



## Awareness of ORAC assay among dental students

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### ABSTRACT

The Oxygen Radical Absorption Capacity (ORAC) assay estimates the suppression of peroxy radical-mediated oxidation by molecules of concern. This calculates the quality as Trolox equivalent and provides both repression duration and the degree of oxidation suppression. This same test could be used to calculate the antioxidant capacity of nutrition. The survey was performed for assessing awareness of ORAC assay amongst dental students. This was a questionnaire implemented cross-sectional type of survey comprising 100 dental college students in Chennai. A self-designed questionnaire with 10 queries eliciting the knowledge and awareness about applications of the ORAC assay technique was distributed among dental college students. Questionnaires were circulated through an online website survey planet. The questions explored the awareness of ORAC assay technique, diagnostic indications of ORAC assay technique, limitations of ORAC assay technique and mechanism of ORAC assay technique. After the responses were received from 100 participants, data were collected and analysed. 67% of the respondents were aware of the ORAC assay technique. 52% were aware of diagnostic indications of the ORAC assay technique. 45% were aware of the limitations of the ORAC assay technique. 35% were aware of the mechanism of the ORAC assay technique. The awareness about the ORAC assay technique and its applications were less among dental students. Increased awareness and educational programs should be initiated to spread knowledge about the ORAC assay technique among all students and clinicians.



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### INTRODUCTION

The development of numerous chronic and degenerative diseases, such as malignant growth, coronary disease, and neuronal degradation, such as

Alzheimer's as well as Parkinson's disease, has been thought to be due to oxidative stress to a limited degree. In fact, oxidative pressure was involved throughout the time being spent settling down on etiologic factors ([Antolovich et al., 2002](#); [Cutler et al., 2012](#)).

While the human body has developed numerous mechanisms to eliminate free radicals, such as the receptive oxygen species, from the body, it is not 100% competent ([Packer, 2019](#)). Diets rich in natural foods, nuts and vegetables are seen as an amazing source of antioxidants. Various minerals and nutrients work as dietary antioxidants regardless of their other natural capabilities. These include Vitamin C, E and its isomers along with selenium ([Awika et al., 2003](#); [Nystrom and Osiewacz, 2004](#)).

Antioxidants are defined as any material required in minute quantities that may delay or impede the oxidation of the oxidizing substrate. Vital antioxidants delay and inhibit the onset of oxidation, whereas supplementary antioxidants avoid oxidation through eliminating substrate or through annihilating free superoxide anion (Paoletti *et al.*, 2012). Although the term first was extended to just the lipid oxidation, it's also currently generalized to oxidation in proteins, DNA and includes all of the defined structures that do not really require antioxidant capacity (Christen, 2000; Frankel and Meyer, 2000).

The Oxygen Radical Absorption Capacity (ORAC) assay tests the impediment of peroxy radical-prompted oxidation by intrigue blends. This quantifies the value as Trolox equivalents which integrates both the time of obstruction and the degree of oxidation restraint. This assay could be used to measure its antioxidant movement of food. The methodology developed by Prior *et al.* is used to calculate all hydrophilic and lipophilic ORAC water and lipid solvent antioxidant mixtures. Notwithstanding the ORAC assay, other essential proportions of antioxidant ability (AC) include ferric particle-lowering antioxidant power (FRAP) and Trolox-like antioxidant potential (TEAC) assays (Prior *et al.*, 2003; Coulston and Boushey, 2008).

These assays depend on various fundamental components utilizing diverse radical or oxidant sources and hence produce unmistakable qualities and can't be looked at straightforwardly. The ORAC assay is considered by some to be the best technique in view of its natural importance to the *in vivo* antioxidant adequacy (Coulston and Boushey, 2008). Since antioxidant mixes with disparate substance structures interface with various radical sources in an unexpected way, the connection between any two AC techniques will be very low whenever considered overall nourishments. The survey was performed for assessing awareness of ORAC assay amongst dental students.

## MATERIALS AND METHODS

This was a questionnaire implemented cross-sectional type of survey comprising 100 dental college students in Chennai. A self-designed questionnaire with 10 queries eliciting the knowledge and awareness about applications of the ORAC assay technique was distributed among dental college students. Questionnaires were circulated through an online website survey planet. The questions explored the awareness of ORAC assay technique, diagnostic indications of ORAC assay technique, limitations of ORAC assay technique and

mechanism of ORAC assay technique. After the responses were received from 100 participants, data were collected and analysed.

## RESULTS AND DISCUSSION

17% of the respondents were aware of ORAC assay technique (Figure 1). 12% were aware of diagnostic indications of ORAC assay technique (Figure 2). 9 % were aware of limitations of ORAC assay technique (Figure 3). 7% were aware of the mechanism of ORAC assay technique (Figure 4).

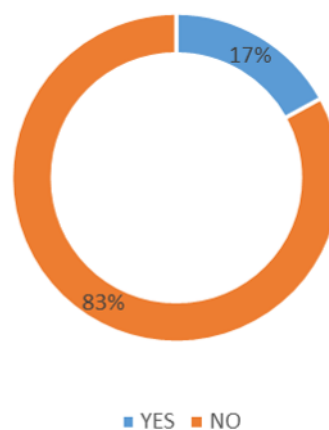


Figure 1: Awareness about ORAC assay technique

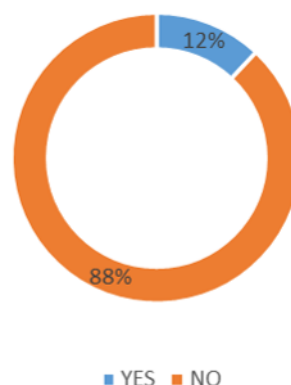
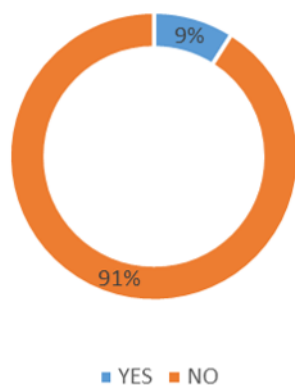
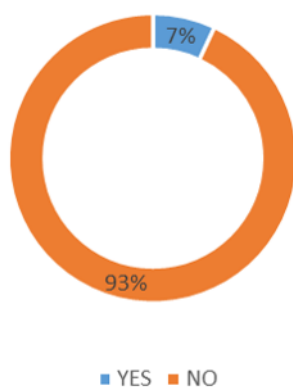


Figure 2: Awareness about diagnostic indications of the ORAC assay technique

The ORAC value is a technique used to estimate an *in vitro* antioxidant concentration of different foods as well as enhancements. Over the past twenty years, researchers working at the National Institutes of Health (NIH) and the USDA have really influenced it. Measurement *in vivo* is beyond the realm of imagination, and thus the precise relation between the ORAC calculation of the food and any possible medical benefit that may have occurred is controversial. Not with standing, numerous researchers estimate that nourishments higher on the ORAC scale



**Figure 3: Awareness about limitations of ORAC assay technique**



**Figure 4: Awareness about the mechanism of the ORAC assay technique**

might be increasingly powerful at killing free radicals. Albeit doubtful, as indicated by the free-radical hypothesis of maturing, this may slow the oxidative procedures and free radical harm that can add to age-dependent degeneration and infection.

This same assay evaluates the oxidative devaluation of a fluorescent atom (beta-phycoerythrin or fluorescein) after blending with oxygen radicals generators such as azo-initiator mixtures. Azo-initiators were also considered to develop a peroxy radical by heating, that further affects the fluorescent molecule, resulting in a loss of fluorescence. Antioxidants are deemed to protect the fluorescent atom from oxidative deterioration. The safety shall be assessed using a fluorometer.

Fluorescein has become the most widely used fluorescent measure. The phosphorescent force decreases as oxidative degradation persists, so this power is routinely transcribed for 35 minutes just after the expansion of the azo-initiator. Up to now, AAPH (2,2'-azobis(2-amidino-propane) dihydrochloride) is the sole free-radical generator used. Degeneration (or disintegration) of fluorescein is estimated to be close to the antioxidant eases back

the fluorescence rot.

Rot bends (fluorescence force versus time) are recorded, and the territory between the two rot bends (with or without antioxidant) is determined. In this manner, the level of antioxidant-interceded security is measured utilizing the antioxidant Trolox as a standard. Various groupings of Trolox are utilized to make a standard bend, and test tests are contrasted with this. Results for test tests (nourishments) have been distributed as "Trolox reciprocals" or TEs (Huang *et al.*, 2005; Garrett *et al.*, 2010).

Another benefit of the use of ORAC strategic plan to evaluate the antioxidant boundaries of the materials would be that it perceives the antioxidant boundaries of tests with or without lax intervals. This really is particularly useful while assessing nutrients and additional features that contain complex accessories with distinct medium and rapid-acting antioxidants, as well as fixings with consolidated effects which can not be predicted.

Disadvantages of this technique are: 1) only antioxidant movement against specific radicals is estimated; whether, as is possible, superoxide anion radical configuration has never been clearly illustrated; 2) the idea of a harmful response is not described; 3) there is no evidence that free radicals are involved in this response; and 4) there really is no evidence that ORAC values have had any natural reactions. Furthermore, the link here between ORAC values and the medical advantage has not really been identified (El-Shemy, 2017).

Coming from the logical invalidation of a physiological profundity of ORAC, the USDA, which was then grouping and distributing ORAC information for more than 10 years, withdrew its web distribution of ORAC values for basic American food in May 2012. Several modified ORAC strategies were proposed. The vast majority of them use similar criteria (e.g. estimate of AAPH-radical interceding harm to fluorescein); however, ORAC-EPR, electron paramagnetic reverberation dependent on ORAC technique, explicitly gauges the reduction of AAPH-radical levels by just the rummaging operation of the antioxidant material (Apak *et al.*, 2018; Tomer *et al.*, 2007).

## CONCLUSION

The awareness about the ORAC assay technique and its applications were less among dental students. Increased awareness and educational programs should be initiated to spread knowledge about the ORAC assay technique among all students and clinicians.

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The authors declare that they have no funding support for this study.

### Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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