ORAL HEALTH RISK STRATIFICATION INSTRUMENT IN THE STATE OF PARANÁ: EVALUATION OF USABILITY BY ORAL HEALTH TEAMS

Mariane Rodrigues de Melo[1], Carolina de Oliveira Azim Schiller[2], Gabriela da Silveira Spisla[3], Kelly Cristina Tavares Nascimento[4], Caren Cristina Muraro[5], Giovana Daniela Pecharki Vianna[6], João Mário Cubas[7] and Solena Ziemer Kusma Fidalski[8].

ABSTRACT

The objective of this research was to evaluate the usability of the Risk Stratification Instrument in Oral Health as part of the validation process of the instrument in the State of Paraná. This is an observational, cross-sectional research, carried out from August to September 2022, with 34 oral health teams in the metropolitan region of the Paraná Health Care Network. The usability of the instrument was evaluated using the System Usability Scale, composed of 10 objective questions and one subjective question to evaluate the impressions and suggestions for improving the instrument. The data were descriptively evaluated using the SPSS® software, v.25.0. Regarding the usability evaluation, the index was 79.3, considered excellent. Among the suggestions made in the subjective question, those related to income and education indicators stand out. Usability analysis for health instruments is fundamental, as it ensures that these instruments are efficient and effective in the real context of their use. Usability directly impacts the adoption and correct use of instruments by health professionals, which, in turn, influences the quality of care provided to users.

Keywords: Oral Health. Risk Stratification. Public health. Usability.

[1] Master's student in Collective Health at the Federal University of Paraná
Federal University of Paraná
[2] Dr. in Collective Health from the Pontifical Catholic University of Paraná
[3] Bachelor of Dentistry
State University of Ponta Grossa
[4] Bachelor of Dentistry
São Paulo State University
[5] Master's student in Collective Health at the Federal University of Paraná
Federal University of Paraná
[6] Dr. in Health Sciences from the Pontifical Catholic University of Paraná
Professor at the Federal University of Paraná
[7] Post-Doctorate in Collective Health from the Federal University of Paraná
Dr. in Health Technology from the Pontifical Catholic University of Paraná
[8] Dr. in Dentistry from the Pontifical Catholic University of Paraná
Professor at the Federal University of Paraná

INTRODUCTION

The World Health Organization defines oral health as the condition of the mouth, teeth, and orofacial structures that allows an individual to perform essential functions such as eating, breathing, and speaking (WHO, 2022). Oral diseases are among the most prevalent in the world, causing serious economic and health burdens, and significantly reduce the quality of life of the population (Peres et al., 2019).

Oral health is considered an inseparable part of integral health and is directly related to the general well-being of the individual. Access to dental care reflects the principle of comprehensiveness in the Unified Health System (SUS), which advocates full attention to the health needs of individuals, approaching health in an integrated manner and considering all dimensions of well-being, including oral health (Brasil, 1990). In Brazil, the National Oral Health Policy (PNSB), known as Smiling Brazil, was created in 2004 to ensure access to dental services through the Unified Health System. In 2023, the PNSB was formally integrated into the Organic Health Law (Law No. 8,080/90) (Brasil, 1990), by Law No. 14,572/2023, transforming it into a State policy (Brasil, 2023).

Oral health is closely linked to social vulnerabilities, as socioeconomic conditions significantly influence access to and quality of dental care. Low-income groups, marginalized communities, and residents of rural areas often face greater difficulties in accessing dental care, resulting in higher rates of caries, periodontal disease, and tooth loss (Petersen, 2005). The World Health Organization recognizes that social inequalities directly affect oral health, which highlights the need for public policies that promote equity in access to health services (WHO, 2022).

The principle of equity in the SUS is one of the fundamental pillars for the promotion of social justice, it centers on the idea that everyone can have the fair opportunity to obtain their full potential and that no one should be at a disadvantage to achieve it. Equity aims to ensure that all individuals, regardless of their socioeconomic status, have access to the necessary health care, serving those in a priority manner (Brazil, 1990; Kusma et al., 2012). The underlying causes of oral health inequalities are complex and related to country-specific historical, economic, cultural, social, and political factors. The conditions in which people are born, grow up, live, work and age, as well as the unequal distribution of power, money and resources in society, are the social determinants that underlie inequalities in oral health (WHO, 2022).

Oral diseases are considered chronic conditions, which have a prolonged course and require continuous and proactive responses from the health system, professionals and patients themselves, aiming at their stabilization and effective control (Mendes, 2012). Dental caries and periodontal disease are the most prevalent Chronic Non-Communicable Diseases in the world, affecting about 3.5 billion people. Untreated tooth decay of the permanent teeth is the most prevalent, with about 2 billion cases, while severe periodontal disease follows with about 1 billion cases (WHO, 2022).

The Chronic Conditions Care Model (MACC) is a logical system that organizes the functioning of health care networks, articulating the relationships between the components of the network and health interventions. It is defined based on the predominant view of health, demographic and epidemiological situations, and social determinants of health, and is adapted to the specific temporal and social context (Mendes, 2011).

Risk stratification is a key component in the Chronic Conditions Care Model (MACC), as it allows for more effective identification and management of patients' health needs, prioritizing resources and interventions for those with the greatest need, and reducing hospitalizations and preventable complications. In addition, it facilitates the coordination of care between the different levels of care (Mendes, 2012).

Since 2014, the Oral Health Care Line of the State of Paraná has recommended the use of risk stratification in oral health (Paraná, 2014). The Oral Health Risk Stratification Instrument (ERSB) was reformulated and validated from August 2021 to June 2023. One of the stages of the validation process consists of verifying the usability of the instrument. Usability is a quality characteristic that measures how easy it is to use an interface, considering factors such as ease of learning, efficiency, memorization capacity, error reduction, and user satisfaction (Boucinha and Tarouco, 2013). The objective of this research was to evaluate the usability of the Oral Health Risk Stratification Instrument validated in the State of Paraná.

MATERIAL AND METHODS

This is an observational and cross-sectional study. The project was submitted to and approved by the Research Ethics Committee of the Paraná State Department of Health, under CAAE: 64459622.3.0000.5225 in November 2022.

To carry out the usability evaluation stage, 50 oral health teams from 29 municipalities of the 02nd Regional Health (Metropolitan) were invited to participate in a

face-to-face meeting, in which the Risk Stratification Instrument in Oral Health was presented and discussed. This event took place in August 2022 in Curitiba PR, at the School of Public Health of Paraná.

For this stage, an instruction was developed on the completion of each indicator of the instrument with the objective of guiding the oral health teams. The participating teams received the instrument and printed instructions and were invited to apply the instrument in their clinical practice and to answer, within 20 days, an electronic form with the objective of evaluating the usability of the instrument.

To assess the usability of the Oral Health Risk Stratification Instrument, the System Usability Scale, created by Brooke in 1986, was selected. This tool, although originally developed for quick evaluations, allows you to efficiently identify possible inconsistencies and collect, in a simple way, the subjective perception of users about the usability of the product. In addition, System Usability Scale is known for its high reliability and versatility (Bangor et al., 2008).

The System Usability Scale consists of ten questions evaluated on a Likert scale, ranging from one to five, with the following response options: "strongly disagree", "disagree", "neutral", "agree" and "strongly agree". Only the last question is optional and allows for an essay answer. The estimated time to complete the questionnaire is five to ten minutes (Brooke, 1995).

The following questions are part of the questionnaire, translated and adapted: 1. I think I would like to use the ERSB instrument frequently. 2. I considered the ERSB instrument to be more complex than necessary. 3. I found the ERSB instrument easy to use. 4. I think I would need the help of a technician to be able to use the ERSB instrument. 5. I considered that the various criteria and evaluation items of the ERSB instrument were well integrated. 6. I thought the ERSB instrument had many inconsistencies. 7. I suppose that most people would learn to use the ERSB instrument quickly. 8. I found the ERSB instrument to be very complicated to use. 9. I felt confident using the ERSB instrument. 10. I had to learn a lot before I was able to use the ERSB instrument.

In addition to these questions, the research team added a non-mandatory question: Do you have any criticisms and/or suggestions regarding the ERSB instrument?

After completing the questionnaire, the total score is calculated, resulting in a single number. To obtain the score, the score of each item is added, evaluated on a scale of 1 to 5. For items 1, 3, 5, 7 and 9, 1 is subtracted from the given score. In items 2, 4, 6, 8 and

10, the score received from 5 is subtracted. The sum of all values is then multiplied by 2.5, generating the total score of the usability scale. Based on this result, the evaluated system can be classified into the following categories: 20.5 (worst imaginable); 21 to 38.5 (poor); 39 to 52.5 (median); 53 to 73.5 (good); 74 to 85.5 (excellent); and 86 to 100 (best imaginable). As for the essay question, the answers were evaluated to identify impressions and suggestions for improvement for the instrument.

Data were collected and organized in Microsoft Excel® spreadsheets and descriptively analyzed using the Statistical Package for the Social Sciences - SPSS®, v.25.0. (IBM, 2017).

RESULTS AND DISCUSSION

Of the 50 oral health teams invited to participate in the research, 34 responded to the form sent, with the participation of 21 municipalities of the 02nd Regional Health Region (Metropolitan).

According to the usability questionnaire of the System Usability Scale, presented in Table 1, 32.5% of the professionals evaluated the usability index of the ERSB instrument as good, while 67.5% classified it as excellent or better imaginable. The global mean total score was 79.3, which is considered an excellent satisfaction index (Martins et al., 2015). In addition, none of the participants evaluated the instrument as poor or average, which demonstrates its excellent acceptance.

Table 1 - Result of the usability of the ERSB through the System Usability Scale.

Classification	Absolute frequency	Relative frequency
Poor/Medium	0	0
Good	11	32,35
Excellent/Best	23	67,65
Total	34	100

Elaboration: The authors.

In the System Usability Scale, the questions are structured alternating positive and negative statements, aiming to keep the statements brief, reduce response biases and encourage participants to reflect, avoiding impulsive responses (Barbosa; Foster, 2010). Figure 1 presents the descriptive result of the positive statements of the System Usability Scale, the item with the highest agreement was "I suppose that most people would learn to use the ERSB instrument quickly" (97%). This information is of great importance because it

identifies that people will not have difficulties in learning at the time of using the instrument, a positive point for the implementation of ERSB in oral health teams.

Figure 1 - Description of the indicators with positive statements.
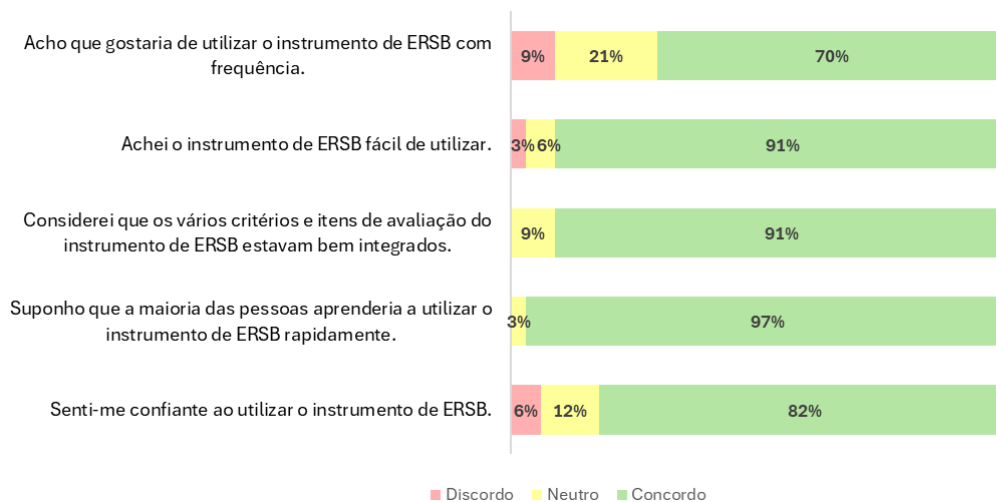
Elaboration: The authors.

Figure 2 presents the descriptive result of the negative statements, the item with the greatest disagreement was "I had to learn a lot before being able to use the ERSB instrument" (100%). This result identifies that the instrument does not present difficulties in its use, the delivery of an instruction on the use of the instrument, with the explanation of each indicator, may have been a facilitator and ensured easy learning in the use of the ERSB instrument.

Figure 2 - Description of the indicators with negative statements.
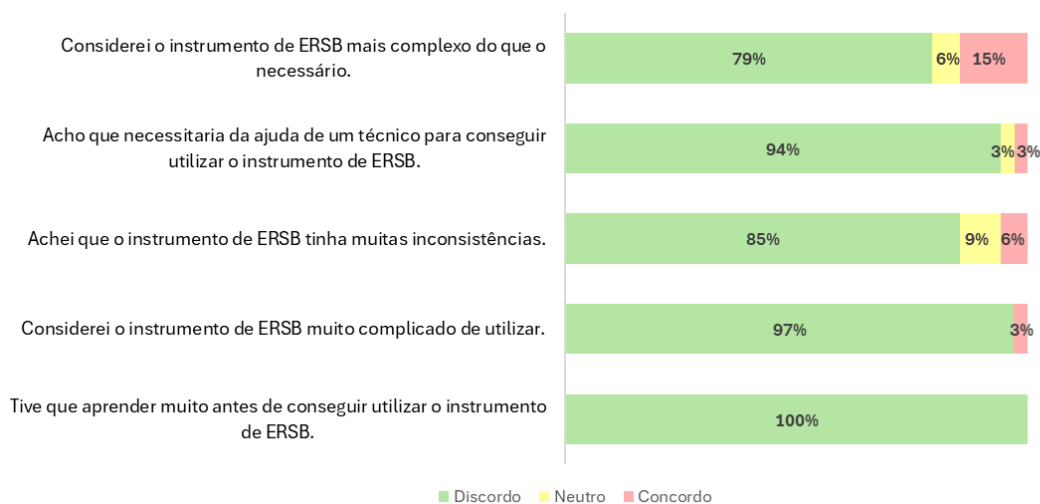
Elaboration: The authors.

The detailed evaluation of the usability of instruments that will produce information provides managers with relevant information to consider changes and updates in the available light technological resource. This analysis is essential to make the instrument more intuitive, minimize errors, and ensure accessibility for people with different abilities, facilitating the inclusion and effectiveness of the tool (Muraro et al., 2024). The ERSB usability evaluation revealed that most of the professionals who used the tool considered it adequate, which helps to increase confidence in the quality of the indicators and in the adherence of the oral health teams.

Risk stratification enables more accurate identification and efficient management of patients' health needs. It helps prioritize resources and interventions for those most at risk, contributing to the reduction of hospitalizations and preventable complications. In addition, it promotes better coordination of care between the different levels of health care (Mendes, 2012).

In oral health, the situation is no different: risk stratification also guides the organization and implementation of interventions. The identification of risk factors that predispose to oral diseases makes it possible to define degrees of priority for specific care and interventions, in addition to allowing a classification based on personal history, systemic conditions, and socioeconomic factors (Petersen et al., 2015).

In addition, the implementation of risk stratification in oral health promotes the continuing education of health professionals, enabling them to identify and manage risk factors effectively. Mendes (2012) argues that this strengthens both primary and specialized care, resulting in better health care outcomes . Risk stratification proposes to organize demand, through a dynamic process of prioritizing users according to their risk potential (Paraná, 2021).

Regarding the open and non-mandatory question, some of the suggestions were considered for improvement of the instrument, such as the reorganization of 2 indicators according to their classification in the instrument. In addition, participants reported difficulties in addressing income and education indicators, especially due to embarrassment when asking these questions to patients. However, it is recognized that income and schooling are fundamental social determinants of health. For this reason, the authors decided to keep these indicators in the ERSB instrument.

There is a consistent relationship between socioeconomic factors and the frequency and severity of oral diseases. Thus, oral condition can be seen as an important indicator of social inequality (Peres et al., 2019).

Oral health is intrinsically linked to several social factors, such as education level. Studies show that people with a higher level of education tend to have better health conditions, while lower levels are related to greater vulnerability and worse results in health indicators (Buss; Pellegrini Filho, 2007). Population groups with lower educational levels have, on average, fewer teeth compared to groups with better educational conditions (WHO, 2022).

Parental education, especially maternal education, is significantly associated with a reduced risk of dental caries in children, which highlights the importance of parents' level of education in the oral health of their children (Tanaka et al., 2013).

Habits and behaviors are also impacted by schooling. Individuals with less education and professional qualifications generally have limitations in adopting healthy habits. Oral health levels in relation to dental caries are better when the head of the family has better professional qualifications (Cypriano et al., 2011).

The relationship between oral health and income is widely discussed, as an individual's socioeconomic status exerts a direct influence on access to dental care. The lack of financial resources restricts access to oral disease prevention and treatment services, harming the oral health of people with lower economic conditions (Galvão et al., 2022).

The lack of financial resources restricts access to hygiene products, such as toothbrushes, dental floss and fluoride toothpastes. Families with higher income and knowledge in oral health tend to have better access to toothbrushes and greater frequency of brushing, which contributes to maintaining a good oral condition. (Martin et al., 2020).

Income inequality is also reflected in the choice of preventive or curative treatment. While individuals from higher social classes often enjoy prevention and follow-up consultations, those from low-income backgrounds are more likely to have undergone surgical or emergency procedures (Galvão et al., 2022).

The present study had some limitations. As this is a cross-sectional study, evaluations made at a single time point may not capture changes in perceived usability over time, as professionals become familiar with the instrument. In addition, participants were selected non-randomly, which may introduce bias in the perception of usability.

Professionals with different levels of experience or areas of expertise may not have been equally represented.

CONCLUSION

The results obtained through the application of the System Usability Scale demonstrate the importance of developing an Oral Health Risk Stratification instrument that is not only easy to use, but also has high acceptability by Oral Health Teams. The usability evaluation revealed that most of the participating professionals considered the instrument adequate and intuitive, highlighting points such as the clarity of the instructions, the speed of application and the relevance of the stratification criteria.

These findings reinforce the feasibility and potential efficacy of the instrument, promoting its implementation as a strategic tool in the State Oral Health Policy. In addition, the positive feedback from professionals indicates that the instrument has the potential to improve the teams' workflow and, consequently, improve the quality of care provided to the population.

ACKNOWLEDGMENTS

REFERENCES

1. Almeida, D. K. (2014). Correlação entre saúde bucal, condições socioeconômicas e grau de escolaridade de pacientes do PSF São Pedro na cidade de Três Corações - MG. Universidade Federal de Minas Gerais, Faculdade de Medicina, Núcleo de Educação em Saúde Coletiva, Alfenas.

2. Barbosa, D. C. M., & Forster, A. C. (2010). Sistemas de informação em saúde: A perspectiva e a avaliação dos profissionais envolvidos na atenção primária à saúde de Ribeirão Preto, São Paulo. Cadernos de Saúde Coletiva, 18(3), 424-433.

3. Bangor, A., Kortum, P. T., & Miller, J. T. (2008). An empirical evaluation of the System Usability Scale. International Journal of Human-Computer Interaction, 24(6), 574-594.

4. Brasil. (1990). Lei n.º 8.080, de 19 de setembro de 1990. Dispõe sobre as condições para a promoção, proteção e recuperação da saúde, a organização e o funcionamento dos serviços correspondentes e dá outras providências. Diário Oficial da União, Brasília, 20 set.

5. Brasil. (2023). Lei nº 14.572, de 11 de maio de 2023. Dispõe sobre a Política Nacional de Saúde Bucal e altera a Lei nº 8.080, de 19 de setembro de 1990. Diário Oficial da União: Seção 1, Brasília, DF, 12 maio.

6. Boucinha, R. M., & Tarouco, L. M. R. (2013). Avaliação de ambiente virtual de aprendizagem com o uso do SUS - System Usability Scale. Revista Novas Tecnologias Educacionais, 11(3), 1-10.

7. Buss, P. M., & Pellegrini-Filho, A. (2007). A saúde e seus determinantes sociais. Physis: Revista de Saúde Coletiva, 17(1), 77-93.

8. Brooke, J. (1995). SUS - A quick and dirty usability scale. Usability Evaluation in Industry, 189, 4-7.

9. Cypriano, S., et al. (2011). Fatores associados à experiência de cárie em escolares de um município com baixa prevalência de cárie dentária. Ciência & Saúde Coletiva, 16(10), 4095–4106.

10. Galvão, M. H. R., et al. (2022). Desigualdades no perfil de utilização de serviços odontológicos no Brasil. Ciência & Saúde Coletiva, 27(6), 2437-2448.

11. IBM Corp. (2017). IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp.

12. Kusma, S. Z., Moysés, S. T., & Moysés, S. J. (2012). Promoção da saúde: Perspectivas avaliativas para a saúde bucal na atenção primária em saúde. Cad. Saúde Pública, 28(supl.), S9-S19. Available at: https://www.scielo.br/j/csp/a/dRZhMgLvLxqsRqpGgzJPRss/

13. Martin, M., Pugach, O., Avenetti, D., Lee, H., Salazar, S., Rosales, G., et al. (2020). Oral health behaviors in very young children in low-income urban areas in Chicago, Illinois, 2018–2019. Preventing Chronic Disease, 17, 200213.

14. Martins, A. I., Rosa, A. F., Queirós, A., Silva, A., & Rocha, N. P. (2015). European Portuguese validation of the System Usability Scale (SUS). Procedia Computer Science, 67, 293-300.

15. Mendes, E. V. (2011). As redes de atenção à saúde. Brasília: Organização Pan-Americana da Saúde. ISBN: 978-85-7967-075-6.

16. Mendes, E. V. (2012). O cuidado das condições crônicas na atenção primária à saúde: O imperativo da consolidação da estratégia da saúde da família. Brasília: Organização Pan-Americana da Saúde.

17. Muraro, C. C., Rocha, G., Morais, K. B., Borba, L. O., Lopes, M. G. D., & Fidalaski, S. K. (2024). Sistema de Informação da Pessoa Idosa no Paraná: Avaliação da usabilidade pelos profissionais de saúde. Estud. Interdiscip. Envelhec., 29(supl.).

18. Paraná. Secretaria da Saúde. (2014). Rede de Saúde Bucal (1st ed.). Curitiba: SESA.

19. Petersen, P. E., Bourgeois, D., Ogawa, H., Estupinan-Day, S., & Ndiaye, C. (2005). The global burden of oral diseases and risks to oral health. Bulletin of the World Health Organization, 83(9), 661-669.

20. Petersen, P. E., & Ogawa, H. (2015). The global burden of oral diseases and risks to oral health. Bulletin of the World Health Organization, 93(9), 649-656.

21. Peres, M. A., Macpherson, L. M. D., Weyant, R. J., Daly, B., Venturelli, R., Mathur, M. R., et al. (2019). Oral diseases: A global public health challenge. Lancet, 394(0194), 249-260.

22. Steyerberg, E. W., et al. (2010). Prognostic models with competing risks: Methods and applications. Statistics in Medicine, 29(11), 1110-1123.

23. Tanaka, K., Miyake, Y., Sasaki, S., & Hirota, Y. (2013). Socioeconomic status and risk of dental caries in Japanese preschool children: The Osaka Maternal and Child Health Study. Journal of Public Health Dentistry, 73, 217-223.

24. World Health Organization (WHO). (2022). Global oral health status report: Towards universal health coverage for oral health by 2030. Geneva: World Health Organization.