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Knowledge and attitudes related to erosive tooth wear of professional wine tasters: a cross-sectional study

Conhecimentos e atitudes relacionadas ao desgaste dentário erosivo de provedores de vinho profissionais: um estudo transversal

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ABSTRACT

Objective: this study aimed to evaluate knowledge and attitudes of professional wine tasters about erosive tooth wear. **Material and Methods:** two questionnaires were applied to 56 wine tasters during the 25th National Evaluation of Wines - Safra 2017 in Bento Gonçalves, Rio Grande do Sul. Descriptive data analysis and the Fisher's exact test were performed ($p < 0.05$). **Results:** for the analysis, 56 volunteers aged 25-76 years were included. Most of the volunteers reported attending dentist once a year (55.35%) and their teeth become sorer after ingesting liquids or acid foods (32.14%) over time. The majority (82.14%) believe wine tasting may have teeth effects and have already heard about erosive tooth wear (51.78%). However, when asked about symptomatology, more than half (53.57%) reported not to know. Brushing teeth immediately after ingesting something (37.5%) and increasing the brushing frequency (33.92%) were the most cited treatment options. The habit of using mouthwash solutions was significantly associated with the professionals age ($p = 0.039$). **Conclusion:** the volunteers reported a high intake of acid substances and, although most of them reported to consult dentist regularly and have already heard about erosive tooth wear, knowledge about this condition is still limited among these professionals.

KEYWORDS

Attitude; Knowledge; Oral health; Wine; Professional wine tasters.

RESUMO

Objetivo: o objetivo desse estudo foi avaliar o conhecimento e as atitudes de provedores de vinho profissionais relacionadas ao desgaste dentário erosivo. **Material e Métodos:** dois questionários foram aplicados a 56 provedores de vinho durante a 25ª Avaliação Nacional de Vinhos - Safra 2017 no município de Bento Gonçalves, Rio Grande do Sul. Foi realizada a análise descritiva dos dados e o teste Exato de Fisher ($p < 0.05$). **Resultados:** na análise foram incluídos 56 voluntários com idade entre 25 e 76 anos. A maioria dos voluntários relatou frequentar o dentista uma vez por ano (55,35%) e que seus dentes, com o passar do tempo, tornaram-se mais doloridos ao ingerir líquidos ou alimentos ácidos (32,14%). Mais da metade (82,14%) acreditam que as provas de vinho podem causar algum efeito sobre os dentes e já ouviram falar em desgaste dentário erosivo (51,78%). Porém, quando questionados sobre a sintomatologia, a maioria (53,57%) afirmou não ter conhecimento. Escovar os dentes imediatamente após ingerir algo (37,5%) e aumentar a frequência de escovação (33,92%) foram as opções mais compreendidas como tratamento. Utilizar soluções para bochecho esteve significativamente associado à idade dos profissionais ($p=0,039$). **Conclusão:** provedores de vinho profissionais relataram alta ingestão de substâncias

ácidas e, embora a maioria consulte pelo menos uma vez por ano o dentista e já tenha ouvido falar a respeito do desgaste dentário erosivo, o conhecimento sobre essa condição ainda é limitado entre esses profissionais.

PALAVRAS-CHAVE

Atitudes; Conhecimento; Saúde oral; Vinho; Provedores de vinho profissionais.

INTRODUCTION

Some professions make their professionals more vulnerable to the action of agents that cause oral changes due to the functions that the professionals perform [1]. Professional wine tasters from all around the world have an occupational risk: these professionals are more likely to develop erosive tooth wear because they have a high frequency of acidic beverage intake [2-5].

Erosive tooth wear is defined as a chemical-mechanical process of non-bacterial origin, in which cumulative loss of hard tissue occurs. The etiology may be classified as extrinsic or intrinsic [6-9]. Intrinsic causes include the action of endogenous acids from gastroesophageal reflux disease, rumination syndrome, alcoholism or nervous system disorders such as anorexia and bulimia [10].

However, the extrinsic dietary factors are the most common etiological agents [11]. Wine, for example, has a high erosive potential because of their high acid content derived from their fruits, being the tartaric and malic acid the most abundant, its low pH, which varies from 3 to 4, and its low concentrations of ions relevant to hydroxyapatite, such as Ca^{+2} and PO_4^{-3} [5,12-15].

The consumption of wine in Brazil has shown sharp growth. Data from the International Trade Secretariat of the Ministry of Industry, Foreign Trade and Services, for the period starting in 1995 to 2014, showed that Brazilian imports of foreign wines presented a growth rate of 11.2% per year [16]. Thus, wine production also increased in Brazil. The main producing region, Serra Gaucha (Rio Grande do Sul), has shown increasing sales and the number of wineries in this area has grown from 439 in 2001 to 738 in 2009 [17]. In addition, according to data from the International Organization of Vine and Wine (OIV), Brazil ranked in 2012 among the 20 most important countries in the world in wine production, occupying the 14th position [16].

With the growing rise of the wine industry in Brazil, it is necessary to pay attention to the health of professionals involved in these processes, because professional wine tasters are very susceptible to the negative effects of wine on oral health [18]. During the tasting, the wine is sipped and rinsed for a time that can vary from six to 60 seconds, increasing the risk of erosive tooth wear among professionals [4,13]. In the long term, the effects of erosive tooth wear may include tooth sensitivity, tooth yellowing and pulp necrosis in more severe cases [11,18-20]. Therefore, it is important for dental professionals to be able to diagnose the condition as early as possible to identify the possible etiology and establish appropriate treatment according to the patient's profile [21].

It is highlighted the importance of the patient's education about the etiology and consequences of the erosive tooth wear to the control and management of this process [22,23]. The main strategy to be adopted is the elimination of the etiological agent through orientation and awareness about the causes [19,24]. However, it is known that the elimination of this causal agent is often difficult to achieve, either for medical, psychological, social or occupational reasons.

The first stage in any behavior change program is to assess and understand the internal and external conditions that affect how an individual thinks or acts [25]. Thus, the aim of this study was to evaluate attitudes related to oral hygiene, eating and occupational habits, as well as the knowledge of professional wine tasters related to erosive tooth wear.

MATERIALS AND METHODS

This quantitative, descriptive and cross-sectional study, whose volunteers were professional wine tasters, was conducted in accordance with the 1964 Helsinki Declaration and it was approved by the local Human Research and Ethics Committee (#2.024.551). To be volunteers of this study, 120 professional wine

tasters who participated of the 25th National Wine Assessment - 2017 Harvest, in Bento Gonçalves, Rio Grande do Sul, Brazil, were invited. This event was organized by the Brazilian Association of Oenology to professional wine tasters from all over Brazilian states.

After the consent and signature of the professionals who agreed to participate in the study, the volunteers answered two questionnaires used as a tool for data collection. The first questionnaire was elaborated by the researchers to complement data referring mainly to the overall health of the professional wine tasters and their eating and oral hygiene habits. The second questionnaire applied was a structured and validated questionnaire [26]. This questionnaire contained information on gender, age, education level and monthly individual income. In addition, participants also answered questions about medical history, oral hygiene, eating and occupational habits. Medical issues included information about the presence of systemic diseases, gastroesophageal reflux, rumination syndrome, alcoholism or nervous system disorders such as anorexia and bulimia.

Regarding eating habits, the number of daily meals, the frequency and quantity of foods and beverages that are commonly associated with erosive tooth wear (such as orange, lemon and apple juices, carbonated drinks and acidic fruits) were evaluated. Concerning oral hygiene habits, participants answered questions regarding the frequency of dental appointments, number of daily tooth brushing, interval from the last visit to the dentist and the items used to perform oral hygiene, as well as the type of brush. Regarding occupational information, the time (in years) working as wine tasters, frequency, quantity and duration of wine tasting sessions per week and oral hygiene habits after tasting were evaluated. Knowledge about erosive tooth wear has been analyzed with questions about symptomatology, treatment, whether they already have heard about erosive tooth wear, whether they believe wine tasting can affect the teeth and whether erosive tooth wear may be the same as dental caries. The participants received a brief explanation about signs and symptoms of the erosive tooth wear in the second part of the second questionnaire, so that they could proceed with the questionnaire, answering questions regarding the self-perception of signs and symptoms, as well as the age at which this

perception occurred and what they would do to confront this problem.

Statistical analysis

All data were analyzed descriptively. Fisher's Exact test was used to assess the relationship between gender and age with frequency of dental appointments, to rinse water after wine tastings, oral hygiene frequency, to use mouthwash, to perform oral hygiene after wine tastings, to believe that erosive tooth wear and dental caries are the same conditions and if the professional has heard about erosive tooth wear. The variables chosen were those considered the most clinical relevance by the researchers and could be categorized for the test application. The SPSS software (IBM SPSS Statistics 20.0) was used, and the level of statistical significance was set at $p < 0.05$.

RESULTS

Participated in the study 56 professional wine tasters (47 men and 9 women). The median and mean age were 39 and 42.25, respectively. The majority (80.35%) had completed higher education, 14.28% had completed high school and 5.36% showed incomplete higher education. Most of the participants reported having individual monthly income exceeding seven minimum wages (44.62%), followed by incomes between three to five (21.4%), five to seven (17.8%) and one to three minimum wages (14.28%).

Regarding the frequency of dental appointments (Figure 1), more than half (55.35%) reported going to the dentist at least once a year, 16.07% said going twice, 14.28% said going three or four times, 7.14% stated five times and a minority (5.36%) reported attending less than once a year. Half of the professionals reported that their last dental appointment was less than six months ago, while 37.5% had last gone in a period ranging from six to 12 months, over a year ago (5.36%) and another small portion did not respond (7.14%). Most reported performing oral hygiene three times a day (60.71%), followed by those who perform twice (19.64%), once (12.5%) or more than three times a day (7.14%). Toothbrush (96.42%) and fluoride toothpaste (91.07%) are items used by almost all professionals. In addition, some reported to use mouthwash solutions (30.35%), dental floss (21.42%), interdental brushes (3.6%)

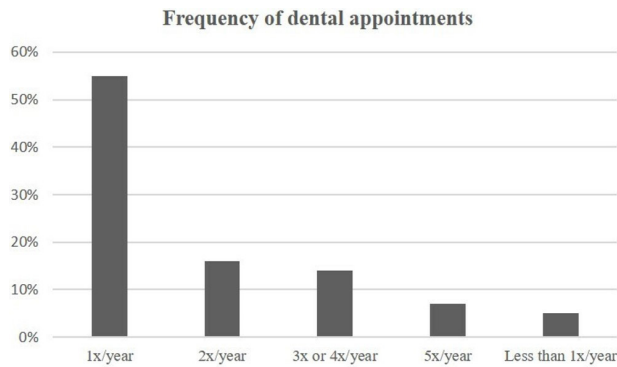


Figure 1. Number of dental appointments per year by professional wine tasters.

and only one reported to use unituft brush. About the bristles of the toothbrush, almost half (48.21%) use soft bristle brushes, medium bristles (33.92%), extra soft bristles (5.36%), some volunteers could not inform the type of bristles (12.5%) and only one of them reported to use a hard bristle brush.

The majority (51.78%) of professionals have heard of erosive tooth wear, while 44.64% said they had never heard and two did not know or had difficulty to respond (Figure 2). Most (78.5%) answered to know that erosive tooth wear is not the same as dental caries, while two volunteers have confused these conditions. Regarding the erosive tooth wear symptoms, most of the volunteers (53.57%) answered that they do not possess the knowledge of it. However, other volunteers reported to believe that the sensation of pain or sensitivity when drinking hot and cold beverages or eating acidic or sweet foods (28.57%), teeth with thinner edges (19.64%), with fractures on the dental edges (10.7%), yellow teeth (7.14%) or smoother and shinier dental surfaces (1.78%) are symptoms caused by erosive tooth wear (Figure 3). In order to confront the symptoms of the erosive tooth wear, a great number of professionals (71.42%) stated that they would go to a dental appointment, some professionals would brush their teeth more often (25%), have regular dental revisions (19.64%), decrease their acids intake (10.7%), change toothpaste (10.7%), brush their teeth immediately after eating something (8.92%), decrease their intake of beverages or foods that cause sensitivity (5.36%) and use dental floss, do dental prophylaxis and a tooth whitening (3.57%).

About the treatment of erosive tooth wear, most professionals believe that brushing their

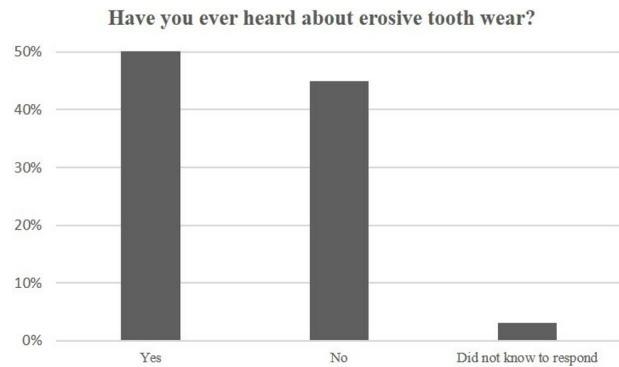


Figure 2. Professional wine tasters responded if they have ever heard about erosive tooth wear.

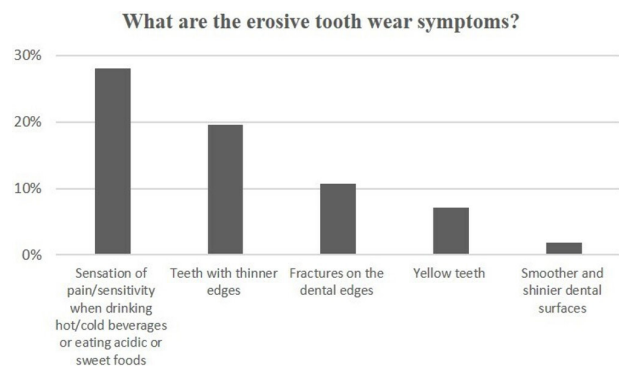


Figure 3. Professional wine tasters responded what are the symptoms of erosive tooth wear.

teeth immediately after eating something (37.5%) or increasing the frequency of teeth brushing (33.92%) is the most appropriate. Others did not know or had difficulty to answer this question (30.35%) and only one professional believes that brushing their teeth harder is ideal, while 12.5% believed that none of the proposed options was suitable as a treatment for erosive tooth wear (Figure 4).

When they were asked if the wine tasting can cause any effect on teeth, most participants (82.14%) answered that there is a relationship between wine and dental changes (Figure 5). About the changes that may occur, 13 reported “teeth darkening”, 11 reported “tooth sensitivity”, 8 reported “presence of dental stains”, 7 reported “yellow teeth”, 5 reported “erosive tooth wear”, 3 reported “presence of dental calculus”, 2 people reported “corrosion”, one volunteer related “aesthetic problems” and another volunteer “temporary darkening”.

Almost all participants (96.42%) reported having had dental caries or having had their teeth restored at some time of their lives. When they compare their current dental condition

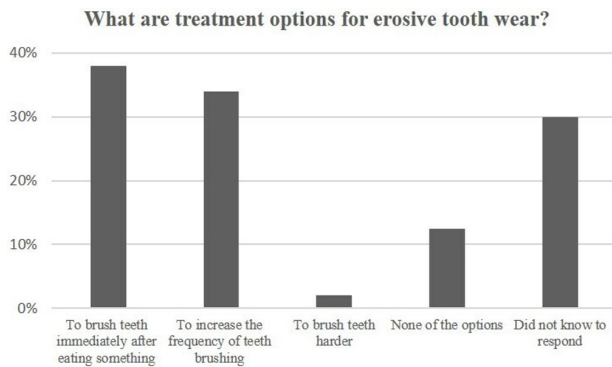


Figure 4. Professional wine tasters responded what are treatment options for erosive tooth wear.

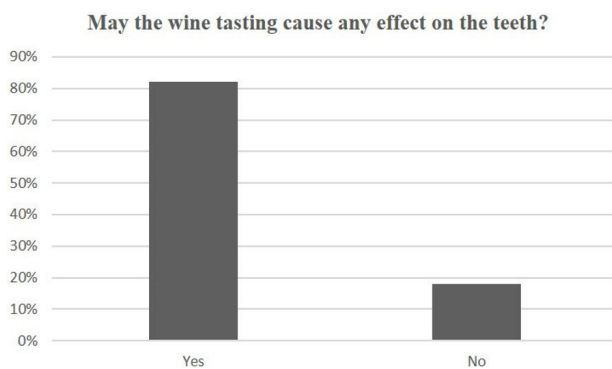


Figure 5. Professional wine tasters responded if the wine tasting may affect their teeth.

to when they were younger, participants reported that their teeth are more yellowed (48.2%) and more sensitive and painful when drinking cold or hot liquid or eating acidic and/or sweet foods (32.14%). Furthermore, other participants answered that their teeth currently have fractures on the dental edges (30.35%), thinner dental edges (25%) and more brightness and smoothness (5.36%). Only 14.28% of the volunteers reported not having noticed any of the situations listed (Figure 6).

In the second part of the first questionnaire, participants received a brief explanation about the signs and symptoms of erosive tooth wear. Regarding them, some participants (30.35%) do not know or do not remember the age when they first noticed these signs and symptoms. Others noticed that the first symptoms appeared between 31 and 40 years old (23.21%), 21 and 30 years old (16.07%), 20 years old or younger (8.92%), between 41 and 55 years old (7.14%) and 14.28% did not answer this question.

Regarding signs and symptoms, when the professionals were asked if they were

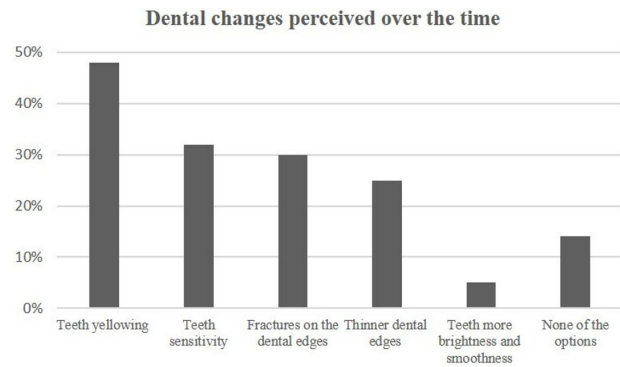


Figure 6. Professional wine tasters responded about self-perceived dental changes over time.

currently presenting the following conditions, the percentage of answers were yellowed teeth (46.4%), with fractures on the dental edges (39.28%), with thinner dental edges (33.9%), reduced in size due to erosive tooth wear (23.21%) or smoother and brighter tooth (5.36%). Only three professionals are not concerned with these signs and symptoms.

Most professionals (82.14%) reported to have three daily meals (breakfast, lunch and dinner) and 12.5% two meals (lunch and dinner). Among these main meals, they also reported eating snacks, fruits, desserts, or drinking other types of beverages, besides water or tea, once or twice a day (35.78%), three or four times a day (32.14%), five or six times a day (19.64%) and more than seven times a day (7.13%). When they are not working, all participants reported daily wine consumption, fruit juice (87.5%), sparkling wine (85.7%), citrus fruits (75%) and soft drinks (25%) (Figure 3).

Regarding their health condition, two participants reported: “reasonable”, “good” or “very good” (96.4%). Most professionals (78.6%) reported not having a systemic disease or using continuous medication (64.3%). None of them reported to have bulimia, but two reported alcoholism disease and rumination syndrome. Gastroesophageal reflux disease was reported by seven professionals.

The professional wine tasters hold in median three wine tasting sessions per week lasting in median one hour and 30 minutes each. Almost all participants (87.48%) have been working as professional wine tasters for at least 10 years (median working time 19.4 years). After wine tasting, almost half (46.42%) do not perform any type of oral hygiene, others rinse with water

(44.64%) or brush with toothpaste (14.2%). The alternatives in the question regarding the use of fluoride mouthwash, dental floss and brushing without toothpaste were marked by one participant each (Figure 3).

No significant correlation was observed between gender of the professional with the following variables: frequency of dental appointments, rinsing water after wine tastings, using mouthwash, oral hygiene frequency and performing oral hygiene after wine tastings ($p > 0.05$) (Table 1). Regarding the use of mouthwashes during oral hygiene, it was observed that younger professionals (< 41 years old) usually use them more frequently than older professionals ($p = 0.039$). However, no significant correlation was observed between age and frequency of dental appointments, if the professional has heard about erosive tooth wear, rinsing water after wine tastings, oral hygiene frequency and performing oral hygiene after wine tastings ($p > 0.05$) (Table 2).

DISCUSSION

In the last years, according to OIV statistical, the global consumption of wine has been increased and, particularly in Brazil, there is no study to date, which assessed knowledge and attitudes

of wine tasters. The questionnaires applied in this study addressed questions regarding the perception of signs and symptoms that may be related to erosive tooth wear. However, it was not the aim of this study to evaluate the prevalence of erosive tooth wear in professional wine tasters. In the literature, this relationship is already reported in studies that show a higher prevalence of erosive tooth wear in professional wine tasters [3-5,14].

In our sample, the median working time was 19.4 years. Previous studies have already reported the relationship between prevalence and severity of erosive tooth wear lesions with the number of years exerting the profession [3,5,18]. Besides, the wine tasters reported to do in average three wine tasting sessions per week. However, when they are not working the consumption of other acidic substances is also high. All participants reported consuming wine daily and fruit juice consumption was reported by 87.5%, as well as sparkling wines (85.7%) and citrus fruits (75%). A similar result was found in a study conducted in Sweden with 14 professional wine tasters with erosive tooth wear, in which, after the analysis of their 7-day food plan, the authors noted that 12 of them reported consuming citric fruits and wine during dinner every day [5]. Thus, professional wine tasters are often exposed to the action

Table 1 - Relationship between gender and oral hygiene habits

	Frequency of dental appointments		Rinse water after wine tastings		Use mouthwash		Oral hygiene frequency		Perform oral hygiene after wine tastings	
	1x/year	2x/year or more	Yes	No	Yes	No	Up to 2x/day	3x/day or more	Yes	No
Female	28	19	20	10	16	31	18	29	23	24
Male	6	3	11	15	1	8	1	8	6	3
Total	34	22	31	25	17	39	19	37	29	27

Homogeneous variables ($p > 0.05$). Fisher's exact test.

Table 2 - Relationship between age, oral hygiene habits and if the professional wine taster have heard about erosive tooth wear

	Frequency of dental appointments		Have you ever heard about erosive tooth wear?		Rinse water after wine tastings		Use mouthwash*		Oral hygiene frequency		Perform oral hygiene after wine tastings	
	1x/year	2x/year or more	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
< 41 years	22	13	17	18	20	10	14	21	12	23	18	17
≥ 42 years	12	9	12	9	11	15	3	18	7	14	11	10
Total	34	22	29	27	31	25	17	39	19	37	29	27

*Statistically significant $p = 0.039$. Other homogeneous variables ($p > 0.05$). Fisher's exact test.

of non-bacterial acids in the oral cavity, even when they are not working leading their dental surfaces, when in prolonged contact with low pH substances, to erosive tooth wear [2].

In our study, the professionals reported that wine tasting sessions usually last one hour and 30 minutes and they taste different types of wines. In a study in Norway, it was found that tasters usually taste 20 to 40 wines per session. Each wine is held in the mouth for about six seconds and during this time the wines are rinsed to stimulate the taste buds before they are swallowed or expelled [4]. This long and frequent exposure to low-pH beverages increases the probability of erosive tooth wear compared to rapidly swallowed beverages [27].

The majority of wine tasters reported to go regularly to the dentist (55.35% once a year and 37.49% twice or more) and more than half of the sample reported to believe that wine tasting could have some effect on teeth (82.14%), heard about erosive tooth wear (51.78%) and observed dental changes in themselves over time. However, these conditions did not mean knowledge about erosive tooth wear, since most volunteers (53.57%) reported not to know the symptoms of erosive tooth wear and that the most reported treatment options as being the increasing of the frequency of brushing (33.92%) and brushing the teeth immediately after eating some acidic food or drink (37.5%). However, in the literature, the ideal time to tooth brush after the consumption of acidic substances is controversially discussed.

In the literature, some studies indicate that saliva minimizes erosive tooth wear due to its capacity for tamponade, remineralization and acquired pellicle formation [28,29]. The acquired pellicle would be able to protect dental tissues by acting as a barrier, preventing direct contact between acids and the tooth surface [30]. Thus, some authors recommend that patients at high risk for erosive tooth wear wait 30 to 60 minutes to perform tooth brushing after eating acidic foods or beverages [9]. However, there are *in situ* studies that have not found a significant effect of saliva on demineralization processes [31,32]. Thus, it is currently discussed in the literature to delay tooth brushing after ingesting acidic substances is not as effective preventive measure as it is usually recommended, because the demineralized dental surface with the effect of acids will be eroded by soft tissue action (tongue,

cheek or occlusal contacts), even in the absence of brushing [33,34]. However, regardless of when tooth brushing will be performed, the recommendation is to always do it with a soft or extra-soft toothbrush and fluoride toothpaste [35]. Sugar-free chewing gum may also be indicated because it increases salivary flow and collaborates with tissue remineralization [36].

After the wine tastings, part of the professionals (46.42%) said they do not realize oral hygiene and another portion (44.64%) reported rinse their mouth with water. After consume of low pH substances is recommended to rinse their mouth with water because the water contributes to the neutralization of acids in the oral cavity [36]. Therefore, all professional wine tasters should be encouraged to develop this habit after tasting. Our findings suggest that in older professionals this encouragement should be done even more closely, as these tasters were less likely to adopt the preventive habits, considering that the use of mouthwash was reported less frequently by them ($p = 0.039$).

Fluoride toothpastes, fluoride varnishes, fluoride gels and fluoride solutions have been reported as preventive strategies because the fluoride is able to increase the enamel resistance to acid dissolution [37]. Although erosive tooth wear is an aggressive process, the knowledge about the best strategy for fluoride application to prevent or control the process is still debated [35]. Thus, different fluoride formulations and different commercial vehicles are being studied for a more effective preventive action. In the literature, *in situ* studies have already shown the beneficial of stannous fluoride toothpastes and mouthwashes in reducing tissue loss involved in erosive processes [38,39]. Besides, an *in vitro* study compared toothpastes with 1.100ppm and 5.000ppm sodium fluoride and indicated an additional preventive action of 26% and 53% respectively when compared to placebo toothpaste [40]. However, the systematic reviews currently available in the literature also indicate the low evidence of the use of fluorides, delivered as varnishes, dentifrices and other remineralizing agents, for the prevention and management of erosive tooth wear [41].

Our outcomes, as well as in other studies in literature, evidence a general lack of knowledge among professionals regarding erosive tooth wear. Thus, it is necessary to discuss that these

findings may indicate that there is a lack of awareness among dentists about the diagnosis and etiological factors associated with the erosive tooth wear, as well as the transmission of knowledge from professional to patient. A previous study reported that seven of nine wine tasters with erosive tooth wear and had gone to the dentist in a short time were not informed about the presence of this condition, although in five of them the lesions already compromised dentine tissue [4]. Besides that, other study reported that only one of 19 professional wine tasters had been informed by his dentist that the erosive lesions would probably be associated with occupational exposure [5]. In fact, the diagnosis and identification of etiological factors are not so simple to do, considering that erosive tooth wear involves a series of additional modifying factors and usually occurs simultaneously with dental abrasion and attrition [30]. However, the dentist should be aware of these changes when dealing with professionals who are exposed to various occupational risks, considering that management and non-progression of the condition become more difficult to achieve.

This discussion about the oral health of professionals, although important, has been little studied [1]. Professional wine tasters are a risk group to develop erosive tooth wear, but they do not have a clear understanding about the process. Knowledge in oral health is considered an essential prerequisite for health-related behavior. People who are able to assimilate health knowledge have a greater sense of personal control over their oral health and are more likely to adopt self-care practices [42]. Thus, it is important to increase the knowledge production with this theme to implement more effective programs aimed to professionals' health. Therefore, although our sample is limited, our results seek to stimulate the development of further studies in this important area of oral health care, which is sometimes neglected.

Therefore, dentists must be aware of the occupational risks that certain professionals are submitted. Thus, preventive strategies focused on different population groups can be properly addressed during the management of these patients. To the non-advancement and/or prevention of erosive tooth wear in professional wine tasters is important that the dentist identifies these professionals and explains to them about the occupational risk that they are

submitted. Dietary advice, fluoride application and encouragement of proper oral hygiene with the use of soft toothbrush, controlled brushing force and fluoridated toothpaste are preventive measures that may be adopted.

CONCLUSIONS

Oral health education is fundamental to help the population understand the diseases and changes that affect their oral cavities. Comprehensive knowledge of different risk and protective factors is an essential prerequisite for proper prevention and control measures.

Professional wine tasters are part of a group more likely to develop erosive tooth wear. These professionals reported high ingestion of acidic substances, even when they are not working. However, while the majority go to the dentist at least once a year and have heard about erosive tooth wear, knowledge about this condition is still limited among these professionals.

Author's Contributions

BPO, NMS, NCS, TMOV: Conceptualization. BPO, NMS, NCS, TMOV: Methodology. BPO, NMS, NCS, TMOV: Software. BPO, NMS, NCS, TMOV: Formal Analysis. BPO, NMS, NCS, TMOV: Investigation. BPO, NMS, NCS, TMOV: Resources. BPO, NMS, NCS, TMOV: Data Curation. BPO: Writing – Original Draft Preparation. BPO, NMS, NCS, TMOV: Writing – Review & Editing.

MARB, JAR: Supervision. MARB, JAR: Project Administration.

Conflict of Interest

No conflicts of interest declared concerning the publication of this article.

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Regulatory Statement

This study was conducted in accordance with all the provisions of the local human subjects oversight committee guidelines and policies of:

Local Human Research and Ethics Committee. The approval code for this study is: 2.024.551.

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