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Knowledge attitude and practices of boxers regarding dental trauma prevention by mouthguards

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Abstract

Background: Boxing, apart from being a recreational sports activity, is also an art of self-defence. It can however, cause orofacial injuries. Avulsion is a severe form of dental injury. Sports specific trauma leads to physical and psychological distress. The risk of such injuries can be minimized with the implementation of mouthguards and other orofacial protective devices among boxers. The study aims to determine the knowledge, attitude, and practices of boxers on dental trauma prevention by mouthguards.

Material & Methods: A close-ended questionnaire was distributed among 150 practicing boxers situated in the district of Jabalpur. The questionnaire sought information about the knowledge regarding the incidence of orofacial injuries and the role of mouthguards in the prevention of injuries. Their attitude and practice regarding the same were also assessed. The data were subjected to statistical analysis.

Results: The study population comprised of 69% males and 31% females. 44% had experienced dental trauma during practice. 100% were well aware of the use of mouthguards in sports. However, about 70% did not have the proper knowledge about the same. A large proportion also lacked the basic insight into the methods of management of associated dental injury. The attitude and

practice regarding the handling of avulsed tooth and usage of mouthguards were found to be minimal.

Conclusion: The practicing athletes had awareness especially through their sports-mates on the use of mouthguards in preventing orofacial injuries. 88% of them used boil and bite type of mouth guards. The majority of them did not have the idea of managing an avulsed tooth. Though most of them were in favor of using customized mouthguards but were unaware of its availability.

Keywords: Contact sports, orofacial injuries, tooth avulsion, mouth-protectors, questionnaire survey.

Introduction

Active participation in various physical activities has proven beneficial to people's mental and physical health. Boxing is one of the contact sports widely practiced all over the world. Forbes in 2003 listed boxing as one of the 10 healthiest sports. However, according to the National youth sports foundation for the prevention of Athletic injuries, contact sports activities certainly expose practitioners to the risk of orofacial traumas[1]. Various studies have portrayed boxing as one of the major causes of trauma to stomatognathic system[2-4].

Soft-tissue lacerations, abrasions and contusions, tooth intrusions, or avulsions, crown or/and root fracture, loss of one or several teeth most frequently loss of maxillary incisors are commonly found associated to any contact sports. The less frequent trauma includes fractures of the zygoma, mandibular fractures, alveolar fractures and traumatic injuries to the temporomandibular joint[1]. Orofacial traumas consequently affect an individual's esthetics and psychology. Additionally, their families suffer economic implications[2].

Educational programs addressing the importance of preventing orofacial traumas, transporting avulsed/fractured teeth properly, and the benefits from immediate treatment can account for a possible solution in reducing the rates of orofacial lesions[5,6]. Hence, the present study was aimed at investigate the knowledge, attitude, and practice of boxers on dental trauma prevention by mouthguards.

Brief History

Boxing was recorded as the first contact sport activity to use mouthguards. Initial devices simulating mouth protectors were fabricated from materials like cotton, tape, sponge or small pieces of wood. However, it took a lot of concentration to keep these materials in place consequently diverting their attention from the fight. In 1927, Jack Sharkey and McTigue fought in an elimination tournament. Sharkey managed to strike a blow to McTigue's mouth even though the former was barely able to stand. McTigue's ragged teeth cut his lip so severely that the fight had to be stopped. Shortly after this fight, boxing officials of the New York State Athletic Commission allowed boxers to use mouthguards. In 1930, the first descriptions of mouthguards appeared in the dental literature[7].

Materials and Methods

An exploratory study design in cross-sectional frame was formulated to access the knowledge, attitude, and practice of boxers in the Jabalpur district of Madhya Pradesh. A multistage random sampling technique was used to select the sample units. Out of total 250 enrolled boxers in all four institutes in the district, 150 currently practicing boxers were included in the study. Inclusion criteria were male and female boxers of 15-28 years of age while dropouts from the institutes and athletes unwilling to participate were excluded from the study. The participants were explained about the motive behind the survey and a written consent was obtained regarding the same.

A closed-ended questionnaire consisting of queries on demographic data (3), knowledge (7), attitude (5) and practice (10) were distributed by hand delivery system.

The anonymity of the participants was maintained. For quantitative analysis of the results, data were evaluated and expressed in percentage using statistics software (SPSS 16.0), thus giving more reliability and credibility to the study.

Results

The response of boxers to questions regarding their knowledge, attitude, and practice towards dental trauma and its prevention by mouthguards are listed as Tables 1, 2 and Figs. 1, 2.

The majority of boxers were male (69%) and 31% were females. 58% of participants belonged to a lower middle-class family with an income status of Rs.30, 000-49,000 per month. Most of the boxers had a record of around 40 years of practice.

100% of the respondents were well aware of the importance of mouthguard in contact sports. However, 69% of them knew about only one type of mouthguard. In the case of dental trauma, 49% of boxers preferred visiting a dental practioner. A fair population (41%) lacked the knowledge of possibility to put the tooth back into the socket. 73% did not have any idea regarding the correct method for preservation of tooth. Around 60% of respondents did not know the different methods for prevention against dental trauma.

When the attitude of the respondents was tested, 58% strongly agreed that dental trauma can occur during boxing. 66% believed that dentists play a vital role in the immediate management of dental injuries. Though 69% strongly favored the positive impact of mouthguards during practice still around 47% agreed to its ill effect on breathing. Response to practice questionnaire revealed that 44% of boxers experienced trauma during boxing. Information regarding mouthguards was largely obtained from sports mates (77%). 75% got their gum shields from sports shops instead of a dentist. Most of the respondents (88%) used boil and bite type which they needed to constantly bite on to hold it in place. Many (47%) were found to not use a mouthguard regularly, the reason behind it being difficulty in breathing. Interestingly, 96% of practitioners strongly favored using a customized mouthguard over the conventional ones.

Discussion

Boxing is a full contact-sport that poses a risk of dentofacial injuries. Journal of American Dental Association (JADA) reported that 13-39% of all dental injuries are sports-related, with 2-18% of the injuries related to the maxillofacial[1]. Mouth guards have proved a bliss against such trauma. The mouth guard is also referred to as a gum shield or mouth protector. According to The American Society for Testing and Materials mouth protector is defined as a “resilient device or appliance placed inside the mouth to reduce oral injuries, particularly to teeth and surrounding structures[2,8,9]. They are generally made from Ethylene Vinyl Acetate (EVA). Athletic mouthguards can be classified as Stock Mouthguards. (Least preferred), Mouth formed mouth guards, Custom fabricated (over a dental cast) mouth guards (Most preferred)[2]. It is non-toxic, has minimal moisture absorption, elastic and can be easily manufactured. Custom fabricated mouthguards, made under the supervision of a dentist, have been recommended by the Academy for Sports Dentistry (ASD). The ASD encourages a mandatory use of a properly fitted mouthguard in all collision and contact sports[10].

Many mechanisms have been hypothesized behind the likelihood of the mouthguards in preventing orofacial injuries. Firstly they separate maxillary and mandibular teeth and act as a shock absorber during direct impacts thus preventing fractures or dislocation. Secondly, they reduce the chances of laceration of soft tissues by

separating them from the teeth. Finally, it tends to position the jaw to absorb the impact forces that would have normally transmitted through the base of the skull to the brain[8].

An oral traumatic injury can affect both hard and soft tissues. Apart from the local injuries, dental trauma also dictates people's agony by affecting their appearance, speech, and position of teeth. An avulsion is one of the most serious dental injuries in which the prognosis is dependent on the injury to the periodontal membrane during the time the avulsed tooth is out of socket[11]. Therefore this study was focused on accessing the knowledge, attitude and practice of boxers on dental trauma prevention by mouthguards.

Almost all the athletes (100%) had awareness about mouthguards and its use in boxing. This might be attributed to the fact that all of them already were using a mouthguard of their own. Concerning to the ways to prevent dental trauma, a study conducted by Jorge et al.[12] with physical education's teachers and students showed that 74% stated knowing mouthguards. This finding is in accordance with ours as most of our athletes answered positively to this question. The fact that so many boxers knew about the mouthguard in the present study can be explained by the higher number of sports events being broadcasted by television channels, where in the use of protective devices are shown. However, these athletes have no full knowledge about the functions of the mouthguard.

The major fraction of athletes (88%) used boil and bite type of mouthguard while only 9% of them used custom made and the rest 3% relied on stock mouthguards. These results did not match with the study conducted by Ifkovits T 2015, wherein 54.2% of the boxers owned a custom-made mouthguard from the dentist[5]. Investigations presented in studies conducted by Lieger & von Arx 2006[13], Schildknecht et al. 2012[14] revealed even more contradictory results to our study, which indicated that 76.5–91% of athletes used a custom-made mouthguard. This difference is by virtue of large fraction of population belonging to low economic status and inadequate awareness regarding customized mouthguards in India. Regulatory bodies of sports should take the responsibility to educate these players and propose plans to provide financial support.

Ifkovits's study stated that 34.6% of the boxers sustained a dental accident during practice. This finding is similar to our observation where 44% of boxers experienced trauma during boxing.

69% strongly favored the positive impact of mouthguards during practice. The population providing this feedback is however, lesser than the data obtained by Ifkovits(86.2%) and Onyeaso and Adegbesan[15] (88.1%) but is higher than the study conducted by Hendrick et al.[16] (54%) . These differences in attitudes might be since those studies were conducted in developed countries where players have a greater awareness about traumatic injuries and their prevention.

Most of the athletes obtained their protective devices from the sports shop (75%) followed by fellow mates (17%). The fraction of participants buying their mouthguards from shops is quite higher than the data provided by Swiss boxers i.e. 20.7% (Ifkovits et al). The fact that the players used mouth guards of their fellow mates gives an idea of their lack of hygiene awareness. 40% of the boxers were actually satisfied with their mouthguards. 47% of the athletes mainly criticized breathing problems. The percentage was quite higher than observations in other studies (Lieger & von Arx 2006, Boffano et al. 2012[16], Ifkovits T 2015), in which the same points of criticism were frequently mentioned. Apart from breathing difficulties, fair fraction using the boil and bite type

addressed some other issues like mild pain and need for constant biting.

41% lacked the knowledge of how to act in case of the avulsed tooth while 73% did not have an adequate idea regarding the preservation and transportation of the same. The results were similar to the study conducted by Azeredo L et al 2016[5] wherein around 54% lacked the knowledge regarding action to be taken for an avulsed tooth while around 68% did not have the adequate idea regarding its preservation. About the basic knowledge on how to provide first-aid care in the case of the avulsed tooth, Jorge et al.[11]and Panzarine et al.[19] also similarly reported a high rate of misinformation about tooth avulsion. This fact is of concern as the correct management of the avulsed tooth and/or dental fragments is directly associated with a more favorable prognosis. Keeping in mind, prevention is better than cure, sports dentistry has a major role in educating the athletes regarding the preventive measures to orofacial traumas. A basic management plan should also be included in the sports curriculum.

The dentist has an important role in contributing to this knowledge since their function is to promote health, regardless of working in the public or private sector. In our study, we found that 66% believed dentists play a vital role in the immediate management of dental injuries. Therefore, the dentists are supposed to develop strategies to convey information to physical education professionals, as well as to any other sports-related practitioner involved in sports activities, and to develop actions to promote health for all.

Custom-fitted mouthguards are quite expensive than the other types of mouth guards, but at the same time, they provide the greatest degree of fit, comfort, and protection as they are made from a cast to precisely fit and cover all the teeth. A vast majority of the boxers surveyed were unaware of custom made mouthguards. However when they were educated regarding the same during the survey, it was interesting to note that 96% of boxing practitioners strongly favored using a customized mouthguard over the conventional ones. This shows the majority of boxers appreciate and embrace the use of professionally advised appropriately fabricated mouthguards. Unfortunately, there are a few barriers faced by these players that prevented the use of customized mouth-protectors.

1. Most of the players belonged to lower middle class family for whom custom-made mouthguards from the dentist are too expensive and from their point of view, the cheaper versions serve the purpose just as well.
2. The maximum fraction used boil and bite type that indicated a lack of knowledge regarding customized mouthguards
3. Lack of dentists' efforts to create awareness among boxers in the city regarding dental trauma as well as its prevention and management.

Limitations

The limitations of this study are

The questionnaire study provided a self-reported data, which can lead to an inaccurate information due to individual perceptions of the questions.

Study carried out included the assessment of knowledge, attitude, and practice of only one type of contact sports i.e boxing not taking into account other sports that mandate the use of mouth guards.

This was a district level survey. It could be expanded to state or national level in order to know the level of awareness among Indian boxers that would aid in policy making.

Conclusion

Knowledge, attitudes, and practice regarding orofacial trauma management and its prevention by protective equipment among boxers of Jabalpur district were poor.

Though many athletes acknowledged the importance of using mouthguards yet there was a relatively large gap between what was understood and what was practiced. Also, a need was felt for various educational programs to be conducted by the dental fraternities to make the athletes understand the importance of a customized mouthguard over the boil and bite type.

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Legends Figure and Table

Table 1: Demographic Data of Participants.

Background	Frequency	Percentage
Sex		
Male	69	69.0
Female	31	31.0
Years of Practice		
0-2	26	26.0
2-5	38	38.0
5-7	28	28.0
8-10	7	7.0
>10	1	1.0
Family Income		
10 000-29 000	11	11.0
30 000-49 000	58	58.0
50 000- 69 000	30	30.0
70 000-90 000	1	1.0

Table 2: Assessment of Knowledge of Boxers.

Knowledge of use of mouth guards		Frequency	Percentage
	Yes	100	100.0
Type of mouth guards	One	69	69.0
	Two	28	28.0
	Three and more	3	3.0
In case of dental trauma, where should you go	Medical practitioner	20	20.0
	Dental practitioner	49	49.0
	Don't know	31	31.0
Knowledge of possibility to put the tooth back in its socket	Yes	23	23.0
	No	36	36.0
	Don't know	41	41.0
Knowledge of maximum time for the teeth to be out of the mouth before it is put back	Within 1 hour	3	3.0
	1 Day	9	9.0
	Don't know	88	88
Knowledge of correct method to preserve the tooth	Dry	4	4.0

	Wet	23	23.0
	Don't know	73	73.0
Knowledge of methods to prevent dental trauma	Yes	24	24.0
	No	17	17.0
	Don't Know	59	59

Figures

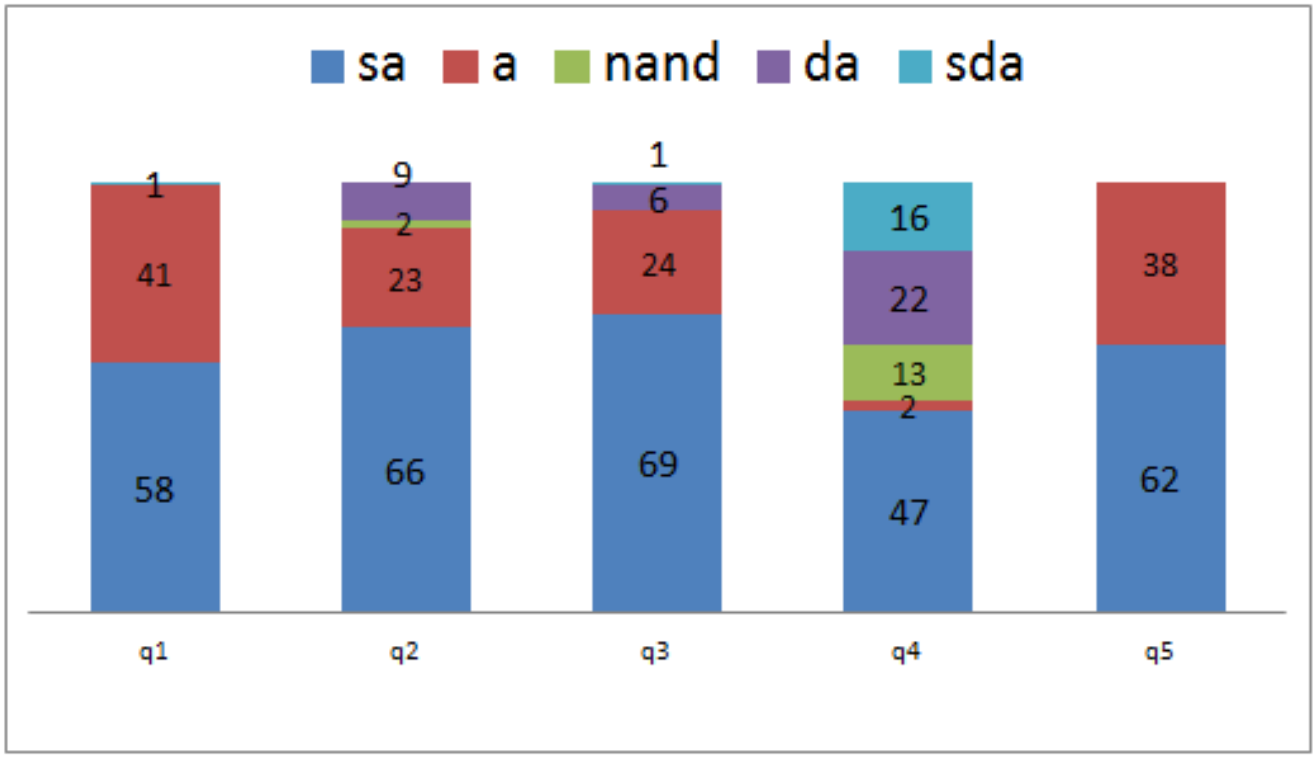
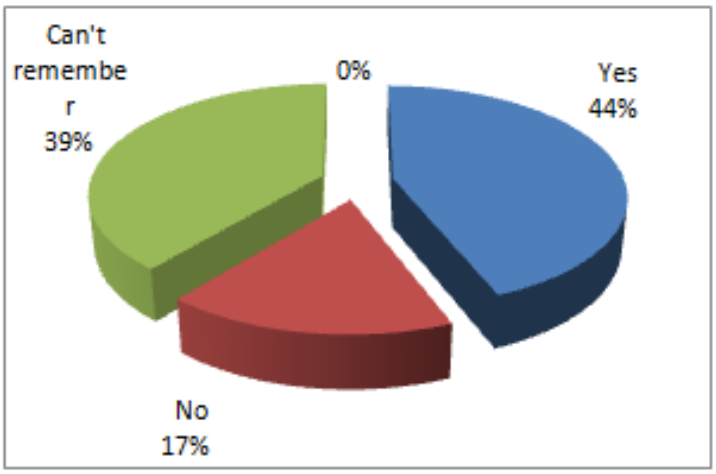


Figure 1: Assessment of Attitude of Boxers. sa- strongly agree, a- agree, nand- neither agree nor disagree,da- disagree, sda- strongly disagree, q1 – Dental trauma can occur during boxing, q2- Dentists play a role in immediate management of dental injuries, q3- Use of mouthguard is important during sports practices, q4- Mouthguard can interfere during sports practice, q5-Your mouthguard protects you from sports injuries.



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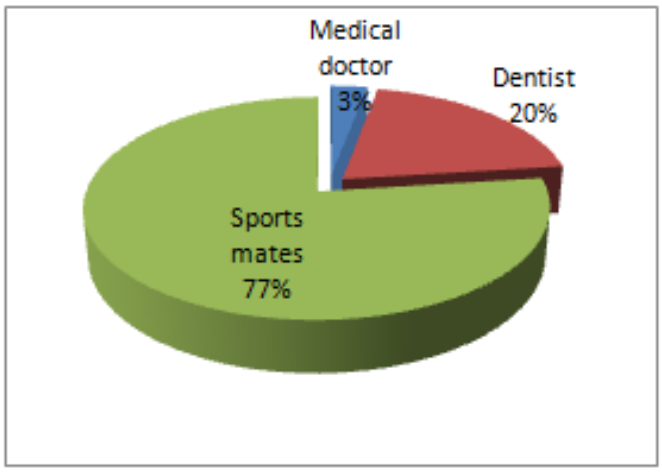

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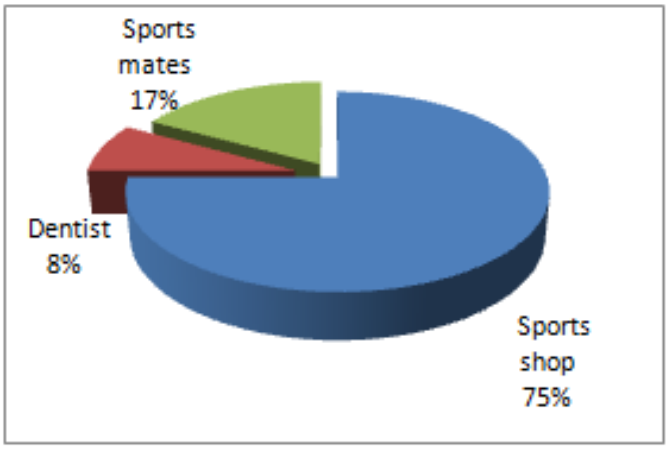

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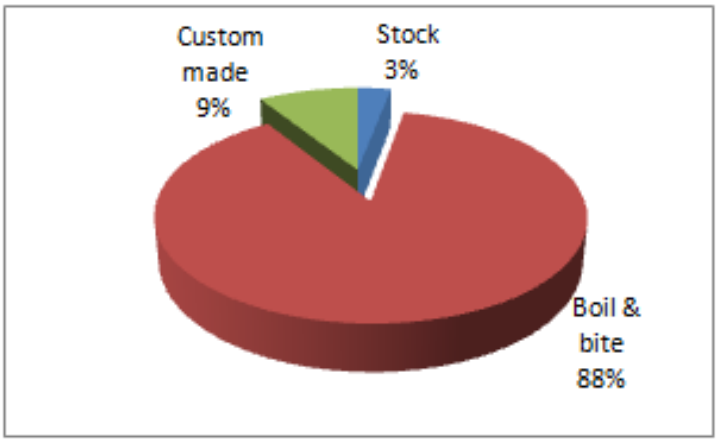

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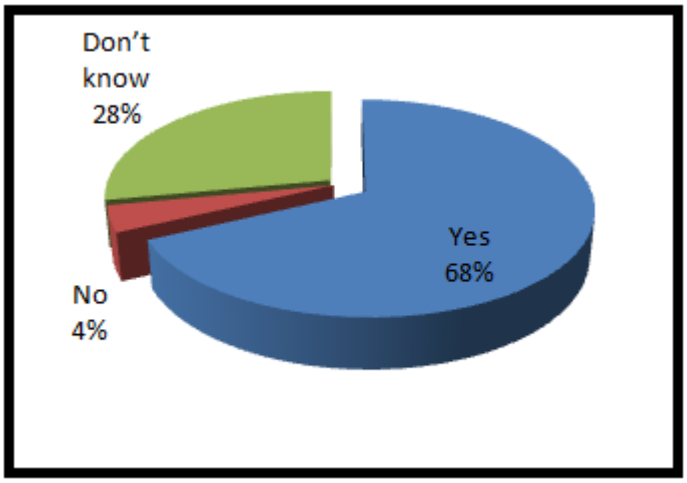

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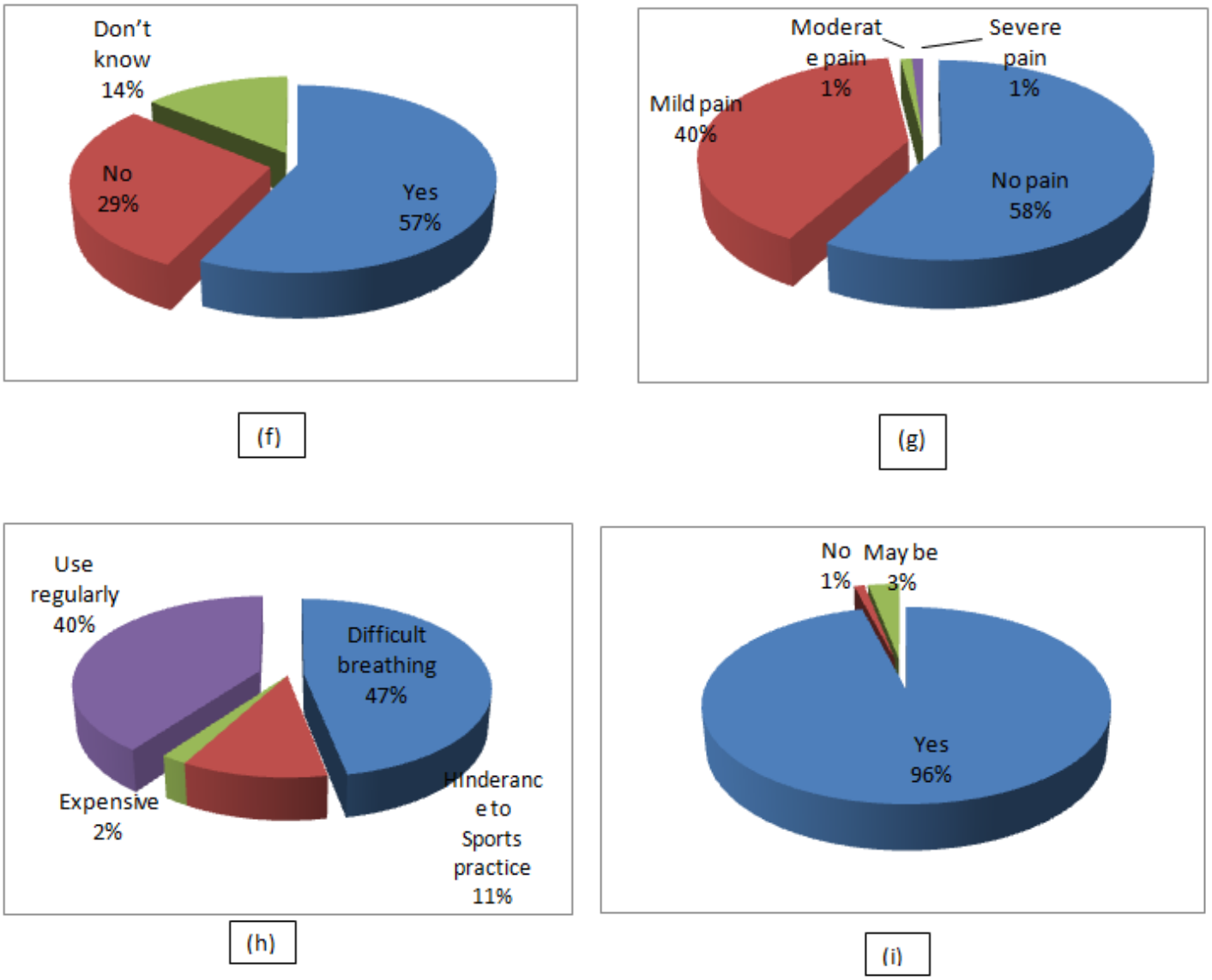

Figure 2: Assessment of Practice of Boxers. (a) Experience of trauma during boxing, (b) Information about mouthguard provided by, (c) Mouthguard obtained from, (d) Type of mouthgaurd used by the respondents, (e) Mouthguard covers the back teeth region entirely, (f) Need to constantly bite on mouthguards to hold it in place, (g) Pain experience on blow with mouthguard, (h) Reason of not using mouthguard regularly, (i) Preference for customised mouthguard.