Life Research”,¹⁴ which collected 8 articles covering not only research reporting, but also

research design and conduct, regulation and management, as well as the usability of results. In addition to identifying avoidable waste and their sources in HRQoL/PRO research, these articles also provided recommendations and potential solutions for reducing research waste.

Selected Articles on dPROs

Oral Health Impact Profile (OHIP), one of the most commonly used dPROM, was originally designed to cover seven attributes. However, there is increasing evidence that a set of four-dimensions, namely Oral Function, Orofacial Pain, Orofacial Appearance, and Psychosocial Impact, is a clinically and psychometrically better structure for OHIP and oral health-related quality of life (OHRQoL).¹⁵ Therefore, John and colleagues¹⁶ looked into the measurement of overall OHRQoL and its four dimensions with different versions of OHIP, and then gave detailed recommendations on the ideal and practical approaches to OHRQoL characterization. These recommendations were later validated.¹⁷

The Orofacial Esthetic Scale (OES) is a classic unidimensional instrument, developed to assess Orofacial Appearance in prosthodontic patients.¹⁸ Although the original OES has only 8 items, yet a one-item OES would be beneficial in terms of participants' compliance, burden of research, and applicability in large samples. In light of this, Andela et al.¹⁹ developed OES-1 based on OES item 8, and showed that it can adequately capture the construct of Orofacial Appearance and become an effective tool for clinical trials and dental care. Similarly, Pattanaik et al.²⁰ conducted a study to determine the impact of collapsing the response format of OES on its measurement, and found evidence that supports the use of a 5-point numerical rating scale, instead of the original 11-point format.

In addition, several review articles explored the use of dPROs in various aspects of dentistry. McGrath and colleagues²¹ performed a scoping review to assess how and what dPROs were employed in studies on the relationship between oral health and successful aging. Wong et al.²² discussed the importance, rationale, and current status of using dPROMs in the assessment of endodontic treatment. Leles et al.²³ introduced the concepts of dPROs and dPROMs, as well as the benefits of using them in the context of evidence-based prosthodontics.

ARTICLES INCLUDED IN THIS SPECIAL ISSUE

Availability and Applicability of dPROs and dPROMs

This Special Issue starts with two articles regarding the availability and applicability of dPROs and dPROMs. In the first article, Ingleshwar and John²⁴ conducted a

systematic review to identify all cross-cultural adaptations of OHIP versions, and thereby determine whether the four-dimensional approach to oral health impact characterization can be performed on a global scale. From databases and other sources, the authors identified 82 eligible studies containing 90 individual OHIP language versions. These language versions represented cross-cultural adaptations for 45 distinct languages. Among the top-20 languages with the most native speakers, a corresponding version of OHIP exist for 16 languages, and four-dimensional psychometric evidence was available for 13 languages. Based on these findings, the authors concluded that four-dimensional oral health impact characterization is a globally available approach, and gave recommendations on future research efforts which could further increase the global reach of four-dimensional assessment.

Previous research has shown that the burden of oral diseases is particularly high for disadvantaged and poor population groups, including those in developing and developed countries.²⁵ In the second article, Lawal and Omara ²⁶ discussed the usefulness and applicability of dPROs in low resource settings (LRS), based on a summary of the characteristics of LRS, current oral health status in LRS, and the basics of oral health assessment methods and dPROs. Thereafter, the authors elaborated on the particular advantages of using dPROs and OHRQoL in LRS, which could be categorized into seven main aspects namely research, oral health assessment, treatment delivery, treatment evaluation, public health programs, and population health surveillance.

Current Usage of dPROs and dPROMs in Published Research

The next three articles in this Special Issue, each focused on a specific area of dentistry, present the current usage of dPROs in published research. Tao and colleagues ²⁷ carried out a methodological study to identify and summarize the use and characteristics of dPROs and dPROMs among randomized controlled trials (RCTs) in the field of orthodontics. A total of 315 RCTs were included in this study, among which less than one-fourth used dPROs (n=8) and dPROMs (n=34). OHRQoL and pain measured with visual analogue scale was the most frequently used dPRO and dPROM, respectively. OHIP-14 was the most frequently used generic multiple-item dPROM for OHRQoL assessment, yet it was used in only 5 of the included trials. Based on these findings, the author team concludes that there is substantial heterogeneity in terms of the dPROMs used in orthodontic trials; efforts are required from stakeholders to promote wide and standardized use of dPROs in orthodontic research.

In another methodological study, Reuter-Selbach et al. ²⁸ investigated the characteristics of dPRO reporting among RCTs regarding root coverage procedures. The author team identified 135 eligible trials, and found that about three-fifths of them

reported dPROs. However, OHRQoL was not among the frequently reported dPROs in these trials, which mainly included pain or discomfort, dentin hypersensitivity and satisfaction with treatment. In addition, it was found that more recently published trials, trials from developed countries, trials that were registered, and those with a parallel design seemed to report more dPROs. These findings are of practical value for further development and uptake of dPROs and dPROMs in periodontal research.

Obstructive sleep apnea (OSA) is one type of sleep-related breathing disorders that has detrimental effects on the health of both adults and children.²⁹⁻³¹ Oral appliance (OA) therapy, often provided by orthodontic professionals, is one of the most common treatment approaches for these patients.³² In order to summarize dPROs related to OA therapy for children and adults with OSA, Fagundes and colleagues³³ carried out a scoping review of OA-related primary studies that had assessed patients' perceptions regarding QoL, side effects, satisfaction, experience with treatment, and occlusal / dental changes. Based on an analysis of 45 eligible studies, the author team found that dPROs were mostly used as secondary outcomes and they were seldom adequately discussed or presented in study reports. The authors also pointed out several research gaps, such as dPRO-based data for pediatric patients and those that discontinued OA therapy.

Methodological Considerations in dPRO-related Research

Advances in methodology are crucial in medical and dental research as they build new foundations for future development. In this Special Issue, three articles provide novel insights into the methodology of dPRO-related research. Schierz and colleagues³⁴ conducted a study based on data from an RCT on shortened dental arches, to demonstrate how to identify OHRQoL treatment response patterns which is important for clinical decision-making. Using group-based trajectory modeling, a promising statistical technique that is not common in dentistry, the author team successfully identified the “responders” and “non-responders” subgroups, and analyzed their differences in OHRQoL-related characteristics.

The other two articles in this category focused on the methodology in two specific areas. Chanthavisouk et al.³⁵ identified 19 distinct groups of dental hygiene and dental therapy patients through an allied dental expert panel, and found that only 5 of these patient groups had corresponding research in the literature. This study provides important information on the scopes of dental hygiene and dental therapy practices, which is crucial for relevant stakeholders to develop appropriate PICO questions, and to understand dPROs and dPROMs when utilizing the four-dimensions of OHRQoL. The lack of evidence identified for specific patient populations highlights the research gap in this area that requires more evidence-based investigations.

People with intellectual disability (ID) tend to have poorer oral health and poorer access to oral health care.³⁶ However, there has been a lack of relevant data, mainly due to challenges in data collection from this population. In light of these, Nair et al.³⁷ introduced the methods and rationale for operationalizing health outcome measurement in persons with ID, including basic concepts in relevant research and practice, the importance and limitations of using dPROMs in this area, as well as scenarios in which proxy-reported outcome (ProxRO), observer reported outcome (ObsRO) and clinician reported outcome (ClinRO) measures can help improve data collection.

The Landscape and Trends of dPRO-related Research

OHRQoL is the most important dPRO and has been widely used in dental research and dental practice.^{38,39} In order to explore the characteristics and trends of OHRQoL-related research, Yu and colleagues⁴⁰ conducted a bibliometric mapping study using information from the Web of Science Core Collection database and relevant scientometric tools including VOSviewer, Bibiloshiny, Scimago Graphica and Keyword Plus. Based on 3324 OHRQoL-related articles, the author team identified highly cited articles, prolific authors, productive institutions, productive countries, collaboration networks, as well as the list and networks of high-frequency keywords. These data are very helpful for understanding the overall landscape and development trends of OHRQoL-related research, and can provide practical guidance to relevant researchers as well as policy-makers in their study design and decision-making.

The Significance and Relevance of dPRO Usage

The next three articles are about the significance and relevance of dPROs for various aspects of oral health. Orofacial cleft is a congenital abnormality that affects not only patients' appearances, but also their orofacial function and psychosocial well-being. However, orofacial cleft related interventions have been assessed with traditional outcomes such as complication rate and jaw relationship. In a narrative article, Ongkosuwito and Kuijpers⁴¹ introduced the significance of using dPROs and dPROMs in the context of current research progress and shared-decision making, and then discussed relevant challenges and barriers that need to be addressed in future research.

Advancement in dental materials has long been one of the main driving forces behind development of dental practice. Before being launched into a market, novel dental materials products need to meet the requirements of relevant regulation agencies, but these requirements and standards are usually based on laboratory- or dentist-centered

measurement. In light of this, Tsoi and Ding ⁴² demonstrated the value of clinical assessment and patients reported information for dental materials evaluation, and reviewed the current situation and recent progresses in research and regulations on using dPROs and dPROMs in this important area.

In the third article, Karimbux and colleagues ⁴³ discussed issues related to the measurement of patient experience of oral health care. The authors started by introducing the definition of patient experience and the importance of its measurement, and then elaborated on three main challenges in measuring patient experience in the context of oral health care, as well as the current usage of dPROs in this field. Based on these discussions, the author team gave recommendations on future directions, including the qualitative research regarding stakeholders' needs and perspectives, development and validation of rigorous survey tools, as well as broad implementation of developed tools.

dPROs and Value-Based Oral Health Care

Value-based oral health care (VBOHC) is an important concept that is closely related to dPROs and dPROMs.^{44, 45} In the last article of this Special Issue, Omara and colleagues ⁴⁶ reported a case study from the Medical University of Vienna, which summarized the lessons they learnt in VBOHC implementation, including those in institutional dedication and commitment, assessment of existing infrastructure, stakeholders' engagement, digital solutions, resource allocation, dPRO collection during follow-up visits, as well as continuous monitoring and evaluation of the process. Based on these, the author team pointed out the opportunities and future directions in VBOHC, including the need for more dPRO assessments in the four-dimensional approach.

CONCLUSIONS

In summary, this Special Issue presents clinicians, researchers, educators and policymakers in dentistry with novel insights into dPRO-related knowledge and methodology. Six main domains are covered, namely the availability and applicability of dPROs and dPROMs, current usage of dPROs and dPROMs in published research, methodological considerations in dPRO-related research, the landscape and trends of dPRO-related research, the significance and relevance of dPRO usage, as well as dPROs and VBOHC.

I would like to thank the contributors and reviewers for their valuable support to this Special Issue, which hopefully can further promote the use and development of dPROs in dental research and dental practice.

REFERENCES

1. John MT. Health outcomes reported by dental patients. *J Evid Based Dent Pract.* 2018;18:332-335.
2. Hua F. Dental Patient-Reported Outcomes Update 2021. *J Evid Based Dent Pract.* 2022;22:101663.
3. Retzer A, Aiyegbusi OL, Rowe A, et al. The value of patient-reported outcomes in early-phase clinical trials. *Nat Med.* 2022;28:18-20.
4. Cruz Rivera S, Aiyegbusi OL, Ives J, et al. Ethical Considerations for the Inclusion of Patient-Reported Outcomes in Clinical Research: The PRO Ethics Guidelines. *JAMA.* 2022;327:1910-1919.
5. Weinfurt KP, Reeve BB. Patient-Reported Outcome Measures in Clinical Research. *JAMA.* 2022;328:472-473.
6. Khan MS, Butler J. Stability of Changes in Health Status: Next Step in Comprehensively Assessing Patient-Reported Outcomes. *JAMA.* 2022;328:923-924.
7. Basch E, Schrag D, Henson S, et al. Effect of Electronic Symptom Monitoring on Patient-Reported Outcomes Among Patients With Metastatic Cancer: A Randomized Clinical Trial. *JAMA.* 2022;327:2413-2422.
8. Velazquez AI, Florez N. Electronic Monitoring of Patient-Reported Outcomes-Ready for Prime Time? *JAMA Oncol.* 2022;8:1099-1100.
9. Chalmers I, Glasziou P. Avoidable waste in the production and reporting of research evidence. *Lancet.* 2009;374:86-89.
10. Hua F. Increasing the Value of Orthodontic Research Through the Use of Dental Patient-Reported Outcomes. *J Evid Based Dent Pract.* 2019;19:99-105.
11. Almaqrami BS, Hua F, Liu Y, He H. Research waste-related editorial policies of leading dental journals: Situation 2018. *Oral Dis.* 2020;26:696-706.
12. Hua F, Walsh T, Glenny AM, Worthington H. Surveys on Reporting Guideline Usage in Dental Journals. *J Dent Res.* 2016;95:1207-1213.
13. Qin D, Hua F, He H, Liang S, Worthington H, Walsh T. Quality of Split-Mouth Trials in Dentistry: 1998, 2008, and 2018. *J Dent Res.* 2020;99:1453-1460.
14. Rutherford C, Boehnke JR. Introduction to the special section "Reducing research waste in (health-related) quality of life research". *Qual Life Res.* 2022;31:2881-2887.
15. John MT, Renner-Sitar K, Baba K, et al. Patterns of impaired oral health-related quality of life dimensions. *J Oral Rehabil.* 2016;43:519-527.
16. John MT, Omara M, Su N, et al. Recommendations for Use and Scoring of Oral Health Impact Profile Versions. *J Evid Based Dent Pract.* 2022;22:101619.
17. John MT. Standardization of Dental Patient-Reported Outcomes Measurement Using OHIP-5 - Validation of "Recommendations for Use and Scoring of Oral Health Impact Profile Versions". *J Evid Based Dent Pract.* 2022;22:101645.
18. Larsson P, John MT, Nilner K, Bondemark L, List T. Development of an Orofacial Esthetic Scale in prosthodontic patients. *Int J Prosthodont.* 2010;23:249-256.
19. Bela Andela S, Lamprecht R, John MT, Pattanaik S, Reissmann DR. Development of a one-item version of the Orofacial Esthetic Scale. *Clin Oral Investig.*

- 2022;26:713-718.
20. Pattanaik S, John MT, Chung S, Keller S. Comparison of two rating scales with the orofacial esthetic scale and practical recommendations for its application. *Health Qual Life Outcomes*. 2022;20:131.
 21. Mc GC, Suen RP, Mc KG, Moore C, Wong MC. Oral Health and Successful Ageing - The PROS and dPROS: A Scoping Review. *J Evid Based Dent Pract*. 2022;22:101714.
 22. Wong J, Cheung GSP, Lee AHC, McGrath C, Neelakantan P. PROMs Following Root Canal Treatment and Surgical Endodontic Treatment. *Int Dent J*. 2022:In press.
 23. Leles CR, Silva JR, Curado TFF, Schimmel M, McKenna G. The Potential Role of Dental Patient-Reported Outcomes (dPROs) in Evidence-Based Prosthodontics and Clinical Care: A Narrative Review. *Patient Relat Outcome Meas*. 2022;13:131-143.
 24. Ingleshwar A, John MT. Cross-cultural adaptations of the oral health impact profile – An assessment of global availability of four-dimensional oral health impact characterization. *J Evid Based Dent Pract*. 2022:In press.
 25. Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bull World Health Organ*. 2005;83:661-669.
 26. Lawal FB, Omara M. Applicability of dental patient reported outcomes in low resource settings - a call to bridge the gap in clinical and community dentistry. *J Evid Based Dent Pract*. 2022:In press.
 27. Tao Z, Zhao T, Ngan P, Qin D, Hua F, He H. The use of dental patient-reported outcomes among randomized controlled trials in orthodontics: A methodological study. *J Evid Based Dent Pract*. 2022:In press.
 28. Reuters-Selbach MJ, Su N, Faggion Jr CM. Assessment of the frequency of reporting dental patient-reported outcomes (dPROs) in a sample of randomized controlled trials on root coverage procedures. *J Evid Based Dent Pract*. 2022:In press.
 29. Fagundes NCF, Flores-Mir C. Pediatric obstructive sleep apnea-Dental professionals can play a crucial role. *Pediatr Pulmonol*. 2022;57:1860-1868.
 30. Pauletto P, Reus JC, Bolan M, et al. Association between obstructive sleep apnea and health-related quality of life in untreated adults: a systematic review. *Sleep Breath*. 2021;25:1773-1789.
 31. Lin L, Zhao T, Qin D, Hua F, He H. The impact of mouth breathing on dentofacial development: A concise review. *Front Public Health*. 2022;10:929165.
 32. Al-Jewair TS. High-Quality Randomized Controlled Trials are Needed to Confirm the Effectiveness of Oral Appliances in the Management of Obstructive Sleep Apnea Syndrome. *J Evid Based Dent Pract*. 2016;16:110-112.
 33. Fagundes NCF, Minervini G, Alonso BF, et al. Patient-reported outcomes while managing obstructive sleep apnea with oral appliances: a scoping review. *J Evid Based Dent Pract*. 2022:In press.
 34. Schierz O, Lee CH, John MT, et al. How to identify subgroups in longitudinal clinical data: Treatment response patterns in patients with a shortened dental arch. *J Evid Based Dent Pract*. 2022:In press.

35. Chanthavisouk P, Arnett M, Seyffer D, Paulson DR. Existing evidence for dental hygiene and dental therapy interventions: A determination of distinct patient populations. *J Evid Based Dent Pract.* 2022:In press.
36. Wilson N, Lin Z, Villarosa A, George A. Oral health status and reported oral health problems in people with intellectual disability: A literature review. *J Intellect Dev Disabil.* 2019;44:292-304.
37. Nair R, Pattamatta M, Listl S. Operationalizing oral health outcome measures to improve the oral health of persons with intellectual disabilities. *J Evid Based Dent Pract.* 2022:In press.
38. Mittal H, John MT, Sekulic S, Theis-Mahon N, Renner-Sitar K. Patient-Reported Outcome Measures for Adult Dental Patients: A Systematic Review. *J Evid Based Dent Pract.* 2019;19:53-70.
39. Shayestehpour S, Sharma K, Mosor E, et al. Patient-Reported Outcome Measures for Pediatric Dental Patients: A Methodological Review and Mapping Exercise. *J Evid Based Dent Pract.* 2022;22:101661.
40. Yu X, Chen Y, Li Y, Hong J, Hua F. A bibliometric mapping study of the literature on oral health-related quality of life. *J Evid Based Dent Pract.* 2022:In press.
41. Ongkosuwito EM, Kuijpers MAR. How PROs can contribute to what matters most to patients with orofacial clefts. *J Evid Based Dent Pract.* 2022:In press.
42. Tsoi JK, Ding H. A narrative review on the overlooked aspects of dPROs in connection with dental materials. *J Evid Based Dent Pract.* 2022:In press.
43. Karimbux N, John MT, Stern A, et al. Measuring patient experience of oral health care: A call to action. *J Evid Based Dent Pract.* 2022:In press.
44. Listl S. Value-Based Oral Health Care: Moving Forward With Dental Patient-Reported Outcomes. *J Evid Based Dent Pract.* 2019;19:255-259.
45. Jivraj A, Barrow J, Listl S. Value-Based Oral Health Care: Implementation Lessons from Four Case Studies. *J Evid Based Dent Pract.* 2022;22:101662.
46. Omara M, Stamm T, Bekes K. Lessons learned from the first steps of implementing value-based oral healthcare: A case study from the Medical University of Vienna. *J Evid Based Dent Pract.* 2022:In press.