Awareness on innovative techniques in dentistry among dental patients

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\textbf{ABSTRACT}

For decades, going to the dentist was considered an undesirable experience. It involved sitting under a bright light and having your mouth invaded with a variety of tools. Even though dental health was very important to your overall health and for having a nice smile, among other benefits, many people chose to steer clear of dental visits because of how uncomfortable it was for them. Fortunately, new technological advancements are making trips to the dentist quicker, easier, less painful and more reliable. Due to these advancements, the dental industry was growing rapidly and looking much different than it did in past years. A greater emphasis on treatment and prevention will mean fewer caries (cavities) in patients and less risk of periodontal disease. Similar to innovation within other health care professions, these new technologies will have a huge impact on how dental professionals treat their patients and how people take care of their oral health at home.

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\textbf{INTRODUCTION}

“Innovation was defined as a new idea, creative thoughts, and new imagination was a form of device or method” (Ariga \textit{et al.}, 2018). Innovation was also viewed as the application of better solutions which meet new requirements, unarticulated needs (Jyothi, 2017). Use of pre-program equipment is dental restoration, for dental surgeries and to the extent which are the pre-program toothbrushes (Selvan and Ganapathy, 2016). Patients would like to prefer the latest treatment done with advanced equipment (Ganapathy \textit{et al.}, 2016; Selvan and Ganapathy, 2016). Understanding the latest development and trends in dentistry make it easier for the patients and precision of the treatment (Subasree \textit{et al.}, 2016). It was a scientific treatment, reliability and less pain. (Jain \textit{et al.}, 2017)

Previous research was as minimal intervention dentistry-a new frontier in clinical dentistry (Tatullo, 2017). A new technique to determine the vertical dimension of occlusion from anthropometric measurements of fingers (Subramani \textit{et al.}, 2012). Evaluation of dental ceramics in the twentieth century (Goldstein, 2018).

If the dentists do not upgrade him/her, patients will not receive the upgraded treatment, which was relatable, painless and safer (Freedman, 2011). These are previous research compared with this study (Spagnuolo and Sorrentino, 2020).
This research was needed to know about the amplitude of the patients (Vijayalakshmi and Ganapathy, 2016). Because of internet connectivity, it has made the patient’s much more knowledge so, with this survey, we can understand the patient’s knowledge ability (Vijayalakshmi and Ganapathy, 2016; Ganapathy et al., 2017).

MATERIALS AND METHODS

This study involved in the online survey among dental patients, which was all over the dental patients in this country. The 100 people involved in this survey, the online survey made using google forms. It was a simple random sampling method, elected to minimize sampling bias in which sample was collected randomly from common people in Chennai. This survey was done on the people visiting dental so that practicing dentist has the knowledge that the patients are well-informed of the advancement in dentistry, it can be generalized. The data collection was arranged in an order. The questionnaire are standardized questionnaires consisting of knowledge, time, management, interest and understanding. The data collection software was google forms. The data manipulation through excel spreadsheet output variables. The method of representation of each output variables are the random variables. (Figure 1)

RESULTS AND DISCUSSION

The results are based on the survey reports, 15 questions were asked, and all the questions were answered by the 100 respondents. No questions were skipped in this survey. In the analysed results, we are able to understand that the people will get to know more about the innovation in dentistry.

From Figure 2, Male participants were 53% (green) and female participants were 47% (red). From Figure 3, Chi-square test was analysed and the p-value was 0.005 (<0.05 indicating statistically significant). From Figure 4, 82% of the participants answered "Yes" (green) and 18% of the participants answered "No" (red). From Figure 5, 72% of the participants answered "Good" (red) and 28% of the participants answered "Bad" (blue).

From Figure 6, Chi-square was analysed and the p-value was 1.173 (>0.05 indicating statistically not significant). From Figure 7, 42% of the participants answered getting injection (red), 35% answered scaling (yellow), and 17% answered other surgical procedures (orange). From Figure 8, Chi-square test was analysed and the p-value was 0.120 (>0.05 indicating statistically not significant).
Figure 4: This pie chart represents patients who have been to dental offices.

Figure 5: This pie chart represents the dental treatment experience in dental office.

Figure 6: The bar graph showing correlation of gender about their experience of pain during dental procedures.

Figure 7: This pie chart represents the procedures which were painful while treating patients.

Figure 8: The bar graph showing correlation of gender for suggesting dental treatments for friends and relatives.

Figure 9: The suggestion of treatments with friends and relatives if the dental treatment was without pain.
Figure 10: The patients getting a needle prick without pain

Figure 11: This pie chart represents about patients making an impression which would not lead to gagging

Figure 12: The bar graph showing correlation of gender about the advanced intra oral scanner, which can be made as an alternative method to make an impression

Figure 13: This pie chart represents about the patients using alternative impression method

Figure 14: The bar graph showing correlation of gender about innovative techniques in dentistry, whether these techniques reduce the working time in the dental treatment

Figure 15: This pie chart represents about the reduction of working time in dentistry to treat patients
Figure 16: The bar graph showing correlation of responses based on gender about the allowance of robots

Figure 17: This pie chart represents the allowance of robots working with less pain power and precision in dentistry

Figure 18: The bar graph showing correlation of gender about laser treatment, whether it will be painful or not

Figure 19: This pie chart represents about lasers in dentistry

Figure 20: This pie chart states the opinion of laser treatment will be painful or not

Figure 21: This pie chart represents the advantages of lasers in dentistry
Figure 22: This pie chart represents the innovative techniques which would be comfortable in dentistry.

From Figure 9, "Yes" was answered by 75% (green) and "No" was answered by 25% (red) of the participants. From Figure 10, "Yes" was answered by 79% (green) and "No" was answered by 21% (red) of the participants.

From Figure 11, 71% of the participants answered "Yes" (green) and 29% of the participants answered "No" (red). From Figure 12, Chi-square test was analysed and the p-value was 0.645 (<0.05 indicating statistically not significant). From Figure 13, 78% of the participants answered happy (blue) and 22% of the participants answered unhappy (green).

From Figure 14, Chi-square test was analysed and the p-value was 0.010 (>0.05 indicating statistically significant). From Figure 15, 74% of the participants answered "Yes" (red) and 26% of the participants answered "No" (blue).

From Figure 16, Chi-square was analysed and the p-value was 0.750 (<0.05 indicating statistically not significant). From Figure 17, 55% of the participants answered "Yes" (red), and 45% of the participants answered "No" (blue). From Figure 18, Chi-square was analysed and the p-value was 2.206 (<0.05 indicating statistically not significant).

From Figure 19, 49% of the participants answered "Yes" (green) and 51% of the participants answered "No" (red). From Figure 20, 56% of the participants answered "Yes" (red) and 44% of the participants answered "No" (green) and 44% of the participants answered "No" (red).

From Figure 21, 49% of the participants answered "Yes" (green) and 51% of the participants answered "No" (red). From Figure 22, 71% of the participants answered "Yes" (green) and 29% of the participants answered "No" (red). From Figure 23, 65% of the participants answered "Yes" (green) and 35% of the participants answered "No" (red).

From Figure 23, 70% answered "Yes" (green) and 30% of the participants answered "No" (red).

In this study, Red denotes good and blue denotes bad. Maximum responses were given by male students (53). The X-axis represents gender. Y-axis represents the number of counts. There is a significant difference in responses between gender. (Figure 3, Figure 6, Figure 8, Figure 12, Figure 14, Figure 16, and Figure 18)

In this survey, it was observed that the people answered "Yes" for the survey. The question was many people had been to dental offices 82% of the people answered "Yes" and many people experienced more dental treatment. This study was among dental patients in which 100 people responded to this survey (Ashok et al., 2014; Venugopalan et al., 2014; Ashok and Suvitha, 2016).
In the present study, it was compared with 15 pie charts containing questions like do you experience dental procedures and treatment without pain (Bartolo, 2009). In which most of the people answered “Yes” in the present study (Ryu and Parsons, 2008; Bartolo, 2009). It was related to similar studies comparing with the present study. The first study which was compared was (Simonsen, 1991), and the second study was the (Senzon, 1999). The third study was the (Jedynakiewicz, 1992) and the last study compared with (Lévesque et al., 2015). In these citations, many of the people answered “Yes” for the similar 15 questions. (Folayan, 2020)

The results were based on survey reports. The limitation for this survey was operation bias, low sample size and population selected-patients visiting dental clinic (Kamalanand et al., 2018; Folayan, 2020). The sample size was 100 people. This survey was taken under the age group between 18-70 years of age (Katsoni and Stratigea, 2015).

This survey was taken to the people who are having knowledge about awareness in innovative dentistry. (Duraisamy et al., 2019) The main future scope of this topic is future innovation can be done, use of better instruments and more awareness on innovative techniques in dentistry. (Williamson et al., 2020).

The top innovations in dentistry in dental professions are smart toothbrush, digital dentures, augmented reality, teledentistry and intraoral camera (Ashok et al., 2014; Venugopalan et al., 2014; Ashok and Suvitha, 2016). Lasers dentistry are now being used in both diagnosis and treatment (Basha et al., 2018; Kannan and Venugopalan, 2018). Dentists are using “soft tissue lasers” for minor gum surgery—but down the road, they may hand these procedures over to computers (Obaid, 2018). “Hard-tissue lasers” could ultimately replace whining high-speed dental drills, removing tooth decay with the aid of tiny, digitally-controlled mirrors. (Ajay et al., 2017) However, the hefty price tag on these devices will have to come down before they are widely used.

The limitation of the study is only 100 sample sizes. The future scope of the study is the innovation can be done, use of better instruments and more awareness on innovative techniques in dentistry.

CONCLUSION

Within the limitations of this study, it was observed that many people should know more about the innovations in dentistry and limitations of these techniques.

Conflict of Interest

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

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