

## Knowledge and Awareness on Various Suturing Techniques Used in Minor Oral Surgeries Among Dental Students

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### ABSTRACT

There are oral surgical procedures that are part of the broad scope of general dentistry. These include routine oral surgery such as the extraction of teeth, suturing wounds, and biopsying suspicious soft tissue lesions. The ability to suture is one of the essential skills required of anyone planning to perform surgery. Learning to suture in an expert manner requires an understanding of the proper techniques and dedicated practice. The aim of the study is to evaluate the knowledge and awareness on various suturing techniques used in minor oral surgeries among dental students. An online questionnaire was prepared and circulated among the students of dental colleges. The sample size is 100. The data was tabulated and then imported to SPSS software by IBM and the statistical chi square test was done. 91% of the students were aware of the various suturing techniques practiced in dentistry. 47% of the students use simple continuous suturing technique in their practice. When the correlation was done between best suture material and best time for suture removal, P value was 0.000 which was statistically significant. Within the limits of the study, dental students were aware of various suturing techniques used in minor oral surgeries.

**KEY WORDS:** DENTAL STUDENTS, SUTURE MATERIAL, ORAL SURGERIES, SUTURING TECHNIQUE.

### INTRODUCTION

Successful dental suturing in oral surgery is dependent on accurate coaptation of the flaps. Various methods and materials like sutures, stents, paste dressings, tissue tacks and adhesives have been used for precise flap placement. Suturing has remained the most popular method (Andrade, Weissman and Reis, 2006). The term

“suture” describes any strand of material utilized to ligate blood vessels or approximate tissues. The technique of closing wounds by means of needle and thread is several thousand years old (‘Atlas of cosmetic and reconstructive periodontal surgery’, 1995). The history of surgical sutures can be traced back to ancient Egypt, and the literature of the classical period contains a number of descriptions of surgical techniques involving sutures (Marsh, 2001). Before catgut became the standard surgical suture material towards the end of the 19th century, many different paths had been followed to find a suitable material for sutures and ligatures (Gomez, 2007). Materials that had been tried included gold, silver and steel wire, silk, linen, hemp, flax, tree bark, animal and human hair, bow- strings, and gut strings from sheep and goats. At the beginning of the 19th century metal threads were tested as suture material (Wilson, 2006; Gomez, 2007).

### ARTICLE INFORMATION

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At that time inertness of a material with respect to body tissues was considered an advantage. Nevertheless, metal threads had major disadvantages: their stiffness rendered knot-tying more difficult and could easily result in knot breakage; in addition, suppuration of the wound edges occurred frequently (Howe and Zamet, 1971). These negative experiences with metal contributed to the establishment of silk as the number one suture material (Kim et al., 2011). Wounds sewn with silk cicatrized within a few days, and the small knot caused no problems. For these reasons most surgeons at that time chose silk for sutures and vessel ligatures (Siervo, 2008).

A variety of suture materials and suture/needle combinations are available. The choice of suture for a particular procedure is based on the known physical and biologic characteristics of the suture material and the healing properties of the sutured tissues (Dragovic et al., 2020). The selection of suture material is based on: The condition of the wound, the tissues to be repaired, the tensile strength of the suture material, knot-holding characteristics of the suture material, and the reaction of surrounding tissues to the suture materials (Postlethwait, Willigan and Ulin, 1975).

Suturing is an important aspect of any dental or surgical procedure where there is either cutting or injury to the soft tissue in the oral cavity (Taylor and Bayat, 2003). Proper placement of sutures can help in faster and proper healing of the tissues involved (Trimbos, Van Rijssel and Klopper, 1986). It helps in primary healing of the wound site and also prevents any secondary infections. It is very important to note that the selection of the correct type of suture needle in dentistry is as important as the suturing technique as it helps in properly piercing and also maintaining the integrity of the tissue (Malik, 2016).

With a rich case bank established over 3 decades we have been able to publish extensively in our domain (Abdul Wahab et al., 2017; Eapen, Baig and Avinash, 2017; Patil et al., 2017; Jain and Nazar, 2018; J et al., 2018; Marimuthu et al., 2018; Wahab et al., 2018; Abhinav et al., 2019; Ramadorai, Ravi and Narayanan, 2019; Senthil Kumar et al., 2019; Sweta, Abhinav and Ramesh, 2019). Based on this inspiration we aim to estimate the knowledge and awareness on various suturing techniques used in minor oral surgeries among dental students.

## MATERIAL AND METHODS

An online questionnaire was prepared and circulated among the adolescent population. This questionnaire was prepared using a survey planet. The questionnaire consists of 12 questions. The sample size for the study was 100. It was an online setting where two reviewers are involved in this study for the validity checking of the questionnaire. The data was collected, verified, tabulated and analysed. All statistical analysis was done using SPSS by IBM. The statistical Chi square test was done, where if the p value is found out to be less 0.05, it is statistically significant. The data was imported to SPSS

and the descriptive statistics with frequency analysis was done. The obtained data were represented graphically as bar charts. The dependent variables considered for the study are dental students, suturing, minor oral surgeries and the independent variables are the cause of the treatment and age of the patient.

## RESULTS AND DISCUSSION

A total of 100 dental students participated in this survey. When asked if the students were aware of various suturing techniques practiced in dentistry, 91% of the students were aware and 9% of the students were not aware of various suturing techniques practiced in dentistry (Figure 1).

Figure 1: Bar chart showing responses to the question, "Are you aware of the various suturing techniques practiced in dentistry?". X axis represents the awareness on various suturing techniques practised in dentistry and Y axis represents the number of dental students participated in the survey. Majority of respondents reported "aware" (91%). Blue indicates "aware" and green indicates "not aware"

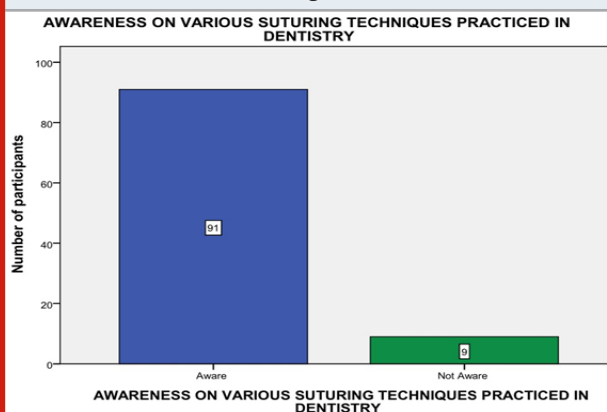
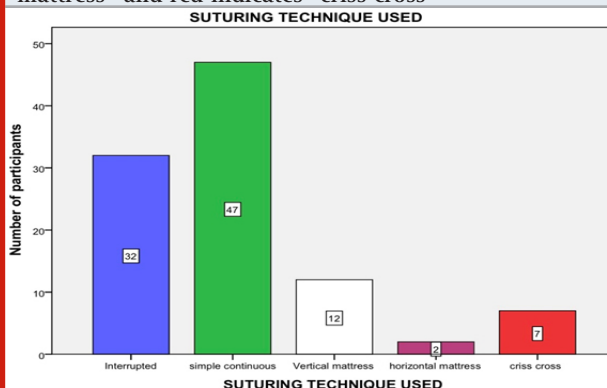
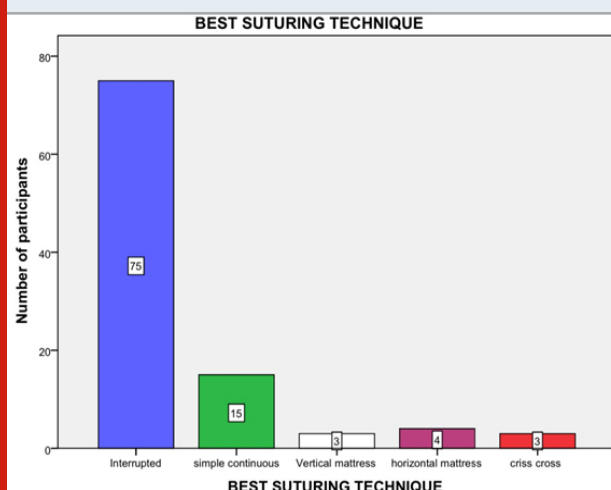


Figure 2: Bar chart showing responses to the question, "Which suturing technique do you use?". X axis represents the suturing technique used by the dental students and Y axis represents the number of dental students participated in the survey. Majority of respondents reported "simple continuous suturing technique" (47%). Blue indicates "Interrupted", green indicates "simple continuous", white indicates "vertical mattress", violet indicates "horizontal mattress" and red indicates "criss cross"



A study given by Koshak HH, 2017(Koshak, 2017), states that knowledge of the suture, needles (type, size, shape), instruments, and techniques are absolutely necessary in order to be a competent surgeon. There is no suture superior to the others in each aspect. The differences in terms of tissue reaction and bacterial adhesion between sutures should be always considered in the selection of the appropriate suturing material.

Figure 3: Bar chart showing responses to the question, “Which one of the following suturing techniques, do you think is the best?”. X axis represents the best suturing technique in the opinion of dental students and Y axis represents the number of dental students participated in the survey. Majority of respondents reported “Interrupted suturing technique”(75%). Blue indicates “Interrupted”, green indicates “ simple continuous”, white indicates “vertical mattress”, violet indicates “horizontal mattress” and red indicates “criss cross”



The students were asked about the suturing technique they prefer, where 47% of the students prefer simple continuous suturing technique, followed by interrupted suturing technique with 32%, vertical mattress suturing technique with 12%, criss cross suturing technique with 7% and horizontal mattress technique with 2% (Figure 2). A study given by Terrence J Griffin, et. al, 2011 (Griffin, Hur and Bu, 2011), shows that simple interrupted sutures were used in the majority for each surgical procedure. This study is not consensus to the present study, because of the multiple trends and limited sample size. Simple continuous suturing technique has advantages such as more water tight closure, distributes the tension uniformly, rapid technique and only two knots with associated tags are needed.

The students were also asked about the best suturing technique, where 75% responded as interrupted suturing technique, 15% as simple continuous suturing technique, 4% as horizontal mattress technique and 3 % as vertical mattress and criss cross suturing technique each (Figure 3). A study given by Eliason JA, et.al, 1990 (Eliason and McCulley, 1990), says that interrupted sutures are easy to place, have greater tensile strength, and have

less potential for causing wound edema and impaired cutaneous circulation. Interrupted sutures also allow the surgeon to make adjustments as needed to properly align wound edges as the wound is sutured.

Figure 4: Bar chart showing responses to the question, “Which one of the following do you think is the best suture material?”. X axis represents the best suture material in the opinion of dental students and Y axis represents the number of dental students participated in the survey. Majority of respondents reported “Natural”(32%). Blue indicates “Natural”, green indicates “ Synthetic”, violet indicates “Monofilament” and yellow indicates “Multifilament”

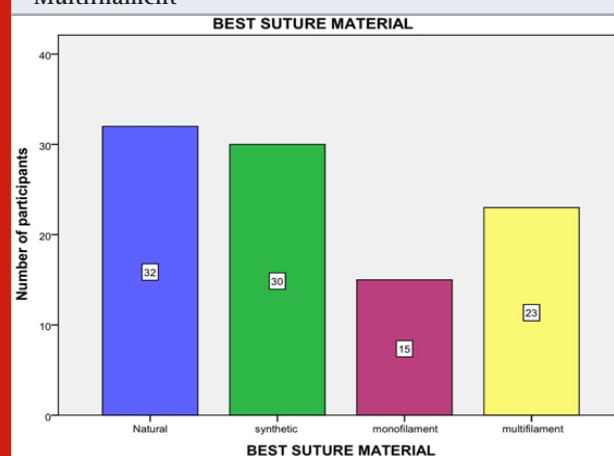
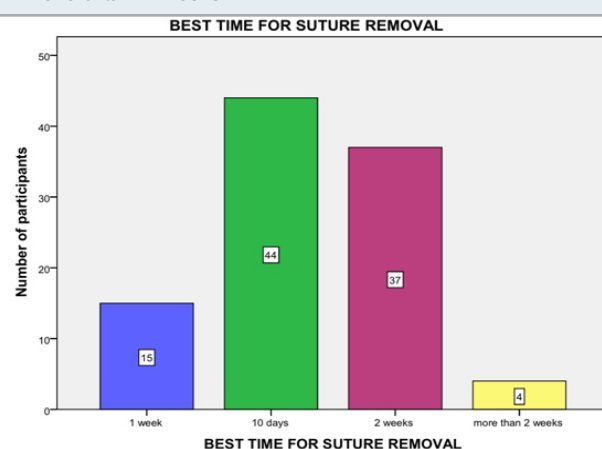


Figure 5: Bar chart showing responses to the question, “Which one of the following do you think is the best time for suture removal?”. X axis represents the best time for suture removal in the opinion of dental students and Y axis represents the number of dental students participated in the survey. Majority of respondents reported “10 days”(44%). Blue indicates “1 week”, green indicates “ 10 days”, violet indicates “ 2 weeks” and yellow indicates “more than 2 weeks”



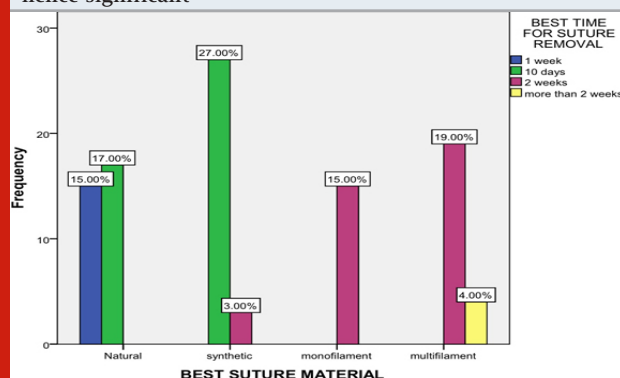
The students were asked regarding the best suture material in their opinion where 32% of students responded as natural followed by 30% as synthetic, 23% as multifilament and 15% as monofilament (

Figure 4). According to an article given by Teach me surgery, 2020 (Suture Materials - Classification - Surgical Needles - TeachMeSurgery, no date), The ideal suture is the smallest possible to produce uniform tensile strength, securely hold the wound for the required time for healing, then be absorbed. It should be predictable, easy to handle, produce minimal reaction, and knot securely. Suture made of natural fibers (e.g. silk or catgut) are not regularly used as they provoke more tissue reaction, but used for securing surgical drains. Synthetic sutures (e.g. PDS or nylon) are more predictable than the natural sutures, particularly in their loss of tensile strength and absorption. Multifilament sutures (e.g. braided silk or vicryl) are made of several filaments that are twisted together. They handle easier and hold their shape for good knot security, yet can cause infections. Monofilament sutures (e.g. nylon, prolene) have a lower risk of infection but also have a poor knot security and ease of handling.

The students were also asked about the best time for suture removal where 44% of the students responded as 10 days, 37% of them as 2 weeks, 15% as 1 week and 4% as more than 2 weeks (Figure 5). According to the study given by Alexander T. Trott MD, 2012 (Suture Removal and Wound Aftercare, 2012), the best time for suture removal is 8-14 days. After the removal of the suture, the patient should still continue to maintain the oral hygiene tips given after the surgery for 2-3 days.

When the correlation was done between the best suture material and best time for suture removal, 32% of them chose natural suture material and 27% of them think that the best time for suture removal is 10 days. The statistical Chi square test was done and the p value was 0.000 which is statistically significant (Figure 6).

Figure 6 - Bar graph showing the correlation between the best suture material and best time for suture removal. X axis represents the best suture material and Y axis represents the frequency of the number of dental students. Blue indicates 1 week, green indicates 10 days, violet indicates 2 weeks and yellow indicates more than 2 weeks. The graph shows that the best time for suture removal answered by the undergraduate dental students was 10 days. Chi square test was done and the association was found to be statistically significant. Pearson's value: 123.791, DF: 9, P value : 0.000 ( $P < 0.05$ ), hence significant



The correlation between best suturing technique and the best time for suture removal was done where 44% of the students think that 10 days is the best time for suture removal and the most prevalent suturing technique was interrupted suturing technique with 74%. The statistical Chi square test was done and the p value was 0.000 which is statistically significant (Figure 7).

Figure 7: Bar graph showing the correlation between the best suturing technique and best time for suture removal. X axis represents the best suturing technique and Y axis represents the frequency of the number of dental students. Blue indicates 1 week, green indicates 10 days, violet indicates 2 weeks and yellow indicates more than 2 weeks. The graph shows that the best time for suture removal answered by the undergraduate dental students was 10 days. Chi square test was done and the association was found to be statistically significant. Pearson's value: 123.872, DF: 12, P value : 0.000 ( $P < 0.05$ ), hence significant

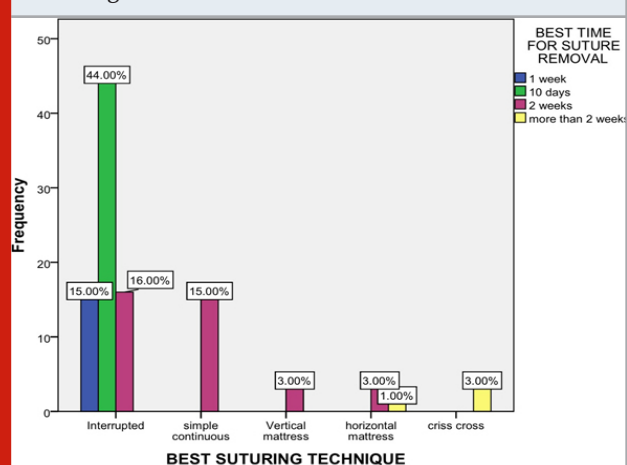
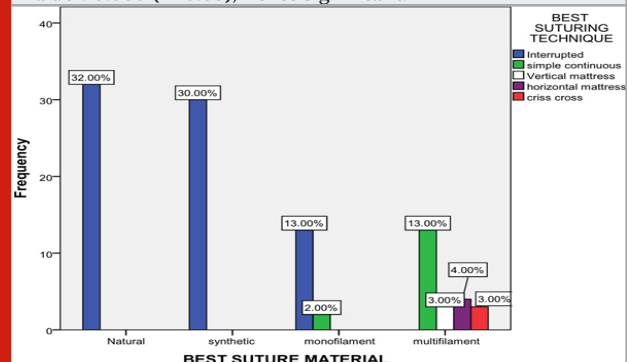


Figure 8: Bar graph showing the correlation between the best suture material and best suturing technique. X axis represents the best suture material and Y axis represents the frequency of the number of dental students. Blue indicates Interrupted, green indicates Simple continuous, white indicates vertical mattress, violet indicates horizontal mattress and red indicates criss cross. The graph shows the best suturing technique answered by the undergraduate dental students which was Interrupted suturing technique. Chi square test was done and the association was found to be statistically significant. Pearson's value: 91.930, DF: 12, P value : 0.000 ( $P < 0.05$ ), hence significant.





Also, the correlation between the best suture material and best suturing technique was done, where the Interrupted suturing technique showed the highest prevalence with 75% and natural suture material with 32%. The statistical Chi square test was done and the p value was 0.000 which is statistically significant (Figure 8).

## CONCLUSION

Within the limits of the study, the dental students were aware of the various suturing techniques used in minor oral surgeries. More awareness should be created among the students on the suturing materials, suturing techniques and suture removal as it helps in their dental practice. Similar studies on large populations should be done in order to get the relevant results. This study will act as a guide to understand the awareness of various suturing techniques used in minor oral surgeries among dental students.

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