

# Role Of Facial Reconstruction In Identification Using Software- Recent Advances- Survey Among Dental Students

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## Abstract

### Introduction:

Forensic facial reconstruction is the scientific art of visualising a face on the skull for personal identification. This technique may be highly useful when other efforts are unsuccessful in establishing the origin of unknown skulls.

### Aim:

The main aim of the study is to assess the knowledge and awareness of the role of facial reconstruction in identification using software among dental students.

### Materials and methods:

A survey based questionnaire was done to study the knowledge about the role of facial reconstruction in identification using software among dental students. A total questionnaire of 15 questions were collected by google form app. SPSS statistical analysis was done. A total of 100 participants participated in this survey.

### Result:

The results were collected and data were analysed. 54% of the participants were aware of the role of facial reconstruction in identification using software. The difference of the result is statistically significant( $p < 0.05$ ).

### Conclusion:

This study concludes that the majority of the participants were aware of the role of facial reconstruction in identification using software.

**KEYWORDS:** awareness, software, facial reconstruction, recent advances, dental students, innovative method

## INTRODUCTION:

Forensic facial reconstruction is the scientific art of visualizing a face on the skull for personal identification. This technique may be highly useful when other efforts are unsuccessful in establishing the origin of unknown skulls. To date, facial reconstruction has mainly been carried out by using sculpting and drawing techniques, taking into account anthropological findings, appropriate facial skin thickness and anatomical relation between a skull and facial

features(1). In Japan, the two-dimensional anatomical drawing method based on skull photographs is preferred as a practical method instead of the three-dimensional technique in clay(2,3).

Facial reconstruction has occasionally been useful for identifying an individual from the skull, nevertheless the validity of this technique as a guide to personal recognition has been questioned due to its high subjectivity, its requirement for artistic talent and so on(4). In order to solve the methodological problems, in recent times electronic imaging equipment has widely been applied to facilitating the technical procedure of facial reconstruction(5,6). Our has extensive knowledge and research experience that has translate into high quality publications (15)(16)(17)(18)(19)(20)(21)(22)(23)(24)(25)(26)(27)(28)(29)(30),(31)(31)(32)(33). The main aim of the present study is to evaluate the knowledge and awareness of the role of software in facial reconstruction among forensic odontologists.

## MATERIALS AND METHODS:

A convenient sample size of one hundred consecutive respondents participated during this study. A cross sectional observational online based study was conducted using Google forms with dichotomous response and multiple choice questions. The ethical approval was obtained from the Institutional Ethical Committee. The questionnaire contains 10 questions based on knowledge and awareness of the role of facial reconstruction in identification using software among dental students.

### STATISTICAL ANALYSIS:

The data were collected and entered in excel and then it is converted into SPSS software for statistical analysis. Descriptive analysis was done and the correlation of data was carried out using Chi-square test.

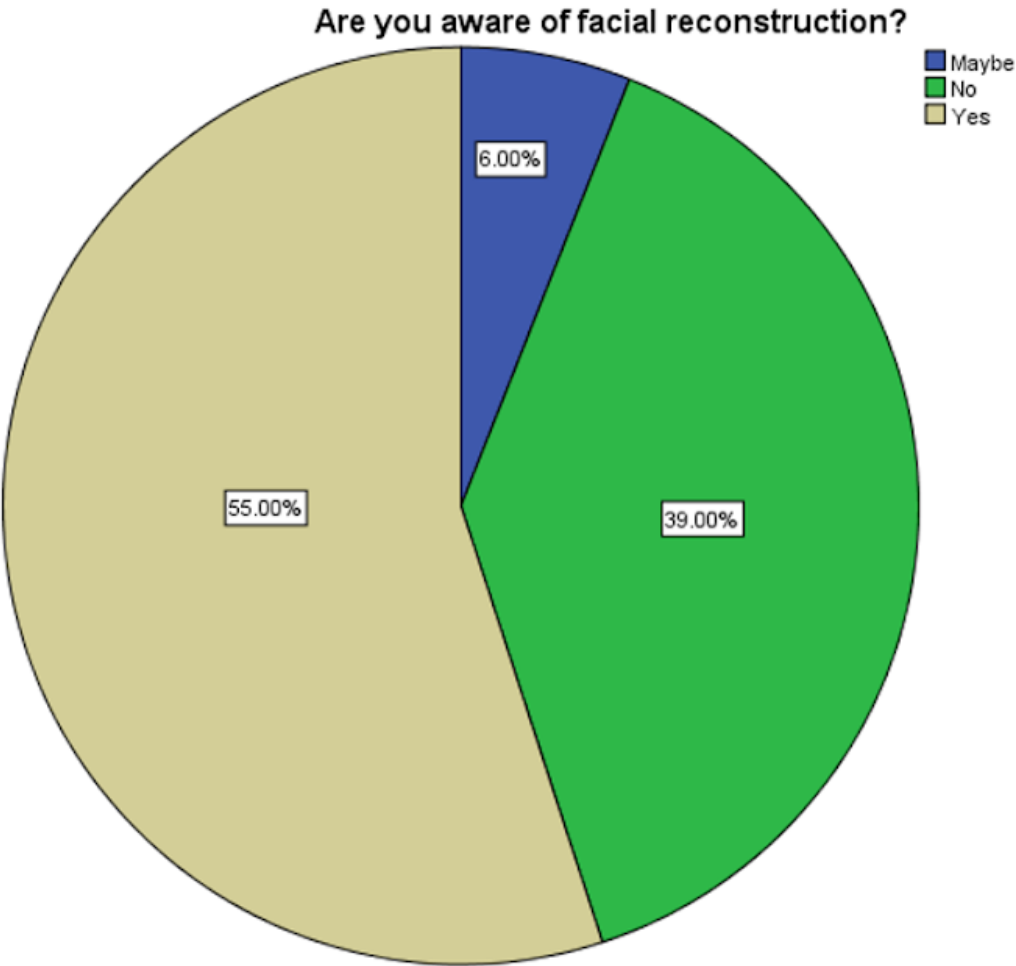
## RESULT :

**Table 1:** Responses of the questionnaire.

S.No.	Questions	Choices	Responses
	Gender?	Male Female	53 % 47 %
	Year of study?	1st year 2nd year 3rd year 4th year	5 % 72 % 7 % 16 %
	Are you aware of facial reconstruction?	Yes No Maybe	55 % 39 % 6 %

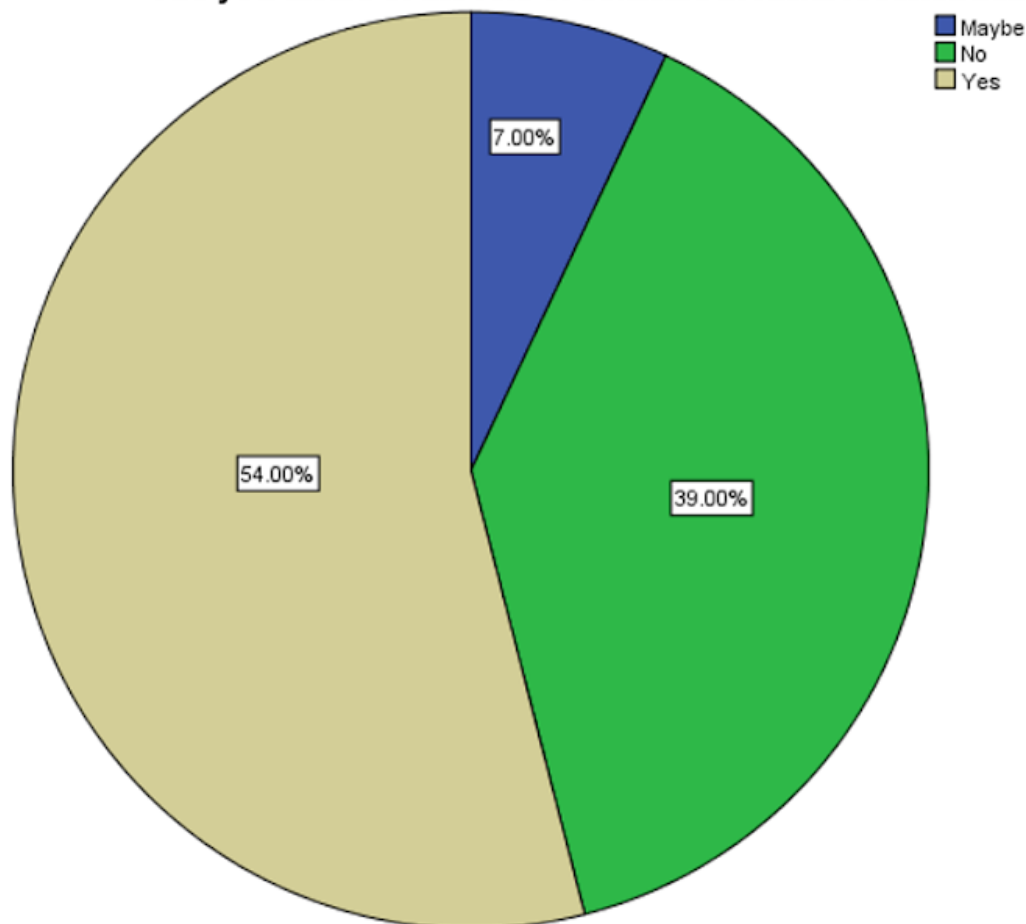
	Are you aware of the role of software in facial reconstruction?	Yes No Maybe	54 % 39 % 7 %
	When was computerised facial reconstruction invented?	1970s 1980s 1990s 2000s	7 % 70 % 6 % 17 %
	Advantages of computerised facial reconstruction?	High level of efficiency High level of flexibility High level of objectivity All the above	21 % 18 % 7 % 54 %
	What are the technologies used in computerised facial reconstruction?	CCFR Computer tomography CT scan All the above	6 % 7 % 16 % 71 %
	Do you think computerised facial reconstruction is beneficial?	Yes No Maybe	66 % 17 % 17 %
	Which method is more accurate in facial reconstruction?	3D facial reconstruction 2D facial reconstruction Computerised facial reconstruction	39 % 7 % 54 %

<b>10.</b>	Which method of facial reconstruction would be quick and efficient?	3D facial reconstruction	34%
		2D facial reconstruction	7%
		Computerised facial reconstruction	59%
<b>11.</b>	Do you think computerised facial reconstruction has future scope?	Yes	61%
		No	34%
		Maybe	5%

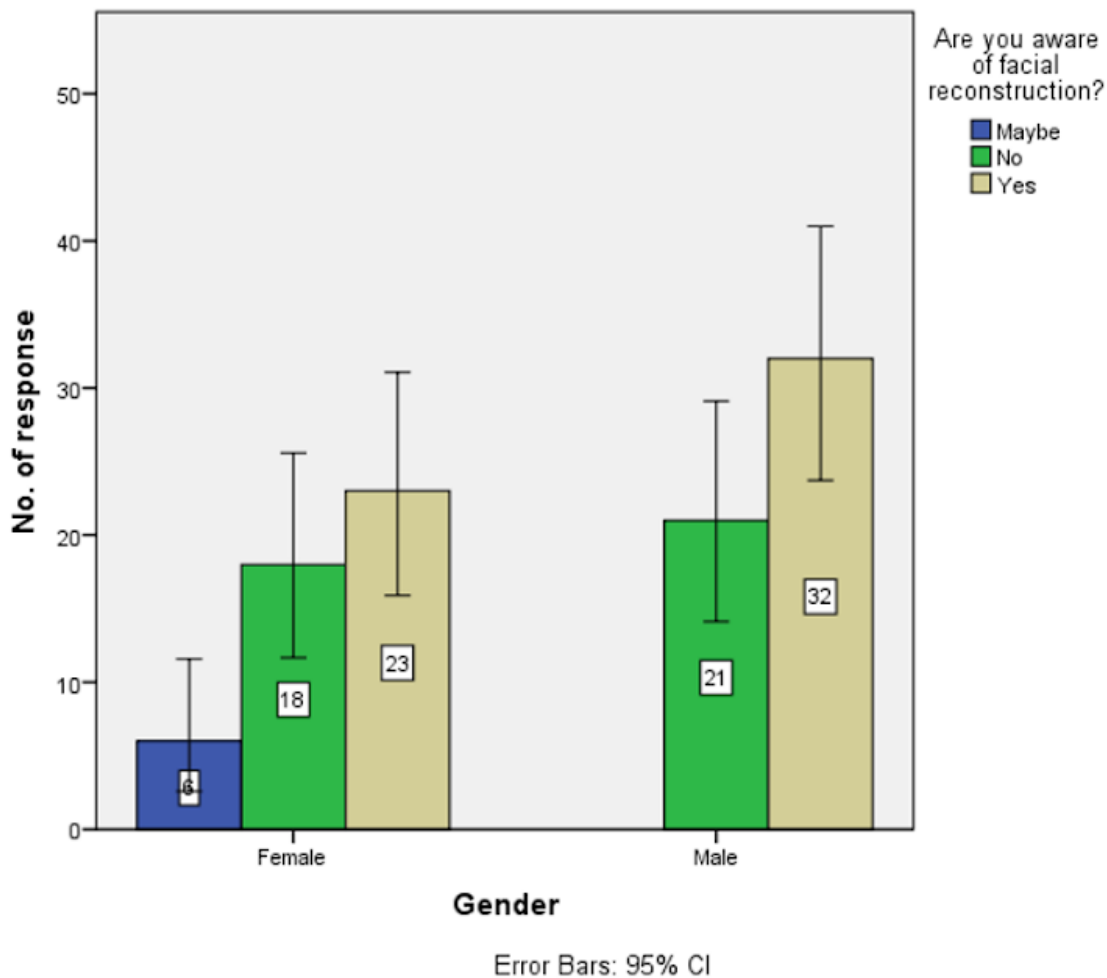


**Figure 1:** Shows the response of the awareness of facial reconstruction of the participants. 55% participants chose yes, 39% participants chose no, 6% participants chose maybe. Beige indicates yes, green indicates no and blue indicates maybe.

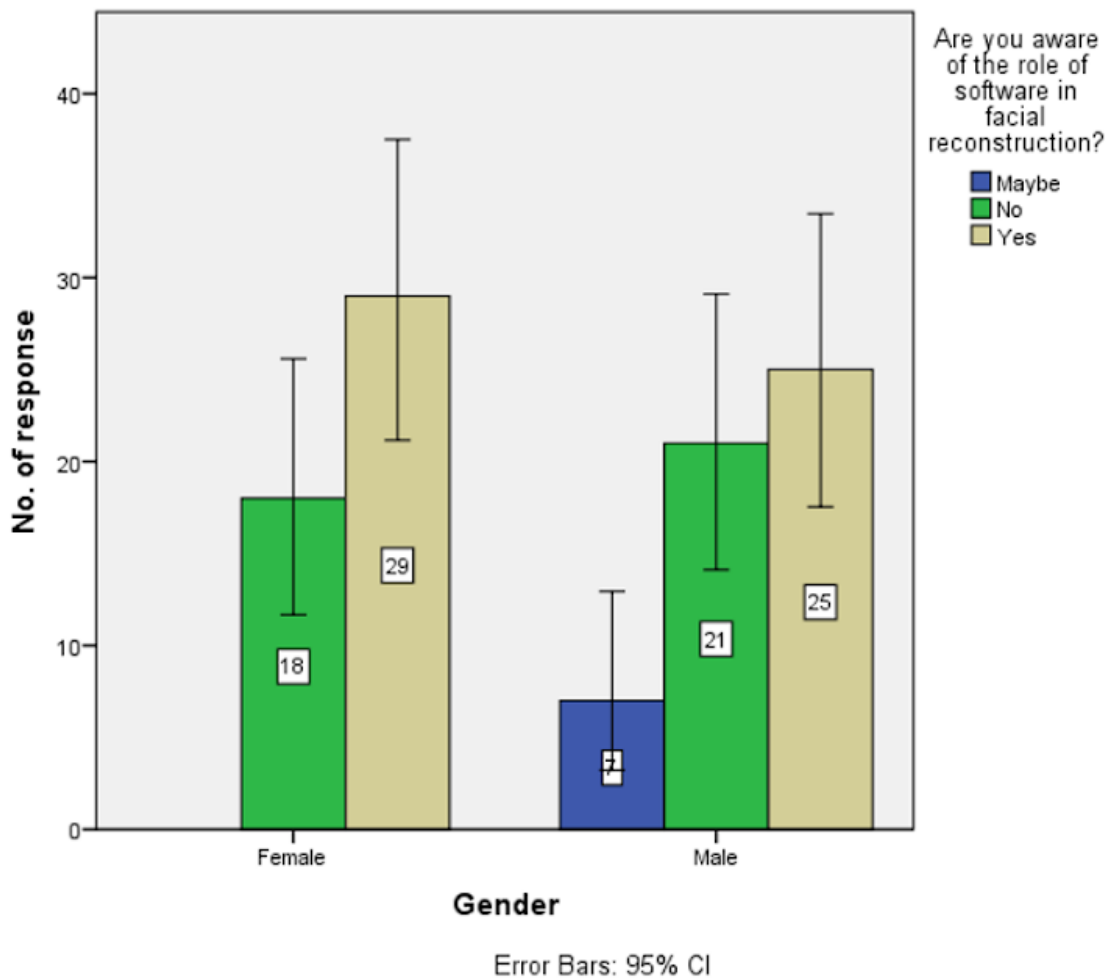
Are you aware of the role of software in facial reconstruction?



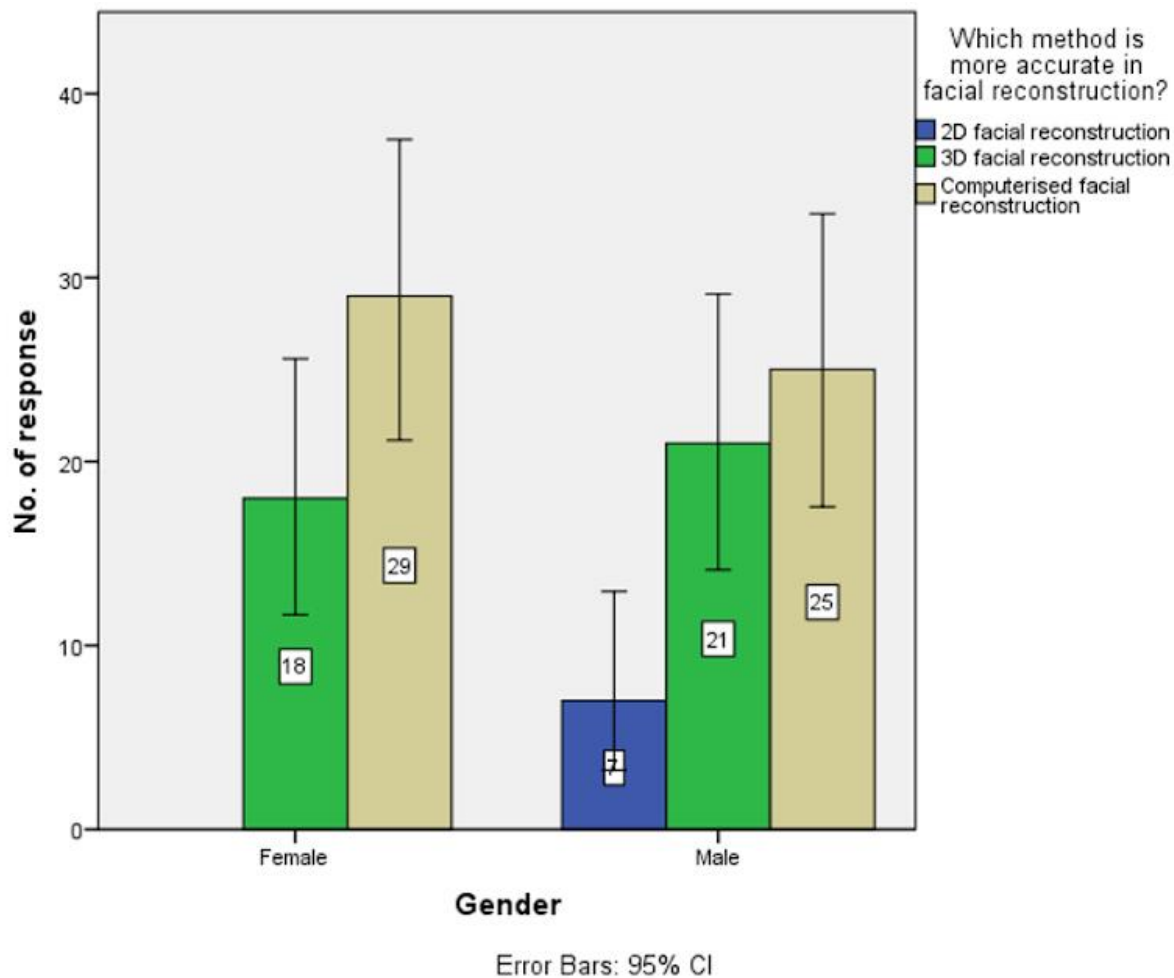
**Figure 2:** Shows the responses of the awareness of the role of software in facial reconstruction among the participants. 54% participants chose yes, 39% participants chose no and 7% participants chose maybe. Beige indicates yes, green indicates no and blue indicates maybe.



**Figure 3:** Bar graph showing the association between gender and the awareness of facial reconstruction. X-axis represents the gender and Y-axis represents the number of participants of which beige colour indicates yes and green colour indicates no and blue colour indicates maybe. Majority of the males (32 participants) were more aware of facial reconstruction than females. However the difference is statistically significant (Chi-square value-7.370 , p value-0.025 (<0.05) hence significant).

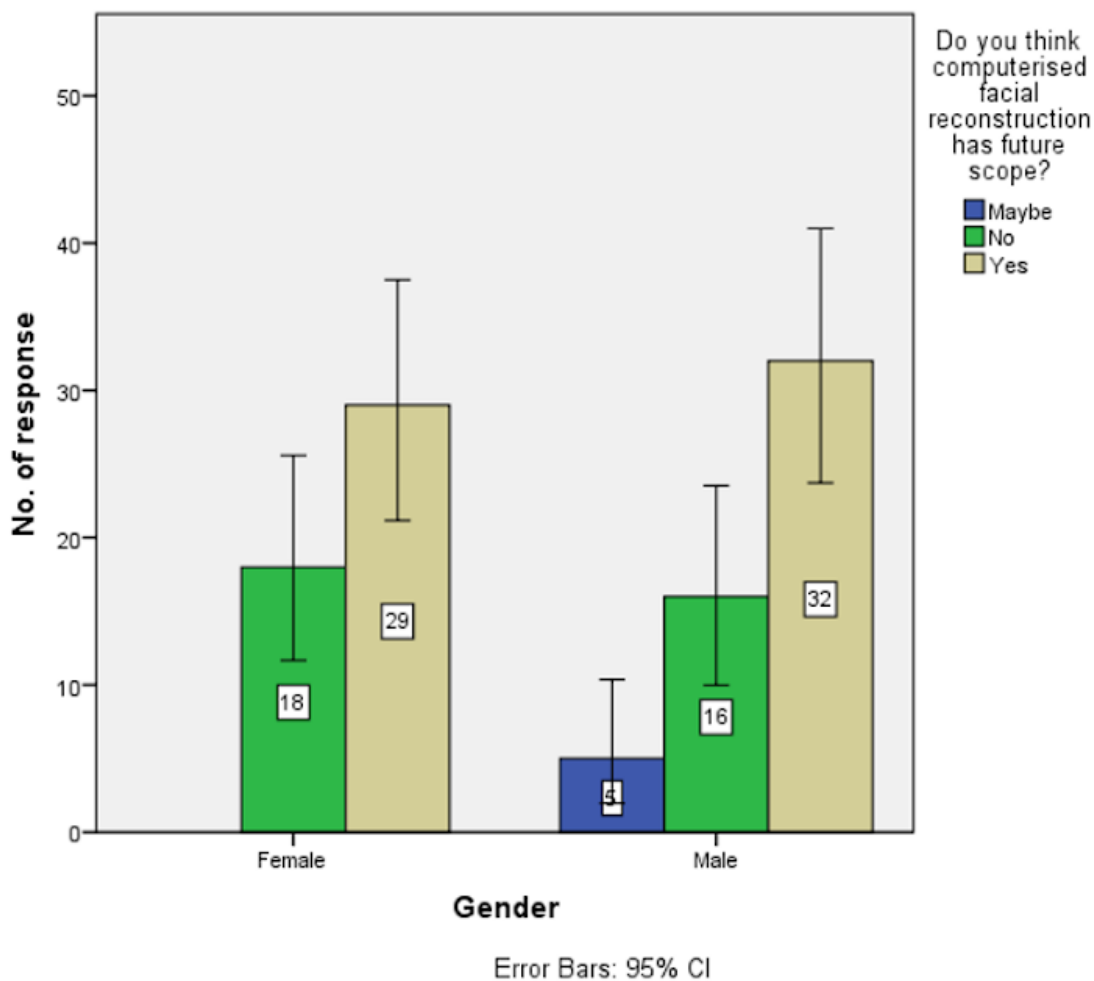


**Figure 4:** Bar graph showing the association between gender and the awareness of the role of software in facial reconstruction. X-axis represents the gender and Y-axis represents the number of participants of which beige colour indicates yes and green colour indicates no and blue colour indicates maybe. Majority of the females (29 participants) were more aware of the role of software in facial reconstruction than males. However the difference is statistically significant (Chi-square value-7.193 , p value-0.027 (<0.05) hence significant).



**Figure 5:** Bar graph showing the association between gender and the accurate method in facial reconstruction. X-axis represents the gender and Y-axis represents the number of participants of which beige colour indicates computerised facial reconstruction and green colour indicates 3D facial reconstruction and blue colour indicates 2D facial reconstruction. Majority of the females (29 participants) were more aware that computerised facial reconstruction is the accurate method of facial reconstruction than males. However the difference is statistically significant (Chi-square value-7.193 , p value-0.027 (<0.05) hence significant).





**Figure 6:** Bar graph showing the association between gender and the awareness of facial reconstruction has future scope. X-axis represents the gender and Y-axis represents the number of participants of which beige colour indicates yes and green colour indicates no and blue colour indicates maybe. Majority of the males (32 participants) were more aware that facial reconstruction has future scope than females. However the difference is not statistically significant (Chi-square value-4.923 , p value-0.085 (>0.05) hence not significant).

## DISCUSSION:

The results were collected and the data were analysed. A total of 100 students completed the survey questionnaire. Majority of the participants were males and studying 2nd year. There was a remarkable knowledge of the role of software in facial reconstruction. From table 1, 55% of the participants were aware of facial reconstruction (figure 1). 54% of the participants were aware of the role of software in facial reconstruction (figure 2). 70% of the respondents thought that the computerised facial reconstruction was invented in the 1980s. 21% of the respondents chose high level of efficiency as the advantages of computerised facial reconstruction, 18% of participants chose high level of flexibility, 7% of participants chose high level of objectivity and 54% of respondents chose all the above. 16% of the participants chose CT scan as the technology used in computerised facial reconstruction, 7% of participants chose computer tomography, 6% of participants chose CCFR and 71% of the participants chose all the above. 66% of the participants thought that computerised facial reconstruction is beneficial. 54% of the participants chose a computerised facial reconstruction method that is more accurate in facial reconstruction. 59% of the participants chose computerised

facial reconstruction method as the quick and efficient method of facial reconstruction. 61% of the participants thought that computerised facial reconstruction has future scope.

From the graph, the majority of the males (32 participants) were more aware of facial reconstruction than females. However the difference is statistically significant (Chi-square value-7.370 , p value-0.025 (<0.05) hence significant)(figure 3). Majority of the females (29 participants) were more aware of the role of software in facial reconstruction than males. However the difference is statistically significant (Chi-square value-7.193 , p value-0.027 (<0.05) hence significant)(figure 4). Majority of the females (29 participants) were more aware that computerised facial reconstruction is the accurate method of facial reconstruction than males. However the difference is statistically significant (Chi-square value-7.193 , p value-0.027 (<0.05) hence significant)(figure 5). Majority of the males (32 participants) were more aware that facial reconstruction has future scope than females. However the difference is not statistically significant (Chi-square value-4.923 , p value-0.085 (>0.05) hence not significant)(figure 6).

In previous studies, authors claim that multiple versions of the same face can be created quickly and efficiently(7), but many 3D modeling systems require the same amount of time to reproduce alternative faces(8), and the addition of color and texture to a 3D computer model can be extremely time consuming(9). The 2D systems do produce multiple versions of the same face quickly and efficiently(10), but only a single view is produced and 3D information regarding the face is omitted(11). However, there are many benefits to computer-based facial reconstruction/approximation systems. When the skull is fragmented, some computerized systems allow skull reassembly, and this is much more efficient and rapid than manual re-assembly, as no support mechanisms are necessary(12). Computerized remodeling of missing fragments is also significantly easier than using manual methods and may reduce the amount of necessary time from days to hours(13). Computerized systems also allow a more realistic resulting facial appearance than the manual methods, creating familiar images consistent with photographs or film sequences(14).

The present study has some limitations like the study population like small sample size as there were only 100 participants. We could increase awareness and let people understand the recent advances in identification of facial reconstruction.

## CONCLUSION:

Within the limitations of this study it is evident that most of the dental students were aware of the role of facial reconstruction in identification using software. This survey brings about epidemiological significance about the knowledge and awareness of the role of facial reconstruction in identification using software among dental students.

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## CONFLICT OF INTERESTS:

The authors declare no conflict of interest.

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