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SWISS DENTAL JOURNAL SSO 133:
80–87 (2023)
Accepted for publication:
10 October 2022

Self-reported injuries to oral tissues through resistance training in bodybuilders

KEYWORDS

Mouth-teeth-jaw problems
Resistance training
Athletes
Bodybuilding
Mouthguard

SUMMARY

Lifting heavy weights almost automatically elicits teeth clenching, which, if performed regularly, may lead to chronic trauma. This study assessed self-reported injuries to oral tissues in athletes and bodybuilders caused by resistance training and determined the association between self-reported trauma, performance level, and the duration of practicing resistance training. A standardized questionnaire was used to gather information about the respondents (age and gender), their performance level (hobby versus competition athlete), experience with oral tissue trauma, the use of mouthguards, and dietary habits. From a total of 363 females and 239 males, 221 (36.7%) classified themselves as competition athletes and 381 (63.3%) as hobby athletes.

33.6% (n = 202) of the participants declared distress in their orofacial region during practice. Female hobby athletes reported 2.5 times more mouth-teeth-jaw problems than female competition athletes ($p < 0.001$). Females showed themselves slightly more susceptible to mouth-teeth-jaw problems with resistance training than males (odds ratio [OR] = 1.45, $p = 0.076$). Negative oral effects were found to be 2.1 ($p = 0.003$) times higher for those who had been practicing for 10 years or more. It was concluded that a higher number of years of resistance training increased self-reported oral tissue trauma in the current cohort. Females were more likely to report orofacial problems than males.

Introduction

With the recent emergence of social media, there has been a trend of “fitspiration” originating from fitness influencers – a trend offered by the internet to inspire people to achieve an empowered body image through resistance training (RT) and healthy eating (TIGGEMANN & ZACCARDO 2015). Some of those influencers have gathered huge communities, spreading their images of perfectly tuned fit bodies and influencing young people to strive for the same (RODGERS ET AL. 2020). Sociocultural theories had highlighted how exposure to image-focused media content could be associated with higher levels of internalization of appearance ideals as a personal standard to strive for (SCHAEFER ET AL. 2015).

The bodybuilding associations recognize this trend of fitness and symmetry in muscle composure by adding entry-level classes, such as Bikini Fitness, Women’s Wellness, Men’s Physique, and Men’s Muscular Physique, to their reformation of classical bodybuilding. The German federation, for example, last amended its categories in 2017 (DBFV 2021), thereby making the sport more accessible to the population interested in working out and gaining more popularity. This leads to an increase in participants in all categories.

“Bodybuilding is the practice of performing regular exercises designed to make the muscles of the body conspicuous” (COLLINS DICTIONARY.COM 2022). Following this definition, bodybuilding includes not only sport organized by associations but also sport practiced by hobby athletes, usually in the gym. Both groups use weightlifting in the form of RT, a common method of practicing their sport.

Among the causes for the development of tooth wear, tooth clenching elicited during the practice of physical exercises, such as RT, or bodybuilding can occur (YAMANAKA ET AL. 2000). HUANG ET AL. (2014) even reported that weightlifters and professional as well as amateur bodybuilders exerted constant forces on their jaws and teeth during their physical activities, especially during maximal contraction. Using all strengths to overcome the weights, the teeth are almost automatically clenched, and the face shows signs of maximal strain (Fig. 1). This clenching is an unconscious act exacerbated by efforts that involve muscle contraction forces (BUDD & EGEA 2017). Repetitive strains led to stretching and shearing forces on the tooth neck. The damaged hydroxyapatite crystal connections develop cracks in the tooth enamel and, finally, lead to tooth material loss. An excessive occlusal load, such as clenching, may contribute to this phenomenon (REES 2002).

Studies have been developed to define the causes for the emergence of attrition, abfraction, erosion, and abrasion of teeth. These dental wear lesions have multifactorial causes, and several etiological factors had been attributed to their formation (LYONS 2001; BARTLETT & SHAH 2006; GRIPPO ET AL. 2004; LÓPEZ-FRÍAS ET AL. 2012). In the study by GALVAO & DE BONIS (2018), the authors observed performance impairment of up to 19% in athletes. Among the most common and relevant dental factors that could cause performance impairment in athletes were teeth clenching and temporomandibular joint pain (FRIEDMAN RUBIN ET AL. 2019).

Besides the natural aging of the teeth, other etiological factors included dietary habits, use of illegal substances, and consumption of isotonic fluids. These habits were prevalent during the athletes’ activities (BUDD & EGEA 2017). This could be considered potentially erosive to dental tissues if inappropriately and frequently consumed (LUSSI ET AL. 2004; HINDS 2019).

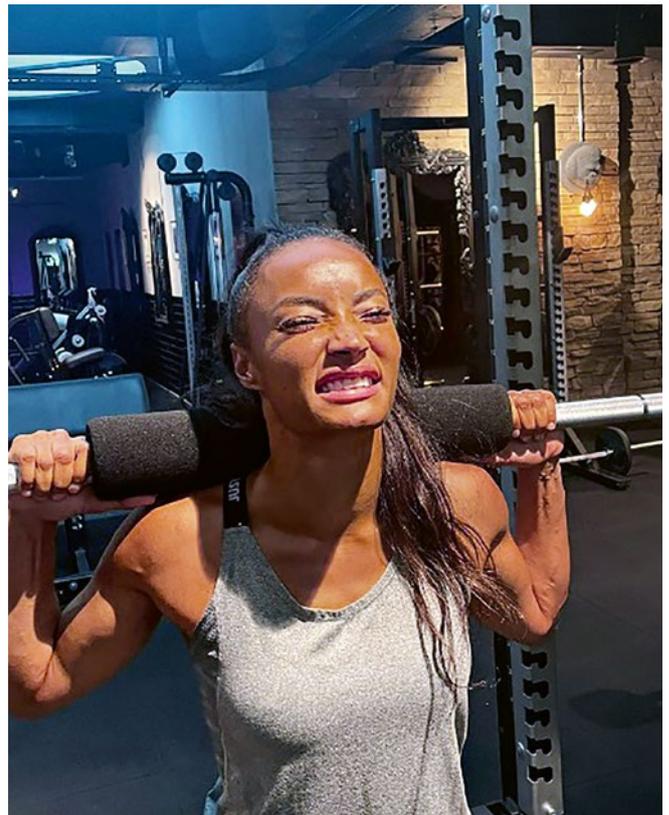


Fig. 1 Face of effort – a person is lifting heavy weights.

Although weightlifting, especially in the form of RT, is a widely practiced physical activity, the relation of this sport to dental wear that may affect its practitioners had merely been researched in the past, as DE BESSA ET AL. (2021) noticed. She examined 260 weightlifters from five gyms in the municipality of Caicó (Brazil) and observed that weightlifting practitioners had hardly any knowledge about dental wear, and attrition and abfraction of the teeth were unknown to a large extent.

According to DE BESSA ET AL. (2021), a significant correlation between having abfraction and going to the gym up to four times a week was noticed. However, 91.9% of weightlifting practitioners had no knowledge about dental wear. Among them, 97.7% did not know about attrition and abfraction and 95.8% were not aware of erosion and abfraction (DE BESSA ET AL. 2021).

Based on the findings of the study by DE BESSA ET AL. (2021), this study aimed to assess whether prolonged (heavy) weightlifting by the athletes in the form of RT led to a self-reported increase in changes in the orofacial region, such as oral tissue trauma. Furthermore, it was investigated whether factors such as age, gender, or the type or duration of RT influenced this outcome. Competition and hobby athletes practicing RT in Switzerland and Germany were assessed using a standardized questionnaire.

Materials and Methods

Due to the restrictions by the coronavirus-2019 (COVID-19) pandemic, a physical meeting with study participants was not advisable. Instead, an anonymous questionnaire was processed online to gather data from the participants on whether hobby and competition athletes experienced oral tissue trauma. In order to approach the participants, a brief introduction letter

describing the project was set up prior to the questionnaire, also asking for consent of the participants. The Ethics Commission of North-West and Central Switzerland (EKNZ) approved that the project did not infringe the laws of the Human Research Act.

The compiled questionnaire, where single- or multiple-choice responses were possible, contained up to 34 items regarding the training with heavy weights. The information evaluated included six parts:

1. Characterization of the study population (age, gender, and hobby or competition athlete).
2. Questions capturing the duration/frequency of RT (how many years, days per week, and hours per day).
3. Questions focusing on the type of dental injury during RT, if applicable.
4. Questions about pain perceptions during and after RT (in the muscles of the face, jaw, neck, and shoulders).
5. Questions exploring dietary habits (consumption of supplements, hormones, diuretics, and illegal drugs: when and how often).
6. Questions regarding the use of a mouthguard (for sport, at night, or being recommended by a specialist).

The questionnaire was uploaded to LamaPoll.de in both German and English. The website provided a link and a QR code leading directly to the questionnaire. The link was published on social media (Instagram and Facebook) as well. The questionnaire was online for more than two months (25.4.2021–30.6.2021).

Swiss, German (SBFV, SNBF with approximately 150 competition athletes per year, and DBFV with approximately 1,800 competition athletes per year) and international bodybuilding federations (IFBB), supporting the project, uploaded the link and QR code to their newsletters and published them on dashboards of two IFBB competition events during the registration process of the athletes (German Cup on June 5, 2021, with 265 participants and Diamond Cup on June 12, 2021, with 215 participants).

After collecting data, the items were evaluated in three categories: gender, competition vs hobby athletes, and the duration (years) of RT practice. These three categories were then compared to each other and regression tests were conducted.

Statistical Methods

Categorical variables were described by specifying the number and percentage in each group with the corresponding p -value derived from the χ^2 tests.

Logistic regression analysis with a binomial data structure was performed to predict the occurrence of teeth injuries (yes vs no) between the three groups as defined above. The regression models were evaluated in advance for potential noteworthy interactions between gender and the given groups. In the absence of significant interactions, the models were correspondingly adjusted for gender and years of RT (instead of age). The resulting estimates represented adjusted odds ratios (OR) with a 95% confidence interval (CI) and p -values. A p -value <0.05 was considered significant (two-sided). All analyses were performed with the statistical program R version 3.5.1 (R CORE TEAM 2018).

Results

Descriptive analyses

All data presented in this study is based on the participants' own account and has not been clinically tested. From 722 peo-

ple who responded to at least the first question in the questionnaire, 602 answered questionnaires were included in the results. The exclusion criterion was dropping out before the third part of the questionnaire (please refer to the list in section "Materials and Methods").

Out of 363 females (60.3%; median age, 27 years [14–67]: interquartile range [IQR] 23) and 239 males (39.7%; median age, 31 years [16–74]: IQR 27), 221 (36.7%) classified themselves as competition athletes (having taken part in a bodybuilding competition; 107 females or 29.5% and 114 males or 47.7%) and 381 as hobby athletes (256 females or 70.5% and 125 males or 52.3%).

Among the competition athletes, 125 (56.6%) competed once or twice per year and 96 (43.4%) competed more than thrice per year. No gender-specific difference was found ($p=0.78$). Most participants (435 or 72.4%) practiced 4 to 6 times per week and up to 2 hours (531 or 88.4%). Among the 602 participants, 33.6% ($n=202$) proclaimed distress in their orofacial region. Females were more likely to feel discomfort in their jaw (87 females or 68% vs 34 males or 45.9%, OR = 2.71, $p=0.007$), whereas male participants described injuries to their teeth (36 females or 28.1% vs 36 males or 48.6%, OR = 0.72, $p=0.36$).

Hobby vs competition athletes

Comparing hobby athletes with competition athletes, 95.2% of competition athletes stated using dietary supplements; 76.4% of hobby athletes supplemented their diet to enhance their performance; 82.7% of competition athletes used supplements throughout the year compared with 65% of hobby athletes (Tab. I). The reported supplement intake was 5.48 times higher among competition athletes than among hobby athletes and increased after >10 years of RT compared with athletes having worked out <5 years (OR = 1.14, $p=0.722$). In the groups of <5 , 6–10, and >10 years of RT, hormone intake was 7.8%, 14%, and 27.1%, respectively. The probability of hormone intake in competition athletes was 14.16 times higher and increased after >10 years of RT (OR = 1.19, $p=0.656$). The use of diuretics was 9.2% in the group of <5 years of RT, rose up to 18.3% in the second group, and was the highest at 33.3% in the third group. Diuretic intake was more than doubled after >10 years of RT (OR = 2.41, $p=0.017$). Illegal substance intakes were admitted by 5.8%, 10.7%, and 21.1% participants in the first, second, and third group, respectively. In terms of overall intake, the questionnaire revealed that 33.3% of bodybuilding competition athletes used hormones (OR = 14.16, $p<0.001$), 44% took diuretics (OR = 30.92, $p<0.001$), and 23.4% consumed illegal substances (OR = 10.14, $p<0.001$; Tab. II and III), whereas 3.1% of hobby athletes reported taking hormones, 2.2% diuretics, and 2.5% illegal substances (Tab. I). Females, however, depicted a clear tendency of not following these trends for hormone intake (OR = 0.13, $p<0.001$), diuretics use (OR = 0.48, $p=0.014$), or illegal substance use (OR = 0.26, $p=0.001$).

Duration of training

According to the years of RT, the participants were categorized into three groups as follows: 258 (43%) participants indicated that they had <5 years of RT, 188 (31.3%) had 6–10 years of RT, and 154 (25.7%) underwent >10 years of RT. 207 females (57.3%) were in the group of <5 years of RT and 118 males (49.4%) signed into the group of >10 years of RT. In the groups of <5 , 6–10, and >10 years of RT, oral tissue trauma during RT was

Tab. I Self-reported adjustments in hobby athletes compared with competition athletes

	Hobby athletes n = 381	Competition athletes n = 221	p-value (χ^2 test)
Dietary supplements intake: yes vs no	76.4% (n = 243)	95.2% (n = 197)	<0.001
Dietary supplements: throughout the year vs occasionally	65% (n = 158)	82.7% (n = 163)	<0.001
Hormone intake: yes vs no	3.1% (n = 10)	33.3% (n = 69)	<0.001
Diuretics intake: yes vs no	2.2% (n = 7)	44% (n = 91)	<0.001
Illegal substances intake: yes vs no	2.5% (n = 6)	23.4% (n = 46)	<0.001
Mouthguard at night: yes vs no	24.6% (n = 77)	15.7% (n = 32)	0.020
Mouthguard during training: yes vs no	3.2% (n = 10)	6.4% (n = 13)	0.14

Tab. II Self-reported parameters of athletes in correlation to years of resistance training (RT)

	<5 years RT Group 1 n = 258	6–10 years RT Group 2 n = 188	>10 years RT Group 3 n = 154	p-value (χ^2 test)
Effects on mouth-teeth-jaw	30.4% (n = 76)	36.6% (n = 67)	39.3% (n = 59)	0.15
– Effects on jaw	68.4% (n = 52)	52.2% (n = 35)	57.6% (n = 34)	0.13
– Tooth damage	26.3% (n = 20)	29.9% (n = 20)	54.2% (n = 32)	0.002
Hormone intake	7.8% (n = 17)	14% (n = 23)	27.1% (n = 39)	<0.001
Diuretics intake	9.2% (n = 20)	18.3% (n = 30)	33.3% (n = 48)	<0.001
Illegal substances	5.8% (n = 10)	10.7% (n = 15)	21.1% (n = 27)	<0.001
Mouthguard recommended	8.1% (n = 17)	11.6% (n = 19)	25.2% (n = 36)	<0.001

Tab. III Comparison of self-reported outcome of competition vs hobby athletes by logistic regression models adjusted for gender and years of resistance training (RT)

Parameter	Comparison competition vs hobby athletes		
	Crude OR (95% CI)	Adj. OR (95% CI)	P-value (Wald's test)
Effect on mouth-teeth-jaw: yes vs no	0.64 (0.44, 0.92)	0.58 (0.4, 0.85)	0.005
Jaw problems: yes vs no	0.38 (0.2, 0.7)	0.45 (0.23, 0.88)	0.020
Tooth damage: yes vs no	2.67 (1.44, 4.95)	2.04 (1.05, 3.98)	0.036
Oral tissue damage: yes vs no	1.13 (0.58, 2.19)	1.12 (0.55, 2.29)	0.76
Head-neck-shoulder damage: yes vs no	0.72 (0.51, 1.02)	0.71 (0.5, 1.01)	0.057
Training pause: yes vs no	0.7 (0.42, 1.16)	0.61 (0.36, 1.03)	0.062
Supplement use: yes vs no	6.08 (3.06, 12.07)	5.48 (2.74, 10.99)	<0.001
Hormone intake: yes vs no	15.4 (7.7, 30.79)	14.16 (6.89, 29.09)	<0.001
Diuretics intake: yes vs no	34.85 (15.7, 77.39)	30.92 (13.8, 69.29)	<0.001
Supplement intake throughout or intermitted	0.39 (0.25, 0.61)	0.41 (0.26, 0.65)	<0.001
Illegal supplement intake: yes vs no	12.03 (5.02, 28.86)	10.15 (4.17, 24.7)	<0.001
Mouthguard during training: yes vs no	2.06 (0.89, 4.8)	1.83 (0.77, 4.37)	0.17
Night guard: yes vs no	0.57 (0.36, 0.9)	0.63 (0.39, 1.02)	0.060
Male: effect of mouth-teeth-jaw: yes vs no	0.97 (0.56, 1.69)	0.91 (0.52, 1.59)	0.73
Female: effect of mouth-teeth-jaw: yes vs no	0.47 (0.28, 0.78)	0.41 (0.24, 0.68)	<0.001

reported by 26.3%, 29.9%, and 54.2% of participants, respectively (OR = 2.2, $p = 0.056$) (Tab. II and III).

The data revealed an effect of the duration of training, indicating that with the increased number of years of training, an increase in training days per week and hours per day could be observed. This effect was associated with the tendency of increase of several self-reported parameters, such as oral tissue trauma or hormone intake per training year (Tab. II).

Competition athletes stated a 2.0 times higher probability of experiencing oral tissue trauma, whereas females reported a slightly lower frequency of oral tissue trauma than males. After >10 years of RT, the self-reported rate of oral tissue trauma was 2.2 times higher (Tab. III).

Influence of gender, RT, and ambition on teeth

All logistic regression predictions are displayed in Table III. Logistic regression predicting outcome on mouth-teeth-jaw problems showed a gender-specific outstanding difference (CI 95%). In comparison with years of RT, female competition athletes reported 2.5 times fewer negative effects on mouth-teeth-jaw problems than female hobby athletes ($p < 0.001$; Tab. III). Males did not experience major differences in problems in this category neither as hobby nor as competition athletes. In general, the self-reported probability of having negative effects in the mouth-teeth-jaw region was 2.1 times higher in those who practiced >10 years of RT than in those who had been doing <5 years of RT ($p = 0.002$; Tab. III). Females illustrated a trend toward more negative effects compared to males (OR = 1.45, $p = 0.076$).

The predictions considering the self-reported jaw problems showed that females were more vulnerable than males.

No gender-specific differences were found in self-reported injuries of lips, tongue, vestibule ($p = 0.62$) or head, neck, and shoulders ($p = 0.57$). The tendencies to consult a medical doctor were not significant in any group. Male athletes, however, preferred to pause their training due to their injuries (60 females or 32.8% vs 52 males or 46.8%) and displayed lower limitations for taking hormones (15 females or 4.8% vs 64 males or 30.2%; OR = 0.13, $p < 0.001$), diuretics (35 females or 11.2% vs 63 males or 29.7%; OR = 0.48, $p = 0.014$), or illegal substances (12 females or 4.8% vs 40 males or 21.1%; OR = 0.26, $p < 0.001$).

Mouthguard

24.6% of the hobby athletes wore a mouthguard during the night compared to 15.7% of the competition athletes. Females were more likely to wear a mouthguard during the night (85 females or 27.6% vs 24 male or 11.5%, OR = 3.3, $p < 0.001$) while there was no gender-specific difference in wearing a mouthguard during training (OR = 0.95, $p = 0.915$) or having a mouthguard recommended by a dentist. However, competition athletes showed 1.83 times higher tendency to wear a mouthguard during training and the rate increased by 2.02 times for those who had practiced >10 years of RT.

The dentist recommended wearing a mouthguard to 8.1% of the athletes in the first group, 11.6% in the second group, and 25.2% in the third group with >10 years of RT (Tab. II).

Discussion

Like any other physical exercise practice, weight training has its risks when practiced incorrectly since people may sustain injuries, be it a bone, muscle, ligament, or tendon injury (FRIEDMAN

RUBIN ET AL. 2019; SOARES & DA SILVA 2018), or, as this paper constitutes, orofacial tissues.

Resistance, strength, and power training, especially aiming at bodybuilding, were largely performed by males previously. With the influence of social media and the newer less intimidating categories in bodybuilding, the sport has become more popular, especially among females. In the current study, 60% of the respondents were females. This underlines the relationship between social media use, body image, and muscle-building outcomes with the inclusion of “muscularity behaviors” as an outcome of interest for adolescent girls (RODGERS ET AL. 2020), further pointing toward the tendency of the Women’s Bikini and Women’s Wellness categories gaining more popularity as beginner levels. These more accessible levels make it easier for females to identify themselves with bodybuilding in a competitive form and find RT for females, in general, more appealing. This result may be associated with the younger average age of the females in this study (27 years as compared to 31 years of the males). This could also explain why most of the females only trained up to five years and competed in the Women’s Bikini class. It is the entry class for female bodybuilding that requires the least building of muscle mass through RT since it is not assessed in this category.

The results seem to demonstrate that females suffered a bigger tendency to self-reported mouth-teeth-jaw problems in correlation to years of RT. The fact that there was a significant difference between female competition and female hobby athletes might be because most competition athletes were new to the sport with only <5 years of RT.

Because of the higher impact during RT with heavy weights, one may assume that males would report more damage than females contrary to indications above. The responses of the presented questionnaire indicated a trend toward females being more affected. It is likely that females report damage that has to be classified as “normal” physiological changes. On the other hand, it is also possible that males do not report certain tooth damage because they do not recognize or classify these damages since the judgment of the participants was liable to their own subjective perceptions and not to clinical trials.

The study result by DE BESSA ET AL. (2021), which attributed attrition and abfraction more to females, suggested that some triggering factors of the lesions, such as stress, anxiety, and hormonal factors, might be more related to females. This could lead to changes in diet, development of habits, and lack of care with dental elements. The results of DE BESSA ET AL. (2021) would underline the subjective perceptions of the female athletes as proposed in this study.

Furthermore, female hobby athletes had a 2.5 times higher tendency of suffering from self-reported mouth-teeth-jaw problems than female competition athletes. More scientific examinations should analyze which specific stressors led to the result in this study. One assumption could be that female competition athletes have better body awareness and, therefore, enhanced sensitization to better mouth hygiene compared with female hobby athletes.

The risk-taking likelihood of males displayed itself in lower limitations for taking hormones, diuretics, or illegal substances (BUDD & EGEA 2017). All these behavioral patterns seem to support the hypothesis that athletes, in general, had a higher tendency of being seriously affected by mouth-teeth-jaw problems due to multifactorial reasons, such as dietary adjustments, teeth clenching, hormones, saliva reduction, and stress (BUDD & EGEA

2017; ARAL ET AL. 2017). The biggest group of females (68%) described problems in their jaw region. This would also underline the thesis of stress as an important factor, whereas male participants' biggest group (48.6%) mentioned specific injuries to their teeth. Clenching forces exerted during RT can potentially affect the temporomandibular joint, especially the articular disk, and cause its anterior displacement, as FRIEDMAN RUBIN ET AL. (2019) and SANTOS ET AL. (2009) formulated.

According to their own account, most participants worked out 4 to 6 times per week, up to 2 hours, for only <5 years. After >10 years of RT, a 2.1 times higher risk in mouth-teeth-jaw problems became evident. This may underline the thesis that years of training had a major impact on dental wear, in addition to the physiological wear, which occurs naturally over time.

SOARES & DA SILVA (2018) reported the occurrence of injury in the body from weight training exercises among practitioners who went to the gym 4 to 5 times a week. This study presented similar results: self-reported mouth-teeth-jaw problems were more prevalent to those who went to the gym more than 4 days a week. This was in perfect alignment with DE BESSA ET AL. (2021), who stated that among bodybuilding athletes the time of practice and the frequency of training in the gym could directly interfere with the performance of the bodybuilding exercises, correlating to the appearance of dental wear as well as body injuries.

In addition, De Bessa concluded that a significant number of participants had little knowledge about their dental problems (DE BESSA ET AL. 2021). Some reasons may be suggestive of this lack of knowledge, such as poor communication between a dentist and their patient. The study of RIBEIRO ET AL. (2019) highlighted this aspect by observing that dentists, despite showing knowledge about the treatment of these abrasions, showed more divergent results regarding the diagnosis of lesions. Hence, the difficulty in diagnosis presented by professionals may reflect the absence of dialog with the patient about dental wear.

LUSI (2006) emphasized that due to the high frequency of dental wear, a greater knowledge of the etiologies is necessary for an adequate diagnosis and prevention. Further studies should be conducted to investigate these relationships in RT athletes.

Based on these premises, the importance of dentistry in the daily practice of sports is evident. Practicing sports in clubs, gyms, and schools aims to contribute to the oral health of athletes and exercisers altogether (PASTORE ET AL. 2017) since the oral cavity may be susceptible to injuries resulting from habits in these groups.

The short supply of studies on the present topic stands out, making it difficult to compare studies with similar methodologies. The non-inclusion of other etiologic factors to verify the presence of dental wear in bodybuilding athletes was a limiting factor. Since tooth wear presents multifactorial causes, more studies should be carried out to clarify other etiological factors involved in the appearance of these lesions in bodybuilding athletes.

Due to the COVID-19 pandemic, clinical testing of dental trauma by athletes was not possible. Therefore, the study relied on the self-evaluation of bodybuilding athletes as far as wear and tear of the teeth was concerned.

Given the widespread diffusion of the questionnaire across the different platforms that are often frequented by the relevant population of the study, and the respondents' age range of

14 to 74 years, the sample of the said population may be considered quite representative.

Finally, the self-perceived nature of the gathered data posed a limitation, requiring further investigation with a less subjective approach.

Considering these aspects, a more specific interrogation of the patient by the dentist should be advised. Half-yearly to yearly checkups and treatment by the dental hygienists and a mouthguard supply during workout sessions should be obligatory.

Having outlined the results of the study and returning to the main thesis, whether prolonged RT leads to noticeable permanent effects on the orofacial region, such as oral tissue trauma, the study thesis can be confirmed. Furthermore, it can be concluded that the number of years practicing RT is an important factor for the appearance of mouth-teeth-jaw problems, and females are more vulnerable to self-reported orofacial problems than males.

Additionally, it can be assumed that the knowledge of bodybuilding athletes about such wear and tear is most likely marginal, which may imply a deficiency in prevention, making them susceptible to the development of the lesions. A dentist, in a multidisciplinary team together with the physical educator and others, can improve the performance of RT athletes through the implementation of educational and preventive measures, such as supplying the athlete with a mouthguard. The relationship between dentistry and sports practices has been underrated so far and needs to be implemented increasingly into the daily practice of dentists, for example, by asking specific questions during the history taking.

Acknowledgements

The authors wish to thank the bodybuilding associations and the participating bodybuilders for their contribution to the survey. A special thank goes to Dr. Urs Simmen for helping in handling the statistical part.

Conflict of Interest

The authors confirm that no conflict of interest is associated with this study and that the survey did not receive any financial support.

Authorship

The first author, Nira Mählmann, collected the data, contributed to the analysis and wrote the paper. Dr. Urs Simmen computed the statistical part and helped in editing it. Prof. Dr. A. Filippi monitored the whole process.

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Data Sharing and Data Accessibility

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

Zusammenfassung

Einleitung

Krafttraining und Bodybuilding sind Sportarten, die bei jungen Menschen, die durch bildbehaftete Inhalte auf sozialen Medien einem gewissen Körper- und Fitnesskult folgen, immer beliebter werden. Das Modellieren des eigenen Körpers nach den gewünschten Vorstellungen wird hierbei mit Krafttraining (im Sinne von Gewichtheben) erreicht. Das Heben schwerer Gewichte löst fast reflexartig ein Zusammenpressen der Zähne aus.

Dieses – oft unbewusste – Pressen kann die Zähne und umliegende Strukturen beschädigen und zu einem akuten (Frakturen) oder chronischen (Attritionen) Trauma führen. In dieser Studie wurden die von Sportlern und Bodybuildern selbstberichteten Verletzungen des oralen Gewebes durch Krafttraining erfasst und der Zusammenhang zwischen dem selbstberichteten Trauma, dem Leistungsniveau und der Dauer des Krafttrainings ermittelt.

Materialien und Methoden

Die entsprechenden Daten wurden mithilfe eines standardisierten Fragebogens erhoben, der von mehreren Bodybuilding-Verbänden an ihre Mitglieder verteilt wurde. Ziel war es, Informationen über die Bodybuilder (Alter/Geschlecht), ihr Leistungsniveau (Hobby-/Wettkampfsportler), Erfahrungen mit Verletzungen im orofazialen Bereich, die Verwendung eines Zahnschutzes und Angaben zu den Ernährungsgewohnheiten (Nahrungsergänzungsmittel, Hormone, Diuretika, illegale Substanzen) zu sammeln und auszuwerten.

Ergebnisse

Insgesamt konnten 602 ausgefüllte Fragebögen in die Studie einbezogen werden. 363 Frauen (60,3%, Medianalter 27, IQR 23,33) und 239 Männer (39,7%, Medianalter 31, IQR 27,38) nahmen teil. 221 (36,7%) bezeichneten sich als Wettkampfsportler (107 Frauen: 29,5%, 114 Männer: 47,7%) und 381 (63,3%) als Hobbyathlet (256 Frauen: 70,5%, 125 Männer: 52,3%).

33,6% (n = 202) der Teilnehmenden deklarierten Beschwerden im orofazialen Bereich während des Trainings. Von diesen berichteten 87 Frauen (68%) und 34 Männer (45,9%) über Probleme im Kiefergelenk sowie 36 Frauen (28,1%) und 36 Männer (48,6%) über Verletzungen an den Zähnen (Chippings, Frakturen, Zahnverlust usw.). Hobbyathletinnen gaben an, 2,5-mal häufiger von Zahn-Mund-Kiefer-Problemen betroffen zu sein als Wettkampfsportlerinnen (OR = 0,41, p < 0,001). Frauen schätzten sich im Allgemeinen anfälliger ein für Zahn-Mund-Kiefer-Probleme im Zusammenhang mit Krafttraining als Männer (OR = 1,45, p = 0,076). Die selbsteingeschätzten negativen Auswirkungen auf orale Strukturen waren 2,1-mal (p = 0,003) höher bei denjenigen, die seit 10 Jahren oder länger trainierten. Negative Auswirkungen auf orale Gewebe und die Einnahme von Nahrungsergänzungsmitteln nahmen mit der Anzahl der Jahre des Krafttrainings zu.

Diskussion

Die Untersuchung zeigt, dass die Anzahl der Jahre des Krafttrainings ein wichtiger Faktor für das selbstberichtete Auftreten von Problemen oder Verletzungen im orofazialen Bereich ist. Frauen machten im Allgemeinen häufiger Schilderungen von orofazialen Problemen im Zusammenhang mit Krafttraining. Das Bewusstsein der Athleten für trainingskorrelierte Zahnläsionen scheint gering zu sein. Das lässt eine höhere Dunkelziffer vermuten. Sowohl Zahnärzte als auch Trainer in Vereinen und Fitnessstudios sowie die Verbände sollten über die vorgestellten Zusammenhänge informiert werden, und auch die Athleten sind darüber aufzuklären. Die Anfertigung einer Sportzahnschiene wäre den Athleten sehr zu empfehlen.

Résumé

Introduction

Chez les jeunes, grâce aux réseaux sociaux et d'autres médias, la musculation et le bodybuilding deviennent de plus en plus

populaires. La musculation (dans le sens de l'haltérophilie) permet de modeler son corps selon ses désirs. Un entraînement dans cette direction déclenche presque par réflexe un serrement des dents. Cette pression – souvent inconsciente – peut endommager les dents et les structures environnantes et entraîner un traumatisme aigu (fractures) ou chronique (attrition). Cette étude a recensé les blessures des tissus oraux auto-déclarées par les athlètes et les culturistes suite à la musculation et a déterminé la relation entre le traumatisme autodéclaré, le niveau de performance et la durée de la musculation.

Matériels et méthodes

Les données ont été rassemblées à l'aide d'un questionnaire standardisé par les membres de plusieurs fédérations de bodybuilding. L'objectif était de recueillir et d'évaluer des informations sur les culturistes (âge/sexe), leur niveau de performance (amateur/compétiteur), leur expérience en matière de blessures oro-faciales, l'utilisation d'un protège-dents et des données sur leurs habitudes alimentaires (compléments alimentaires, hormones, diurétiques, substances illégales).

Résultats

Au total, 602 questionnaires remplis ont pu être intégrés dans l'étude. 363 femmes (60,3 %, âge médian 27, IQR 23,33) et 239 hommes (39,7 %, âge médian 31, IQR 27,38) ont participé. 221 (36,7 %) se sont considérés comme des athlètes de compétition (107 femmes : 29,5 %, 114 hommes : 47,7 %) et 381 (63,3 %) comme des athlètes amateurs (256 femmes : 70,5 %, 125 hommes : 52,3 %).

33,6 % (n = 202) des participants ont déclaré des troubles de la sphère oro-faciale pendant l'entraînement. Parmi eux, 87 femmes (68 %) et 34 hommes (45,9 %) ont déclaré des problèmes au niveau de l'articulation temporo-mandibulaire, et 36 femmes (28,1 %) et 36 hommes (48,6 %) ont déclaré des blessures au niveau des dents (chippings, fractures, perte de dents, etc.). Les athlètes amateurs ont déclaré être 2,5 fois plus susceptibles d'avoir des problèmes bucco-dentaires que les athlètes de compétition (OR = 0,41, p < 0,001). Les femmes s'estimaient généralement plus susceptibles que les hommes d'avoir des problèmes bucco-dentaires liés à la musculation (OR = 1,45, p = 0,076). Les effets négatifs autoévalués sur les structures orales étaient 2,1 fois (p = 0,003) plus élevés chez les personnes qui s'entraînaient depuis dix ans ou plus. Les effets négatifs sur les tissus oraux et la prise de compléments alimentaires augmentaient avec le nombre d'années d'entraînement de musculation.

Diskussion

L'étude montre que le nombre d'années d'entraînement de musculation est un facteur important pour l'apparition autodéclarée de problèmes ou de blessures dans la région oro-faciale. Les femmes sont généralement plus susceptibles de décrire des problèmes oro-faciaux liés à la musculation. Les athlètes semblent être peu conscients des lésions dentaires liées à l'entraînement. Cela laisse supposer que le nombre de cas non déclarés est encore plus élevé. Tant les dentistes que les entraîneurs des clubs et des salles de sport ainsi que les fédérations devraient être informés des liens présentés et aussi les athlètes eux-mêmes. La fabrication d'une gouttière dentaire sportive serait fortement recommandée aux athlètes.

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