

# Attitude of Italian dental practitioners toward bruxism assessment and management: A survey-based study

Davide Cannatà<sup>1</sup> | Francesco Giordano<sup>1</sup> | Maria Lavinia Bartolucci<sup>2</sup> | Marzio Galdi<sup>3</sup> |  
Rosaria Bucci<sup>3</sup> | Stefano Martina<sup>1</sup> 

<sup>1</sup>Department of Medicine, Surgery and Dentistry "Scuola Medica Salernitana", University of Salerno, Baronissi, Italy

<sup>2</sup>Section of Orthodontics and Sleep Dentistry, Department of Biomedical and Neuromotor Sciences (DIBINEM), University of Bologna, Bologna, Italy

<sup>3</sup>Department of Neurosciences, Reproductive Sciences and Oral Sciences, University of Naples Federico II, Naples, Italy

## Correspondence

Stefano Martina, Department of Medicine, Surgery and Dentistry "Scuola Medica Salernitana", University of Salerno, Via Allende, 84081, Baronissi (SA), Italy.  
Email: [smartina@unisa.it](mailto:smartina@unisa.it)

## Abstract

**Introduction:** Bruxism is a spectrum of masticatory muscles activities. According to the recent evidence and international consensus, there is no indication to treat bruxism unless clinical consequences are present. The aim of the present study was to investigate the approach of Italian dentists to bruxism in their clinical practice.

**Methods:** An anonymous online survey was developed, composed by 26 items grouped into five sections: (1) Characteristics of the respondent (Q1–Q6); (2) Bruxism frequencies (Q7–Q11); (3) Bruxism assessment (Q12–Q15); (4) Bruxism management (Q16–Q20); (5) Occlusal splints therapy (Q21–Q26).

**Results:** A total of 384 practitioners, including specialists and non-specialists, participated in this survey. The majority of the respondents reported that 1–3 out of ten patients presented with bruxism. The diagnosis is mainly performed with non-instrumental methods, and facial pain and dental wear are the major clinical consequence associated with bruxism. Almost the entire sample of respondents report to offer occlusal splints to bruxism patients, and 41% refer to perform occlusal adjustments. Almost half of the respondents have never proposed any form of cognitive-behavioural therapy.

**Conclusion:** The results of the current survey highlighted several inconsistencies in Italian dentists' approaches to bruxism, suggesting the need for better education of practitioners and for the development of a standardized protocol to assess and manage bruxism in dental practices.

## KEYWORDS

bruxism, dental, occlusal splint, oral rehabilitation, practice management

## 1 | INTRODUCTION

Bruxism is an umbrella term that embraces a broad spectrum of masticatory muscle activities (MMA) that are not necessarily associated with the presence of tooth contact.<sup>1</sup>

In relation to the circadian phenotype, two different clinical conditions were described. The MMA, which can be rhythmic (phasic) or non-rhythmic (tonic) and occurs during sleep, has been

referred to as sleep bruxism (SB).<sup>2</sup> Instead, the MMA characterized by repetitive or sustained tooth contact and/or by the bracing or thrusting of the mandible while awake has been defined as awake bruxism (AB).<sup>2</sup>

The MMA that occurs during sleep or while awake can be a risk factor for negative clinical consequences, resulting in, e.g., masticatory muscle hypertrophy, fatigue or pain, mechanical tooth wear, prosthodontic complications, headaches, and temporomandibular joint pain.<sup>3–6</sup>

Increasing evidence suggests that both AB and SB are multifactorial phenomena,<sup>7-9</sup> but AB seems to be more directly linked to psychological traits whereas neurobiological mechanisms are probable primary factors involved in SB origins.<sup>10</sup>

Approaches for assessing bruxism can be non-instrumental (i.e., a self-report questionnaire, oral history, and clinical inspection) or instrumental (through electromyography, polysomnography, Ecological Momentary Assessment or the Experience Sampling Method).<sup>2</sup> A Standardized Tool for the Assessment of Bruxism, including a combination of subject-based, clinically based and instrumentally based information, has recently been described, but it still needs on-field testing and refinement.<sup>11</sup>

A recent international consensus of worldwide experts pointed out that, in otherwise healthy individuals, bruxism should be considered as a behaviour, not as a disorder, and thus may not mandate treatment. Treatment should be considered only when this behaviour is harmful. Furthermore, unless the underlying mechanisms are identified, treatment should be aimed at managing implied clinical outcomes.<sup>2,10,12</sup> Accordingly, dentists should ascertain the presence of the behaviour and, if present, make a weighted decision on whether and how to manage it, depending on associated health outcomes and identified specific causes.<sup>13</sup> In the absence of known causes, the so-called "Multiple-P" approach could be considered as the standard of reference, including pep talks (counselling), psychology (cognitive-behavioural strategies), physiotherapy, plates (occlusal splints) and pills (drugs).<sup>12,14</sup> Performing irreversible occlusal changes to manage bruxism is not recommended.<sup>12,14</sup>

Nevertheless, a multiplicity of strategies to assess and manage bruxism are in place and a standardized approach has not yet been validated.<sup>15</sup> Consequently, many surveys conducted in different countries of the world<sup>16,17</sup> highlighted inconsistencies in dentists' approaches to bruxism in clinical settings, suggesting gaps in practitioners' knowledge about this issue.

To the best of our knowledge, there is no information about Italian dental practitioners' encounters with bruxism within their practices and their approaches to this condition. Therefore, the primary aim of this study was to investigate the clinical practices of a sample of Italian dentists when dealing with bruxism and measure inconsistencies between diagnostic approaches (i.e., methods practitioners use to ascertain the presence of the behaviour, specific causes, and associated health outcomes they look for) and management strategies (i.e., intervention criteria, goals of treatment and treatment options they offer their patients).<sup>12,14</sup> Furthermore, as occlusal splints is reported to be one of the most frequent treatment option chosen by general dentists,<sup>16,17</sup> the present study aimed secondarily to analyse practices related to the use of occlusal splints among Italian dentists, i.e., splint designs and prescribed patterns.

## 2 | MATERIALS AND METHODS

The evaluation of clinical practices among Italian dentists was performed in the form of an anonymous online survey, consisting of a

26-item questionnaire developed by two orofacial pain experts (R.B. and S.M.), divided across five sections: (1) Characteristics of the respondent (Q1-Q6); (2) Bruxism frequencies (Q7-Q11); (3) Bruxism assessment (Q12-Q15); (4) Bruxism management (Q16-Q20); (5) Occlusal splint therapy (Q21-Q26).

The included questions were modelled after a questionnaire proposed by Guillot et al,<sup>17</sup> and adaptations were made to better achieve the present study objectives. The survey was piloted on a group of 10 dentists before use, and adjustments were made to improve its clarity. The modified version of the questionnaire was then piloted on a different sample of five dentists.

The questionnaire was distributed via electronic message made with *Google Forms* (<https://www.google.com/forms/about/>), including an internet link to access the questionnaire and a cover letter, explaining the purpose of the survey, assuring participants the anonymity of responses and requesting participation. No financial incentive was provided for responding to the survey.

The recruitment of Italian practitioners was carried out through Facebook (Meta Platforms) since it has proven to be a cost-effective means to recruit for online survey research.<sup>18,19</sup> The electronic message was spread through various modalities supported within the Facebook platform, e.g., public posts on dental network group pages and private messages.

Participants could only respond to the survey once, and it was impossible to modify responses after successful submission.

Considering the total number of dental practitioners in Italy (about 60000 according to Eurostat data), the target sample size for the survey was calculated at 382 participants (with a 95% confidence margin).

Data from the questionnaire replies were collected and qualitatively summarized by a descriptive statistical analysis using Microsoft Excel software 2019 (Microsoft Corporation), and frequencies and percentages were computed for each item.

The first public posts with the standardized recruitment message and survey link were shared on the Facebook platform on December 1, 2021, at 12:00. The first private messages were sent on the same day. Follow-up reminder posts and messages at 2, 4, and 8 weeks were made.

Response collection was terminated on March 2, 2022, at midnight.

## 3 | RESULTS

Out of the 384 practitioners who participated in the survey, six did not answer questions from 21 to 26 (optional questions). Participant's characteristics, included in [Table 1](#), showed that most of respondents were female (52.6%), between 30 and 40 years of age (41.4%), who obtained an additional qualification after graduating in dentistry (63.6%). They mainly worked as consultants for dental practices (42.2%), and the main or sole activity of a half of them was orthodontics or orofacial pain (50.0%).

According to most of respondents (54.7%), 1-3 out of ten patients presented with bruxism, mainly affecting the young adult age

TABLE 1 Characteristics of the respondents (Q1–Q6).

Answer options	Response percentage	Response count
Q1—How old are you?		
R1-<30	27.6	106
R2-30-40	41.4	159
R3-41-50	16.7	64
R4->50	14.1	54
Q2—To which gender identity do you identify?		
R1-male	47.4	182
R2-female	52.6	202
R3-not listed	0	0
R4-prefer not to answer	0	0
Q3—What is your highest degree?		
R1-degree in dentistry	36.5	140
R2-specialty	36.5	140
R3-MSc	15.6	60
R4-PhD	11.5	44
Q4—How many years have you been in the dental profession?		
R1-1-5 y	35.4	136
R2-6-10 y	21.9	84
R3-11-20 y	22.9	88
R4->20 y	19.8	76
Q5—Where do you mainly practice your clinical activity?		
R1-private practice	29.2	112
R2-group practice	11.5	44
R3-consultancy activity	42.2	162
R4-hospital/public health facilities	8.0	30
R5-University	9.4	36
R6-not listed	0	0
Q6—Is your main, or sole, activity in one of the following disciplines?		
R1-no	31.3	120
R2-paediatric dentistry	3.1	12
R3-orthodontics and/or orofacial pain	50.0	192
R4-oral surgery	12.5	48
R5-other	3.1	12

groups (49.0%; between 25 and 40 years of age), with no difference between genders (41.7%), as shown in Table 2.

The third section of questionnaire, as shown in Table 3, revealed that the diagnosis of bruxism is mainly performed with non-instrumental methods, including intra-oral clinical examination (95.3%) and patient's history (87.5%). When interviewing patients, most frequently subject-based information investigated are clenching/grinding of the teeth when asleep (90.1%) and/or awake (79.7%), facial pain (77.6%), stress and anxiety (69.3%). Minor percentages explore oral parafunctions (38%), sleep disorders (37.0%), genetics

TABLE 2 Bruxism frequencies (Q7–Q11).

Answer options	Response percent	Response count
Q7—How often do you visit patients presenting with self-report of bruxism activity?		
R1-hardly ever (less than 1 in 100 cases)	2.6	10
R2-rarely (1–9 in 100 cases)	28.6	110
R3-sometimes (10–30 in 100 cases)	54.7	210
R4-frequently (more than 30 in 100 cases)	14.1	54
Q8—Which of these statements reflects the most frequent source of information the patients have about their bruxism?		
R1-referred by a bed partner/ someone who sleeps with the patient	31.8	122
R2-referred by the patients themselves	59.4	228
R3-referred by another dentist	4.7	18
R4-referred by another professional	4.2	16
Q9—How often do you diagnose bruxism in patients without complaint of bruxism?		
R1-hardly ever (less than 1 in 100 cases)	7.8	30
R2-rarely (1–9 in 100 cases)	35.4	136
R3-sometimes (10–30 in 100 cases)	50.0	192
R4-frequently (more than 30 in 100 cases)	6.8	26
Q10—In your clinical practice, which age group experience bruxism the most?		
R1-children (<10 y/o)	10.4	40
R2-adolescents (10-18 y/o)	3.1	12
R3-young adults (19-25 y/o)	13.5	52
R4-adults 25-40 y/o	49.0	188
R5-adults 40-60 y/o	21.9	84
R6-adults >65 y/o	2.1	8
Q11—In your clinical practice, which gender experience bruxism the most?		
R1-men	25.0	96
R2-women	33.3	128
R3-no differences between genders	41.7	160

(4.7%), consumption of stimulants (19.8%), and consumption of neuroleptics and antidepressants (18.7%). During the clinical examination participants usually look for dental wear (94.7%) and facial pain (90.1%).

Prevention of dental wear (52.1%), reduction of the patient's stress (60.9%), and improvement of the patient's quality of life (58.8%) are the major goals of bruxism management, as shown in

TABLE 3 Bruxism assessment (Q12–Q15).

Answer options	Response percent	Response count
Q12—What is the most frequent main complaint referred by patients with bruxism? (more than one response option possible)		
R1-dental wear/abrasion	56.8	218
R2-dental hypersensitivity	23.9	92
R3-headache	18.7	72
R4-TMJ pain and/or noise	23.4	90
R5-facial pain	59.9	230
R6-difficulty in opening the mouth	4.7	18
R7-reduction of quality of sleep and/or number of sleep hours	3.1	12
R8-failures of restorative/prosthetic treatments	13.5	52
R9-not listed	1	4
Q13—What approaches do you use to assess bruxism? (more than one response option possible)		
R1-patient's history	87.5	336
R2-questionnaires	28.1	108
R3-clinical intra-oral examination	95.3	366
R4-clinical extra-oral examination	52.6	202
R5-electromyography or polysomnography	7.8	30
R6-Ecologic Momentary Assessment or Experience Sampling Method	0.5	2
R7-not listed	2.6	10
Q14—What subject-based information do you collect during patient's interview for bruxism assessment? (more than one response option is possible)		
R1-clenching/grinding of the teeth when awake	79.7	306
R2-clenching/grinding of the teeth when asleep	90.1	346
R3-oral parafunctions (nail biting, bitten lips, etc.)	38.0	146
R4-previous orthodontic treatment	2.6	10
R5-headaches	39.6	152
R6-bruxism in family members	4.7	18
R7-stress and anxiety	69.3	266
R8-consumption of stimulants (tobacco, coffee, alcohol, drugs)	19.8	76
R9-neuroleptics and antidepressants	18.7	72
R10-sleep disorders	37.0	142
R11-problems with acidity in the mouth	6.2	24

TABLE 3 (Continued)

Answer options	Response percent	Response count
R12-masticatory muscle pain	77.6	298
R13-TMJ pain	59.9	230
R14-neck and shoulder pain	41.6	160
R15-history of failures of restorative work/prosthetic constructions	33.8	130
R16-not listed	2.1	8
Q15—What clinical clinically-based information do you collect for bruxism diagnosis? (more than one response option is possible)		
R1-dental wear or abrasion	94.7	364
R2-dental hypersensitivity	33.8	130
R3-occlusal precontact	19.8	76
R4-masticatory muscle and TMJ pain	90.1	346
R5-TMJ noise	43.7	168
R6-Static and dynamic occlusion	23.4	90
R7-fracture of restorative work/prosthetic constructions	41.7	160
R8-indentations on the tongue or lip	46.3	178
R9-linea alba on the inner cheek	38.5	148
R10-masticatory muscle hypertrophy	64.6	248
R11-not listed	3.1	12

Table 4, and occlusal splint represents the management strategy most often offered to bruxism patients. Occlusal therapies, such as occlusal adjustment and orthodontic treatment, are sometimes used by approximately 10% of the sample.

Preference on splints design and prescribed patterns, included in Table 5, showed that most of participants prefer smooth occlusal surface (81.5%) and rigid materials (82.0%), and recommend wearing the appliances (52.9%) every night, and for life (55.2%).

## 4 | DISCUSSION

The present study aimed to investigate Italian practitioners' encounters with bruxism in their clinical practices and analyse their approaches for assessing and managing bruxism.

Perceptions of bruxism prevalence within clinical practices, methods used to ascertain the presence of the behaviour, specific causes and associated health outcomes investigated, intervention criteria, goals of treatment and treatment options were queried.

The secondary aim of the study was to examine practices related to the use of occlusal splints among Italian dentists, and thus, preference on splint design and prescribed patterns were investigated.

TABLE 4 Bruxism management.

Answer options	Response percent					Response count
<b>Q16—Do you manage patients with bruxism on your own?</b>						
R1-never	0					0
R2-rarely	20.3					78
R3-sometimes	29.7					114
R4-often	35.9					138
R5-always	14.1					54
<b>Q17—Have you ever referred a patient with suspected bruxism to a different specialist? If so, to whom? (more than one response option is possible)</b>						
R1-No	29.2					112
R2-orofacial pain specialist	42.7					164
R3-ENT	4.7					18
R4-sleep medicine expert	13.5					52
R5-gastroenterologist	2.6					10
R6-speech therapist or physiotherapist	17.2					66
R7-psychologist	19.3					74
R8-general practitioner	0.5					2
R9-neurologist	6.2					24
R10-not listed	1					4
	<b>R1-not at all</b>	<b>R2-not much</b>	<b>R3-quite a lot</b>	<b>R4-very much</b>	<b>R5-I do not know</b>	
<b>Q18—How significant do you think these goals are in the clinical management of bruxism...?</b>						
To prevent dental wear	0% (n=0)	5.2% (n=20)	42.2% (n=162)	52.1% (n=200)	0.5% (n=2)	
To improve dental aesthetics and function	6.8% (n=26)	33.3% (n=128)	36.5% (n=140)	22.4% (n=86)	1% (n=4)	
To reduce stress and emotional baggage	0.5% (n=2)	6.8% (n=26)	30.2% (n=116)	60.9% (n=234)	1.6% (n=6)	
To reduce the activity of jaw muscles	2.6% (n=10)	20.8% (n=80)	39.6% (n=152)	33.8% (n=130)	3.1% (n=12)	
To relieve muscle/joint pain	0.5% (n=2)	7.8% (n=30)	38.5% (n=148)	50% (n=192)	3.1% (n=12)	
To increase mouth opening	5.7% (n=22)	25.5% (n=98)	34.9% (n=134)	31.8% (n=122)	2.1% (n=8)	
To improve the quality of life	0.5% (n=2)	3.1% (n=12)	28.6% (n=110)	58.8% (n=226)	8.8% (n=34)	
	<b>R1-never</b>	<b>R2-rarely</b>	<b>R3-sometimes</b>	<b>R4-often</b>	<b>R5-always</b>	
<b>Q19—What strategy(ies) do you use for bruxism management?</b>						
Abstain from treatment and follow up	37.5% (n=144)	34.4% (n=132)	15.6% (n=60)	10.4% (n=40)	2.1% (n=8)	
Occlusal adjustment	57.3% (n=220)	27.1% (n=104)	11.0% (n=42)	4.2% (n=16)	0.5% (n=2)	
Orthodontic treatment	45.3% (n=174)	34.9% (n=134)	10.9% (n=42)	7.8% (n=30)	1.0% (n=4)	
Occlusal splint/anterior bite splint	1.6% (n=6)	8.8% (n=34)	19.8% (n=76)	53.6% (n=206)	15.6% (n=60)	
Mandibular advancement device (MAD)	50.0% (n=192)	26.0% (n=100)	19.3% (n=74)	41.7% (n=16)	0.5% (n=2)	
Restorative/prosthetic treatment	43.7% (n=168)	23.4% (n=90)	16.7% (n=64)	15.6% (n=60)	0.5% (n=2)	
Physiotherapy	9.4% (n=36)	13.0% (n=50)	14.6% (n=56)	42.7% (n=164)	12.5% (n=78)	
Cognitive-behavioural therapy and biofeedback	45.3% (n=174)	9.9% (n=38)	10.4% (n=40)	22.9% (n=88)	11.5% (n=44)	
Drugs (i.e. muscle relaxant, antidepressant or other)	64.0% (n=246)	22.9% (n=88)	8.3% (n=32)	3.6% (n=14)	1% (n=4)	
Injection of botulinum toxin	87.5% (n=336)	8.8% (n=34)	1.6% (n=6)	1.6% (n=6)	0.5% (n=2)	
	<b>R1-never</b>	<b>R2-rarely</b>	<b>R3-sometimes</b>	<b>R4-often</b>	<b>R5-always</b>	
<b>Q20—Do you use any management strategy for bruxism not listed before?</b>						
R1-No.	93.2					358
R2-Yes	6.8					26
• TENS						
• hypnosis						
• auriculotherapy						

TABLE 5 Practices related to the use of occlusal splints (Q21–Q26).

Answer options	Response percent	Response count
Q21—When making the occlusal splint, what design do you usually use?		
R1-smooth occlusal surface	81.5	308
R2-indented occlusal surface	11.6	44
R3-mandibular advancing device	1.1	4
R4-I do not know	4.2	16
R5-not listed	1.6	6
Q22—To make the occlusal splint, what materials do you use?		
R1-flexible material	9.0	34
R2-rigid material	82.0	310
R3-flexible material for the inner face, rigid material for the outer face	5.8	22
R4-I do not know	3.2	12
R5-not listed	0	0
Q23—For which arch do you make the occlusal splint?		
R1-systematically for the maxillary arch	49.2	186
R2-systematically for the mandibular arch	10.0	38
R3-it depends on the clinical situation	38.6	146
R4-I do not know	2.1	8
Q24—How do you recommend the splint be used?		
R1-every day and every night	2.6	10
R2-every night and during the day whenever possible	38.6	146
R3-every night	52.9	200
R4-a few night per week (discontinuously)	1.6	6
R5-I do not know	1.6	6
R6-not listed	2.6	10
Q25—What duration of use do you recommend?		
R1-1 mo	0.5	2
R2-3 mo	5.8	22
R3-6 mo	25.4	96
R4-for life	55.2	212
R5-I do not know	12.2	46
Q26—How often do you check occlusal splints?		
R1-never	0.5	2
R2-every 2 weeks	5.3	20
R3-once a month	38.6	146
R4-every 3 mo	27.0	102
R5-every 6 mo	6.3	24
R6-I do not know	7.9	30
R7-not listed	7.9	30

#### 4.1 | Encounters with bruxism in clinical practices of Italian dentists

The answers obtained revealed that Italian practitioners commonly (10%-30%) encounter bruxism in their practices, both as conscious or unaware behaviour, mainly affecting the adult population between 25 and 40 years old, with no gender differences (Table 2). Consistently, epidemiological studies assessed the prevalence ranges of bruxism in adults between 8% and 31%, decreasing with age,<sup>20</sup> with no notable difference between males and females.<sup>21</sup> Instead, while the present survey participants rarely reported bruxism in individuals under the age of 18, a high prevalence of this behaviour in children (13% to 49%)<sup>22</sup> and adolescents ( $\approx 22.2\%$ )<sup>23</sup> has been assessed in literature. This inconsistency may be explained by the lack of knowledge about bruxism that is generally found among parents or guardians of minors. If properly informed, parents and guardians may easily perceive the characteristic sounds that accompany nocturnal teeth grinding, identify the problem, and report it to a dentist or other healthcare professional. In recent years, numerous studies have been carried out to evaluate the knowledge of parents and guardians about bruxism in children and adolescents, and they all confirmed the need to boost their awareness of this problem to make bruxism easier to identify.<sup>24,25</sup>

#### 4.2 | Italian practitioners' approaches for assessing bruxism

Italian practitioners' approaches for assessing bruxism are mainly non-instrumental, including personal history (87.5%), and intra- (95.3%) and extra-oral (52.6%) clinical examination (Table 3).

However, when interviewing patients to establish a diagnosis of bruxism, Italian dentists seemed not to properly investigate factors that may provoke or maintain bruxism (e.g., consumption of coffee and tobacco; drugs; oral parafunctions),<sup>26</sup> except for stress and anxiety. When these factors are not identified, bruxism cannot be properly managed with ways to correct or avoid them.<sup>12</sup>

The most relevant data revealed that problems with acidity in the mouth and sleep related disorders were assessed by only 6.2% and 37.0% of respondents, respectively, suggesting that the associations of bruxism with GERD<sup>27</sup> and sleep related disorders<sup>8</sup> were generally unknown among Italian practitioners. Consistently, respondents rarely refer patients with bruxism to specialists such as gastroenterologists, sleep physicians, or otolaryngologists. When the MMA is linked to GERD or sleep disorders, it tends to improve when these conditions are properly managed, but if they are not underlined, an appropriate management protocol cannot be implemented.<sup>28</sup>

Finally, only 4.7% of practitioners ask patients about the presence of bruxism in family members (Table 3), suggesting there is a lack of awareness about the potential role of the genetic background in the development or persistence of bruxism.<sup>29</sup>

Furthermore, most respondents assess bruxism by checking objective signs, notably tooth wear or abrasion (94.7%; Table 3).

However, any oral feature is neither sensitive nor specific for bruxism since repetitive MMA is not inevitably associated clinical sequelae and the same features may be related to other conditions.<sup>30,31</sup>

### 4.3 | Italian practitioners' approaches for managing bruxism

Based on the results of the survey, Italian practitioners treat patients with bruxism themselves within their practices or refer them to dentists who are experienced in orofacial pain and temporomandibular disorders (Table 4).

Interestingly, the choice of doing nothing seemed to be a rare treatment option among respondents (Table 4), despite, according to the current concept of bruxism, treatment should only be considered when negative consequences outweigh positive outcomes.<sup>15</sup>

The survey replies suggest that performing occlusal adjustments, orthodontic treatment, and conservative/prosthetic restoration are still common in clinical practice. In contrast, the literature does not recommend irreversible occlusal changes to manage bruxism<sup>12,14</sup> since the role of peripheral factors (i.e., occlusal imbalance) in the aetiology of bruxism has been downsized and the alleged cause and effect relationship between bruxism and occlusion has been refuted.<sup>9</sup>

Although about 70% of respondents recognized the role of psychological factors as etiological elements of bruxism and find it very important to reduce the stress and emotional baggage of patients, improving the quality of their lives, cognitive behavioural therapy seemed to be of little use to Italian dentists. Similarly, only 19.3% of practitioners suggested patient psychiatric/psychological counselling, which provides patients with specialized support for the management of psychological disorders and personality traits associated with bruxism.<sup>32</sup>

Physiotherapy for jaw muscles is commonly recommended by Italian practitioners. Simple and quick exercises aimed at resolving the muscle hypertonus present have been described in literature to help patients manage bruxism.<sup>33</sup>

Respondents rarely prescribed pharmacological therapy to manage bruxism. Consistently, from the literature, it emerges that a pharmacological approach may be indicated only in severe cases of bruxism, when it is associated with TMJ disorders or when other treatment solutions have failed.<sup>15,34</sup>

Interestingly, 6.2% ( $n=24$ ) of respondents have referred patients with bruxism to a neurologist. Although in most persons bruxism is not a disorder, MMA is a sign of a disorder (e.g., epilepsy, dystonia) in some.<sup>2</sup>

### 4.4 | Practices related to the use of occlusal splints

Occlusal splints seemed to be the most frequent treatment option Italian practitioners offered their patients with bruxism (Table 4). The reason why dentists widely recommend occlusal appliances is simple

to understand considering that one of the objectives in the management of patients with bruxism to which most dentists attached great importance was the prevention and limitation of dental wear. Indeed, although there are few randomized controlled trials on the efficacy of occlusal devices in reducing muscle hyperactivity (and their results are conflicting), the usefulness in the prevention or limitation of the associated clinical correlates has been clearly established.<sup>35</sup>

Most dentists use a splint with a smooth occlusal surface (81.5%), consisting of rigid material (82.0%) and constructed systematically for the upper arch (49.2%; Table 5). However, a recent systematic literature review showed that virtually all types of occlusal devices had positive results in reducing motor hyperactivity during sleep, at least in the short term.<sup>36</sup> This may be related to the "novelty effect" introduced by these appliances: the reduction in MMA would be caused by the transient need to reorganize the recruitment of motor units. This hypothesis was also supported by the observation that intermittent use of the devices is more effective than their continuous use.<sup>37</sup> Instead, dentists participating in the survey reported that they generally recommend using the devices continuously, every night (52.9%) or even during the day whenever possible (38.6%; Table 5). The use of the appliances during the day is never recommended, since patients should be instructed to become aware of and control their MMA.<sup>36</sup> Moreover, devices designed to provide mandibular advancement seemed to have greater effectiveness in reducing bruxism.<sup>38</sup> This can be explained by a reduction in the contractile property of the masseter when the mandible is brought forward<sup>28</sup> or by increased breathing space if bruxism is associated with OSA. The survey conducted showed that the use of these devices (MAD) was still not widespread. This is probably related to the complications that these appliances can bring, such as discomfort or pain, or the side effects on skeletal growth and occlusion.<sup>39</sup>

Finally, according to this survey, almost all dentists followed the evolution of the patient's motor behaviour over time and monitored the occlusal appliances. This is critical, since without follow-up the effects of occlusal devices have been reported to diminish over time.<sup>40</sup>

The results of the present study should be considered valid within the following limits. First, it is a survey-based study, and respondents may have improperly interpreted such specific questions. However, it may be conceivable that self-administration of questionnaires enables more authentic answers, truly representing the respondent's beliefs. Second, a potential selection bias of participant should be taken into account, since the questionnaire was disseminated through a Facebook dental network group, where only certain dentist are active, and people who are not dentists could be added since no strict control over users' subscriptions is provided.

Future studies should also investigate the relation between sociodemographic data (e.g., age, last degree obtained, disciplines), and diagnostic and treatment strategies used, since dental schools should have discouraged irreversible approaches over the years, and certain professional or academic experience could have provided more knowledge on the subject.

## 5 | CONCLUSION

The present survey-based study revealed that Italian practitioners commonly encounter bruxism in their practices, taking a wide variety of approaches to assess and manage this condition. The findings were consistent with the emerging need for study aimed at identifying a standardized protocol to assess and manage bruxism in dental practices. Moreover, inconsistencies between clinical practices and scientific evidence highlighted the need for better education of dental practitioners and for wider dissemination of the knowledge on which the current concept of bruxism is based.

### AUTHOR CONTRIBUTIONS

D.C. performed the study and wrote the manuscript. F.G. participated in the interpretation of the results. M.G. and M.L.B. contributed to the data acquisition and analysis. R.B. made contribution in the design of the study and revised the manuscript. S.M. coordinated the research project and revised the manuscript. All authors read and approved the final manuscript.

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### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### ORCID

Stefano Martina  <https://orcid.org/0000-0003-3877-1671>

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