

FEATURE

Dentist Vinisha Ranna, 25, from Pune in India, has created a survey to investigate how the teeth are affected during scuba dives. Vinisha, who studied dentistry in Mumbai and is now a researcher at the University of Rochester's Eastman Institute for Oral Health in Rochester, New York, experienced peculiar sensations in her teeth after her first dive in Goa in 2014. Speaking to other divers she discovered that many had experienced teeth and jaw problems when diving, which led to her decision to research the subject. *BDJ* News Editor Kate Quinlan spoke to Vinisha to find out more.

At what point in your first dive did your teeth start to feel strange?

Towards the end of my dive, I began to feel some jaw fatigue. We were diving off a boat, and when I got back on the boat, I felt my teeth were not coming together as they normally did. A comparison would be how it feels when you have to keep your mouth open for a long time at the dentist's.

I asked my fellow divers about it, and was surprised to find that most of them, at some point, had experienced some form of dental discomfort related to diving.

Did you think that the symptoms were caused by the mouthpiece on your regulator [breathing apparatus]?

The stock regulator I was using on my first dive was too large. Mouthpiece design certainly may impact jaw joint pain experienced during diving. In fact, the *British Journal of Sports Medicine* published a study in 2001 comparing custom fitted mouthpieces with stock mouthpieces. They found that fully customised mouthpieces could significantly reduce jaw joint and jaw muscle problems.¹ This may be because customised mouthpieces are better adapted to the diver's unique jaw joint anatomy. This might allow for a more natural and comfortable positioning of the jaw while diving.

DIVING AND DENTISTRY

Does breathing compressed air through a mouthpiece while scuba diving have an impact on the teeth? A dentist based in the US is conducting some research to find out.



Vinisha diving on the wreck of cargo vessel *Medafaru* in Sri Lanka

Clenching is another factor which may contribute to teeth, jaw muscle and joint pain. Not just the excitement of the diver, but also diving in cold water has been suggested to increase clenching down on the mouthpiece² (I have to frequently remind myself to relax my jaw while diving).

Have you had any other dental symptoms during or as a result of scuba diving since that first dive?

I am passionate about diving, and have continued to dive, thankfully without any dental discomfort.

You say that fellow divers spoke of dental discomfort during dives. What sort of problems did you hear about?

Over time, I have heard some really interesting stories – mostly about severe tooth pain and loosening of caps and teeth fillings. The pilot study I subsequently conducted discusses this in detail. Tooth squeeze (tooth pain caused during a diver's ascent when air is trapped in a dental filling or cavity) was the most common problem.

How did this lead to you creating the current survey?

I have always been interested in dental research, and I was curious to know what role dentists could play in preventing teeth and jaw pain during a dive. Considering that the regulator is held in the mouth, any disorder of the oral cavity could potentially increase the diver's risk of injury. I conducted the pilot study to determine the effects of diving on teeth. Based on this study, I designed the current, more comprehensive survey.

The survey has been posted online via Eastman's social media platforms to diving forums, dive clubs and social media pages dedicated to divers. We are also working with



Vinisha Ranna

diving magazines to recruit divers for the survey.

The survey will be available for one year; however, we have almost reached the required number of responses to start analysing the results. They should be ready by the end of June.

We are considering submitting the study to journals with a focus on sports medicine. We are also maintaining a log of divers who have written in requesting a copy of the results. Additionally, the Divers Alert Network (DAN) posted our study to their online platforms and have requested that the results are sent to them.

Do you think this study may lead onto further diving and dentistry related studies?

Absolutely! One wonderful aspect of research is that while you get answers to important questions, it also raises new questions. We don't know what we don't know and I'm looking forward to working on new studies related to divers and dental health to advance our knowledge in this area.

Diving research is a fascinating field, and there is a limited amount of research that has been conducted so far. This is changing, as more researchers are looking into safety and health effects of diving. It would be very useful to have more data on the effects of diving on breathing performance and human physiology.

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- Rogoff A. Diving damage. *J Am Dent Assoc* 2010; **141**: 15; author reply 15–16.