VALUE-BASED ORAL HEALTH CARE: MOVING FORWARD WITH DENTAL PATIENT-REPORTED OUTCOMES

STEFAN LISTL, Dr med dent, Dr rer pola,b

aRadboud University Medical Center, Radboud Institute for Health Sciences, Department of Dentistry - Quality and Safety of Oral Healthcare, Nijmegen, the Netherlands
bSection for Translational Health Economics, Department of Conservative Dentistry, Heidelberg University Hospital, Heidelberg, Germany

ABSTRACT

Value-based oral health care is about improving people’s oral health outcomes divided by the costs involved. This article addresses five questions (the “5 Ws”) pertaining to the measurement of oral health outcomes: why oral health outcomes should be measured, what should be measured, by whom, when, and where. Therefore, dental patient-reported outcome measures offer great potential for driving improvements in oral health care. For illustration, a tentative set of seven key relevant items is presented, which comprises the four dimensions of oral health–related quality of life and the three dental conditions with the highest burden of disease. Through promoting the ample use of oral health outcome measures, it is hoped that this article can contribute to expedite value-based oral health care.

WHAT IS VALUE-BASED ORAL HEALTH CARE?

In the context of value-based health care, value has been described as “patient health outcomes achieved per dollar spent.” Along these lines, value-based oral health care (VBOHC) is about improving people’s oral health outcomes divided by the costs involved. Therefore, the objective of achieving good “value for money” intertwines with principles of health economics and quality of care. Value-based health care has been evolving as an approach to address the shortcomings of existing health care setups which have failed to produce good value. Patient choice and competition for patients are emphasized as core principles to encourage continuous improvement in health care. Opportunities for improvement of oral health care through VBOHC could include more transparency about oral health outcomes versus costs in dental practice settings, better integration of dental services in the wider health care system, provider payments that put more emphasis on keeping people in good oral health instead of incentivizing restorative dental treatment, reorienting oral health prevention more toward public health as compared with chairside clinical approaches, and dental service planning to be more responsive to population oral health needs. When navigating toward VBOHC, key relevant questions revolve around how to measure oral health outcomes that matter to people. The costs associated with oral health interventions are arguably more straightforward to determine.

THE 5 W’S OF MEASURING OUTCOMES: WHY, WHAT, BY WHOM, WHEN, AND WHERE

The first question to be asked is why measure oral health outcomes? This is important because the definition of an exact use case (= purpose) helps

CORRESPONDING AUTHOR:
Stefan Listl, Radboud University Medical Center, Department of Dentistry - Quality and Safety of Oral Healthcare, Philips van Leydenlaan 25, 6525 EX Nijmegen, the Netherlands.
E-mail: Stefan.Listl@radboudumc.nl

KEYWORDS
Value-based health care, Patient-reported outcomes, Patient-reported outcome measures, Oral health–related quality of life, Self-reported oral health, Perceived oral health

Conflict of Interest: The author has no actual or potential conflicts of interest.
Source of Funding: Not reported.
narrowing down the subsequent decisions regarding what should be measured by whom, where, and when. Figure 1 schematically illustrates the range of use cases for the measurement of (oral) health outcomes. Thereby, outcomes can be measured either on the level of individual persons or on the population level. Upon further processing by various stakeholders (dentists, physicians, payers, policy makers), they can be useful for (1) dental care improvement, (2) medical-dental integration, (3) value-based payments, (4) public health programming, or (5) monitoring and needs-based planning.

For further illustration, use cases could include, inter alia, the following:

- **Dental care improvement**: reflective learning by dental care teams based on continuous feedback information about patient outcomes before and after treatment. The assessment can, for example, take place in the format of an electronic survey implemented via a mobile application. The feedback information can be provided to dental care teams as infographics in, for example, an electronic dashboard and serve for strategic choices regarding prioritization of interventions with good value for money. For example, a mobile application to retrieve patient-reported information and an electronic dashboard system to provide feedback to dental practitioners were recently developed within the EU-Horizon 2020 project Added Value for Oral Care (ADVOCATE).\(^5\)–\(^7\)

- **Medical-dental integration**: in addition to screening for and monitoring of noncommunicable diseases which share risk factors in common with oral diseases, assessment of patient outcomes in primary care settings provides opportunities for early detection of oral diseases. Reversely, assessment of patient outcomes in dental settings provides opportunities for early detection of noncommunicable diseases (eg, diabetes, cardiovascular diseases). For example, the Dent@Prevent consortium (www.oralsystemicintegration.com) has been prototyping an electronic decision support system for enhancement of medical-dental integration. Thereby, patient outcomes—including self-reports collected via a mobile application—serve as a central information source to facilitate better alignment of care processes between medical and dental care providers.\(^8\)

- **Value-based payments**: health care payers (health maintenance organizations or other types of dental
Insurers can selectively contract with dentists on the basis of patient outcomes achieved and costs incurred during previous years. In addition, contracted dentists can be rewarded relative to the extent to which the dentist’s patient population has been maintained in good oral health. A framework including various methods for oral health care value-based payments has recently been described. 

Public health programs: for example, identify the oral health–related cost-effectiveness of various food labeling approaches on basis of population-representative data;

Monitoring: for example, cross-country comparison of dental care systems performance by intergovernmental organizations;

Needs-based planning: for example, by a country’s department of health. This is intended to ensure delivery of the right care, in the right place, at the right time, by the right number of people, to those most in need. Incorporating people’s oral health needs in dental workforce planning is essential to ensure safe, efficient, and sustainable oral health care.

After having specified the concrete use case, the following questions are what should be measured by whom? When seeking to measure oral health, it is important to acknowledge its multifaceted nature and attributes. Establishing a well-thought-out set of measures that encompasses all relevant oral health outcomes involves several layers of complexity. First, the perspectives of all relevant stakeholder groups need to be incorporated, but the main emphasis should be placed on what matters to patients. In relation to this, the potential of assessing dental patient-reported outcomes (dPROs) by means of dental patient-reported outcome measures (dPROMs) should be highlighted. For several dental disciplines, for example, prosthodontics and orthodontics, the use of dPROs has been advocated for evidence-informed clinical decision-making and reduction of avoidable waste related to research question/outcome selection, aiming for an increased value of dental research and interventions. Second, oral health is multifaceted, but—dependent on context—detailed incorporation of all the various relevant dimensions may be challenging on account of scarcity of time or other resources needed for assessing oral health outcomes. Third, oral health outcome measures should be fit for purpose, yet various use cases may require specific outcome measures and their validity may not have been empirically tested so far.

<table>
<thead>
<tr>
<th>Measurement object</th>
<th>Assessment method</th>
<th>Measurement item</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived oral health</td>
<td>Oral function</td>
<td>Self-reported</td>
</tr>
<tr>
<td>Orofacial pain</td>
<td>“Have you had difficulty chewing any foods because of problems with your teeth, mouth, dentures or jaw?”</td>
<td></td>
</tr>
<tr>
<td>Orofacial appearance</td>
<td>“Have you had painful aching in your mouth?”</td>
<td></td>
</tr>
<tr>
<td>Psychosocial impact</td>
<td>“Have you had difficulty doing your usual jobs because of problems with your teeth, mouth, dentures or jaws?”</td>
<td></td>
</tr>
<tr>
<td>Physical oral health</td>
<td>Tooth loss (a) Self-reported (b) Clinical assessment</td>
<td>(a) Number of lost teeth (self-report) (b) Number of lost teeth (clinical)</td>
</tr>
<tr>
<td>Dental caries</td>
<td>Clinical assessment</td>
<td>Number of teeth with untreated caries (eg, moderate/extensive decay)</td>
</tr>
<tr>
<td>Periodontitis</td>
<td></td>
<td>Number of teeth with periodontal pocketing (for example, stage III &amp; IV)</td>
</tr>
</tbody>
</table>
Broadly, it can be distinguished between two types of oral health outcomes which both matter to patients and partly intertwine: (1) perceived oral health in terms of oral health–related quality of life (OHRQoL) and (2) physical oral health in terms of dental conditions such as dental caries, periodontitis, and tooth loss. The concept of OHRQoL addresses perceived oral health and has four dimensions: oral function, orofacial pain, orofacial appearance, and psychosocial impact.14,15 The validity of OHRQoL instruments such as the 5-item Oral Health Impact Profile has been shown previously,16,17 but even a set consisting of four items may suffice to capture perceived oral health. Note that OHRQoL instruments represent an important type of dPROMs. In terms of physical oral health, a set of three items could be prioritized, corresponding to the three dental conditions with the highest burden of disease: dental caries, periodontitis, and tooth loss.18 While it seems sensible that the assessment of dental caries and periodontitis requires diagnostic information from a health professional, self-reports can provide a valid alternative for clinical assessment of tooth loss.19

For illustration, Table 1 presents a tentative set of seven key relevant items to assess oral health outcomes, including both perceived and physical oral health. This set includes items for the four OHRQoL dimensions and the three dental conditions with the highest burden of disease. Dependent on measurement constraints such as limited time or budget, such a set may also provide a menu from which to select individual items that are deemed feasible and relevant for the respective VBOHC activity. For example, if interview time to assess oral health outcomes within a large multicountry survey such as the Survey of Health, Ageing and Retirement (SHARE) is scarce, information on self-reported tooth loss can already provide valid and relevant information for cross-country comparisons of dental health systems performance.19,22

In the future, cocreative review and updating (together with all relevant stakeholders) of such and similar sets of measures should be targeted at fruition of increasingly harmonized and fit-for-purpose assessments of oral health outcomes.

Finally, to round off with the questions of when and where measurement should take place, it is sensible to consider the following additional criteria:

- the frequency with which measurement items can be expected to change over time: for example, orofacial pain will likely be more fluctuating than tooth loss;
- logistical circumstances: for example, standardized measurement by calibrated study personnel within a specific epidemiological study may require measurement to be carried out in a specific study center;
- data privacy regulations.

WHEN THE RUBBER MEETS THE ROAD

Despite enormous dental expenditures, dental care systems around the world still keep falling short of preventing many people from suffering avoidable consequences of dental diseases.23–25 The necessity for major reforms has recently been urged.26,27 Yet in the spirit of Martin Luther King Jr., “Change does not roll in on the wheels of inevitability, but comes through continuous struggle.” Hence, on the journey of implementing dPROMs for VBOHC, be aware of “bumpy roads” such as limitations in information technology infrastructure or vested interests. It is all the more important to emphasize the measures and data should be used in a safe and responsible manner and the pitfalls of paternalistically misguided normative approaches should be avoided.28,29 It is hoped that the “5 Ws” described previously, emphasizing dPROs as an essential component of health outcome assessment, will be helpful to shift up a gear with VBOHC.

REFERENCES


