

A Retrospective Study on the Assessment of Retention and Relapse in Patients Undergoing Orthodontic Therapy

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Abstract:

Retention is considered as an important phase at the end of any active or fixed orthodontic tooth movement. Aim of the study is to assess the retention and relapse in patient's who are undergoing orthodontic therapy . A retrospective study with a sample size of 360 patient's who underwent fixed appliance therapy was obtained and segregated. Data collection was done from 86,000 patient's reports. The collected data was entered in Excel and tabulated in SPSS version 19 and results were obtained using chi-square test.Based on the results obtained females more commonly underwent orthodontic therapy than males (55.8% versus 46.1%). 50.8% of the patient's who underwent treatment was in 10 to 20 years age group followed by 33.05% of patient's from 20 to 30 years age group and 16.1% of patient's aged between 30 to 40 years.Within the limitations of the current study we observed that females most commonly underwent orthodontic therapy than males. Most common age group was found to be 10 to 20 years. The number of patient's who wore retainers after orthodontic therapy(76.1%) was more compared to the patient's who did not wear retainers(23.89%).The relapse rate in patient's who underwent orthodontic therapy was 18.89% and 81.1% of patient's who underwent orthodontic therapy did not have relapse post treatment phase.

Keywords: Appliance fixed orthodontic treatment ;relapse;retainers;patients.

INTRODUCTION

Retention procedures are considered to be important to maintain the corrected position of the teeth following fixed appliance therapy and to prevent the characteristic age related changes, which if not checked can cause mandibular anterior crowding (Horowitz and Hixon, 1969). The duration of wear of orthodontic retainers has long been a dilemma in orthodontics. There is a wide acceptance for retainers to minimise both relapse and maturational changes (Case, 2003; Valiathan and Hughes, 2010)

Usage of retainers for longer period of time can lead to risk of the periodontium and dental hard tissue therefore it is important for regular follow-up of patient's who are under retention phase (Littlewood et al., 2006, 2016; Westerlund, 2014)as fixed and removable retainers are prone for breakage, loss and degradation (Booth et al., 2008; Sun et al., 2011).After orthodontic treatment there is a continuous risk that the position of the teeth throughout life due to inheritance/genetics and aging processes (Thilander, 2000). Many studies have tried to find predictors of

stability without success. A review article from 2006 concludes that most malocclusions are unstable after treatment in the long-term and that stability is unpredictable at the individual level (Bondemark et al., 2007).

Breakage is more common and there is a need to replace retainers which in turn have increased the cost effectiveness but there is a limited evidence for cost-effectiveness (Hichens et al., 2007; Tynelius et al., 2014).Previously our team had conducted numerous clinical trials (Das et al., 2018; Felicita, 2017b; Krishnan, 2015; Ramanathan and Solete, 2015; Samantha et al., 2017; Vikram et al., 2017; Viswanath et al., 2015) and lab animal studies (Felicita, 2017a; Jain, 2014; Ramesh Kumar et al., 2011; Rubika et al., 2015; Samantha et al., 2017)and in vitro studies over the past 5 years. (Dinesh and Saravana Dinesh, 2013; Felicita, 2018; Felicita et al., 2012)

The purpose of the current study was to assess the retention and relapse in patients who are undergoing orthodontic therapy and to create an awareness and

knowledge about the importance of retainers after orthodontic therapy.

MATERIALS AND METHODS

Study setting and sampling - This study is a single-center retrospective study, carried out in the Orthodontic department in a private dental college. The present study was approved by the ethical board of the institution – Institutional ethical committee [IEC](Ethical approval number: SDC/SIHEC/2020/DIASDATA/0619-0320)and was in accordance with the ethical standards that were stipulated. All available records of patients who underwent orthodontic therapy from June 2019 – April 2020, were examined and included in our data collection. A total of 360 case sheets were reviewed. Cross verification of data for error was done by presence of additional reviewers and by photographs evaluation. Two examiners were involved in the study. Patients who underwent orthodontic therapy and retainer therapy were included and patients who were aged below 10 years were excluded.

Data collection- Acquisition of data was done from the hospital digital database which records all patient details. The collected data were grouped based on their age,gender,patients who wore retainers,patients who did not wear retainers,patients who had relapse and patients who did not have relapse. The data were entered in the system in a methodical manner. For this study, data on the number of patients who underwent orthodontic therapy ,retainer therapy and clinical variables such as their age, gender,relapse were collected. The data was then entered in excel manually and imported to SPSS for analysis. Incomplete or censored data were excluded from the study.

Statistical analysis - The statistical analysis was done using SPSS software (SPSS version 21.0, SPSS,

Chicago II, USA).Descriptive statistics were used to summarize the demographic information of the patients included in this study. Descriptive statistics is used for the acquisition of frequency distribution of the data for age and gender. Association of retention and relapse in patients undergoing orthodontic therapy was analysed using a chi- square test. The p value of less than 0.05 was considered to be statistically significant.

RESULT AND DISCUSSION

From the results obtained it is shown that, the commonest age group was 10 to 20 years. Majority of females 26.39% patient's within the age group of 10-20 years underwent orthodontic treatment than males. 38.8% of female patient's underwent retainer therapy post orthodontic therapy. Majority of female patient's 43.3% did not have relapse post orthodontic therapy. Majority of patient's aged from 10-20 years 44.7% of patient's wore retainers post orthodontic therapy. Patient's aged from 10-20 years 43.0% of patient's did not have relapse post orthodontic therapy. Majority of patients who wore retainers had no relapse 66.6%.

Almuqbil S, conducted a study on patients compliance and reasons for non-compliance with removable retainers and he said that 18-25 years patients where more commonly getting fixed appliance therapy. This study is in accordance with the present study as our study showed prevalence in the age group of 10 to 20 years (67.5%). (Banabilh and Almuqbil, 2019)

Meade ,et al, did a study on social perceptions of orthodontic retainer wear and he concluded that prevalence of males was higher for fixed appliance therapy. This study is not in accordance with the present study our study showed female prevalence 55.8%. (Meade et al., 2014)

Mirzakuchaki B, did a study on assessment of factors affecting adolescent patients compliance with Hawleys and vacuum for formed retainer. And he came to a conclusion that there is no difference between gender who are under treatment. Whereas our present study shows female prevalence (Mirzakouchaki et al., 2016).

Thus the current study is in accordance with the previous literature . This evidence adds to the consensus and can be used in clinical practice. The study population was found to be limited to a larger sample size and long-term follow-ups may be helpful to improvise the study.

CONCLUSION

Within the limitation of the current study, we observed that females underwent orthodontic therapy more commonly than males, most common age group was found to be 10 to 20 years. The number of patient's who wore retainers after fixed appliance therapy was more than the patient's who did not wear retainers. So it can be concluded that there was a significant difference between retention and relapse in patients undergoing orthodontic therapy.

AUTHOR CONTRIBUTIONS:

Jaya keerthana carried out the retrospective study, planning the study design, collection and analysis of data and drafted the manuscript. Dr. Maragathavalli and Dr. Remmiya aided in conception of the topic, supervision and appraisal of the manuscript.

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CONFLICT OF INTEREST - The authors have no conflict of interest.

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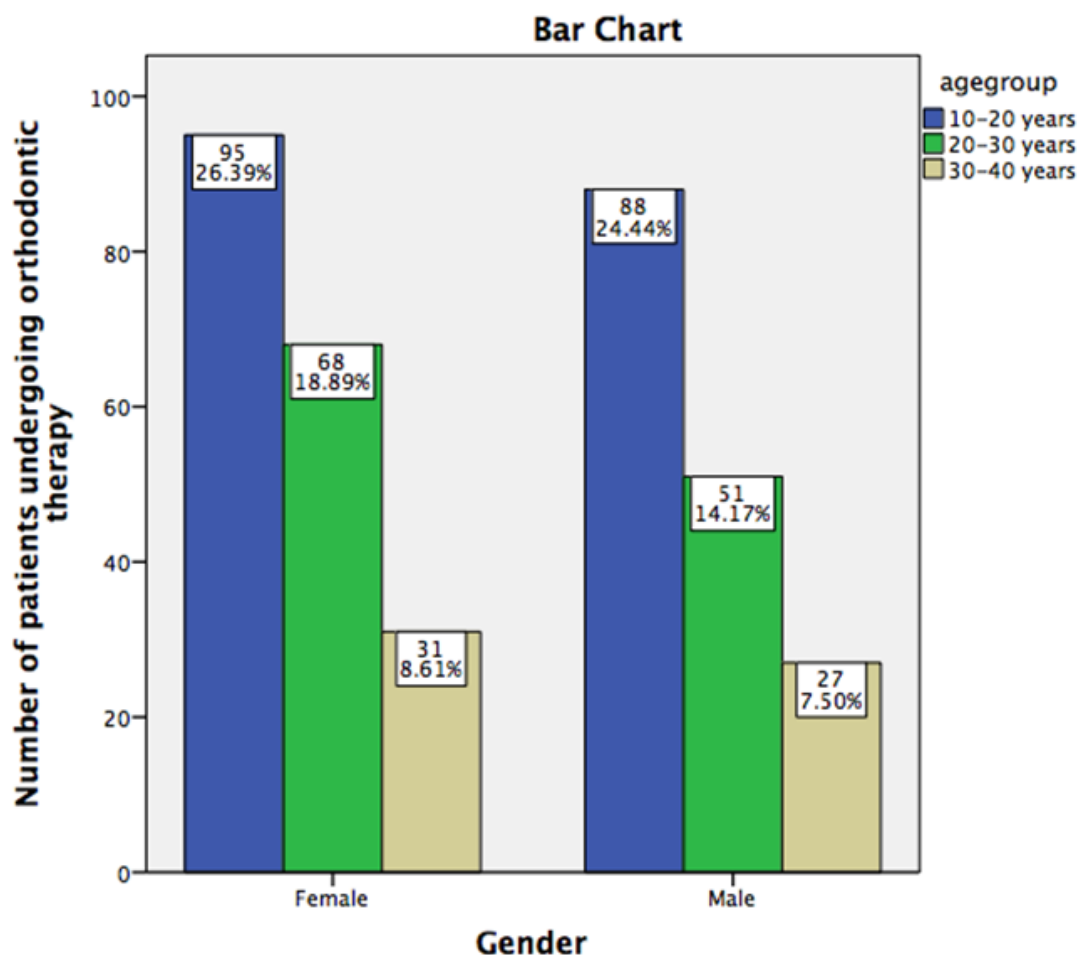


Figure 1: The bar graph represents association between different age groups and gender of patients undergoing orthodontic therapy. X axis represents gender and Y axis represents the number of patients. Majority of females 26.39% patient's within the age group of 10-20 years (blue) underwent orthodontic treatment .Chi square test was done [Chi square value-0.799 and p value - 0.671 ($p > 0.05$)]showing there is no statistically significant difference between the age group and gender.

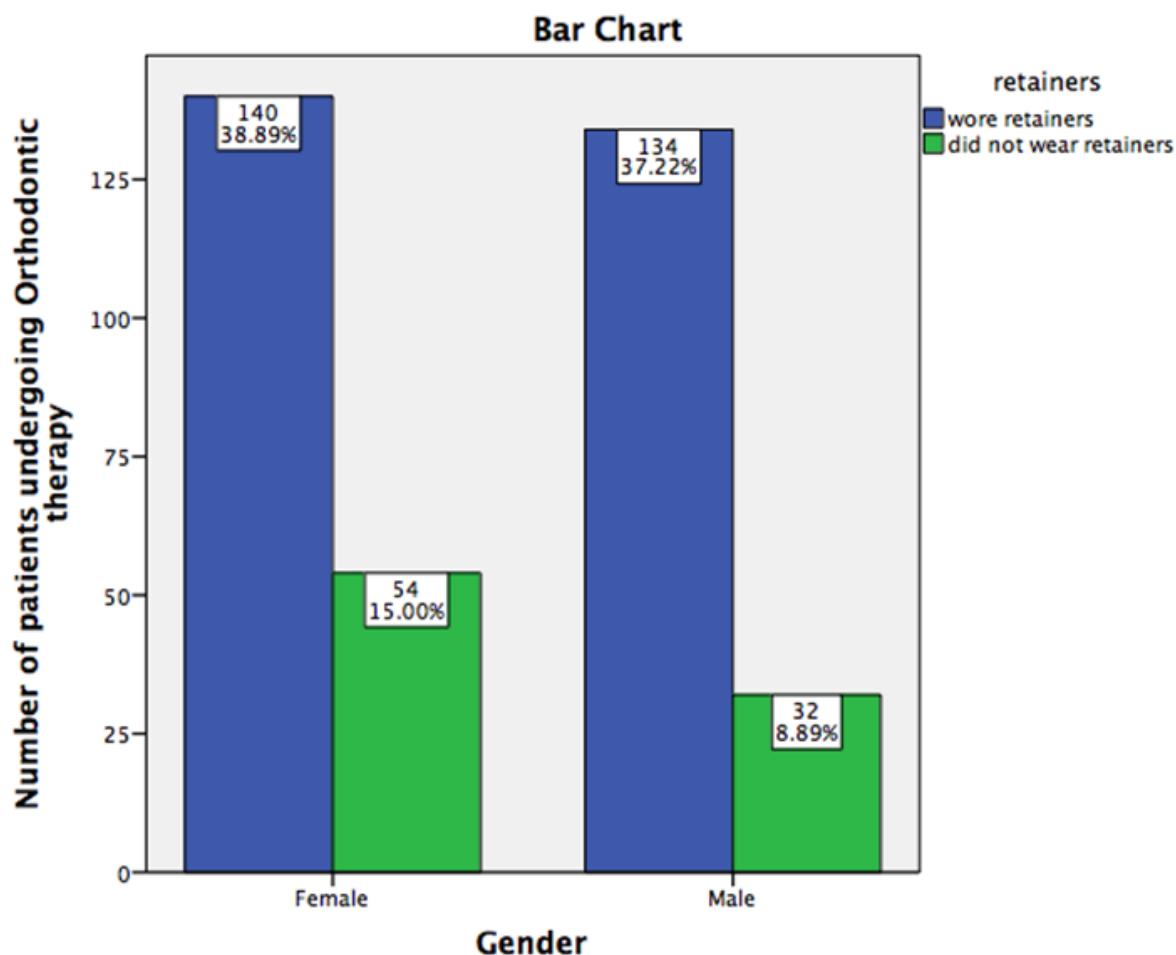


Figure 2 : The bar graph represents association of gender and retainer therapy of patient's undergoing orthodontic therapy. X axis represents gender and Y axis represents the number of patients undergoing orthodontic therapy. It depicts that 38.8% of female patient's underwent retainer therapy (blue) post orthodontic therapy. Chi square test was done [Chi square value-3.603 and p value - 0.063 ($p > 0.05$)] showing there is no statistically significant difference between the gender and retainer therapy.

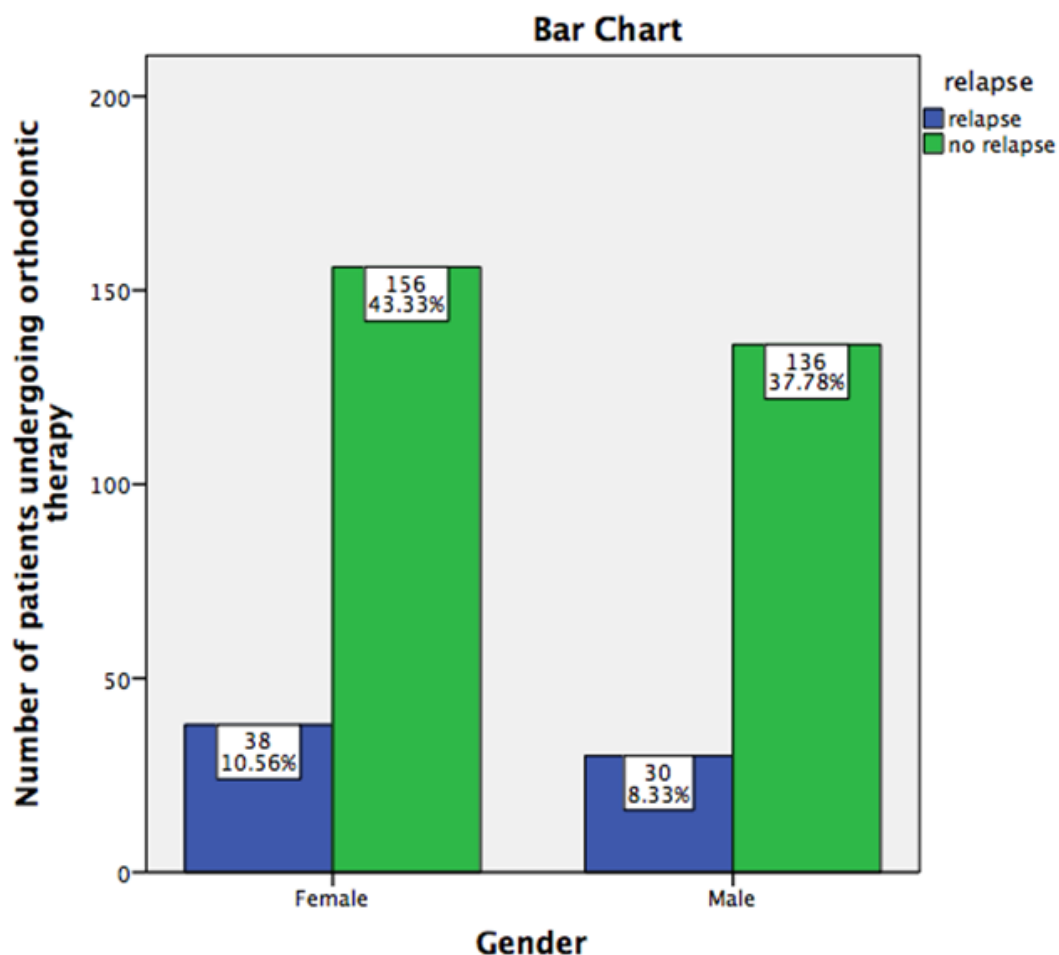


Figure 3 -The bar graph represents association of gender and relapse of patient's undergoing orthodontic therapy . X axis represents gender and Y axis represents the number of patient's undergoing orthodontic therapy .It depicts that 43.3% of female patient's did not have relapse(green) post orthodontic therapy.Chi square association test was done [Chi square value-0.134 and p value - 0.714 ($p > 0.05$)]showing there is no statistically significant difference between the gender and relapse.

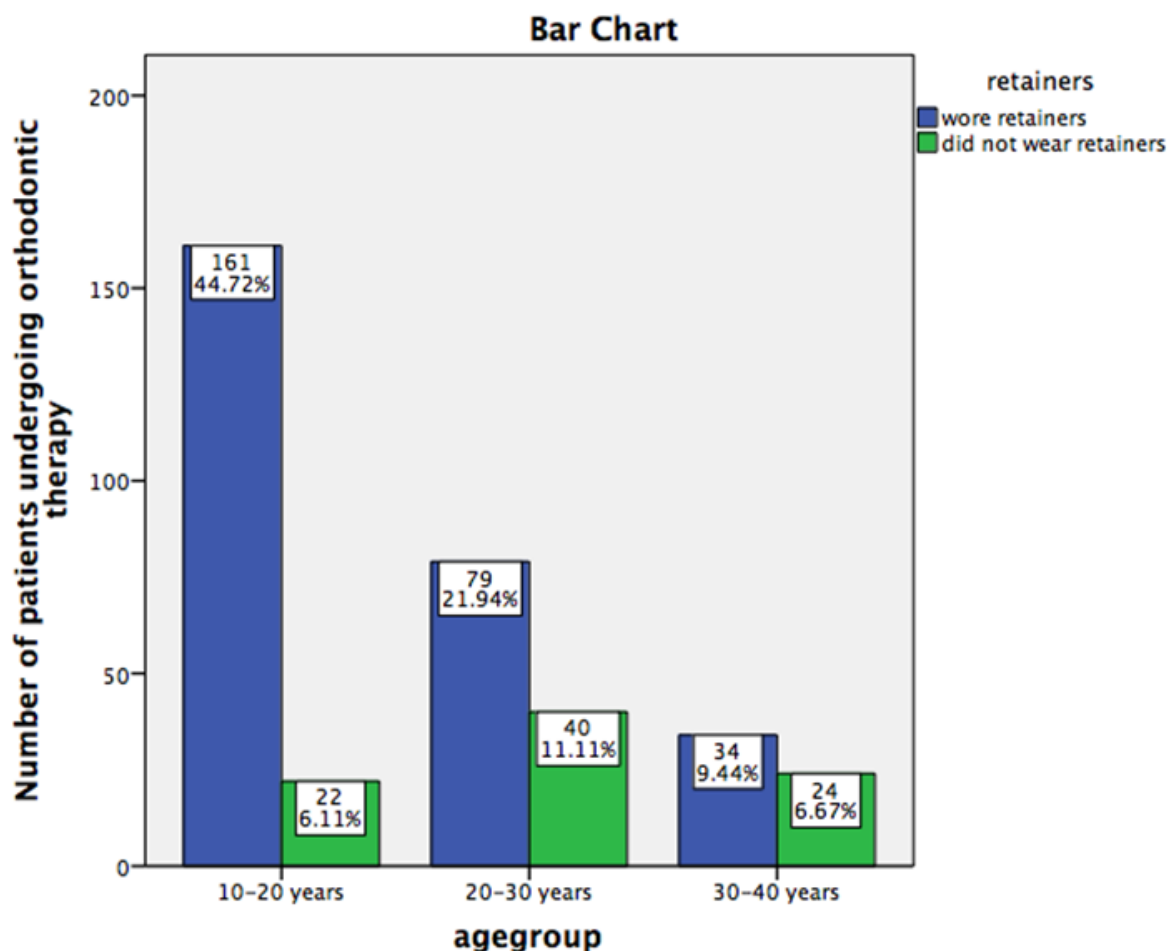


Figure 4 -The bar graph represents association of age and retainer therapy of patient's undergoing orthodontic therapy. X axis represents age group and Y axis represents the number of patient's. It depicts that majority of patient's aged from 10-20 years 44.7% of patient's wore retainers (blue) post orthodontic therapy. Chi square test [Chi square value-30.122 and p value - 0.00 ($p < 0.05$)] showing there is statistically significant difference between the age and retainer therapy.

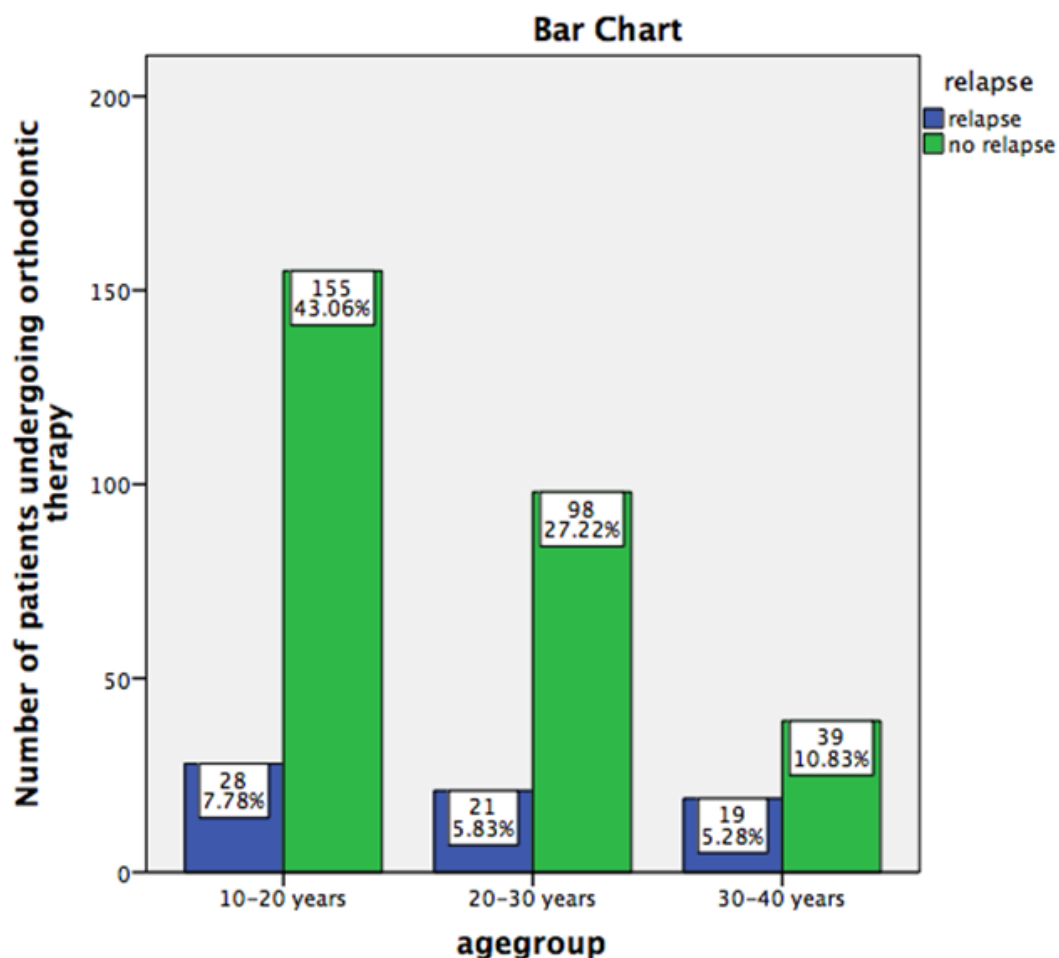


Figure 5 -The bar graph represents association of age and relapse of patient's undergoing orthodontic therapy .X axis represents age group and Y axis represents the number of patient's.It depicts that in patient's aged from 10-20 years 43.0% of patient's did not have relapse(green) post orthodontic therapy.Chi square test was done [Chi square value-8.940 and p value - 0.01($p < 0.05$)]showing there is statistically significant difference between the age and relapse.

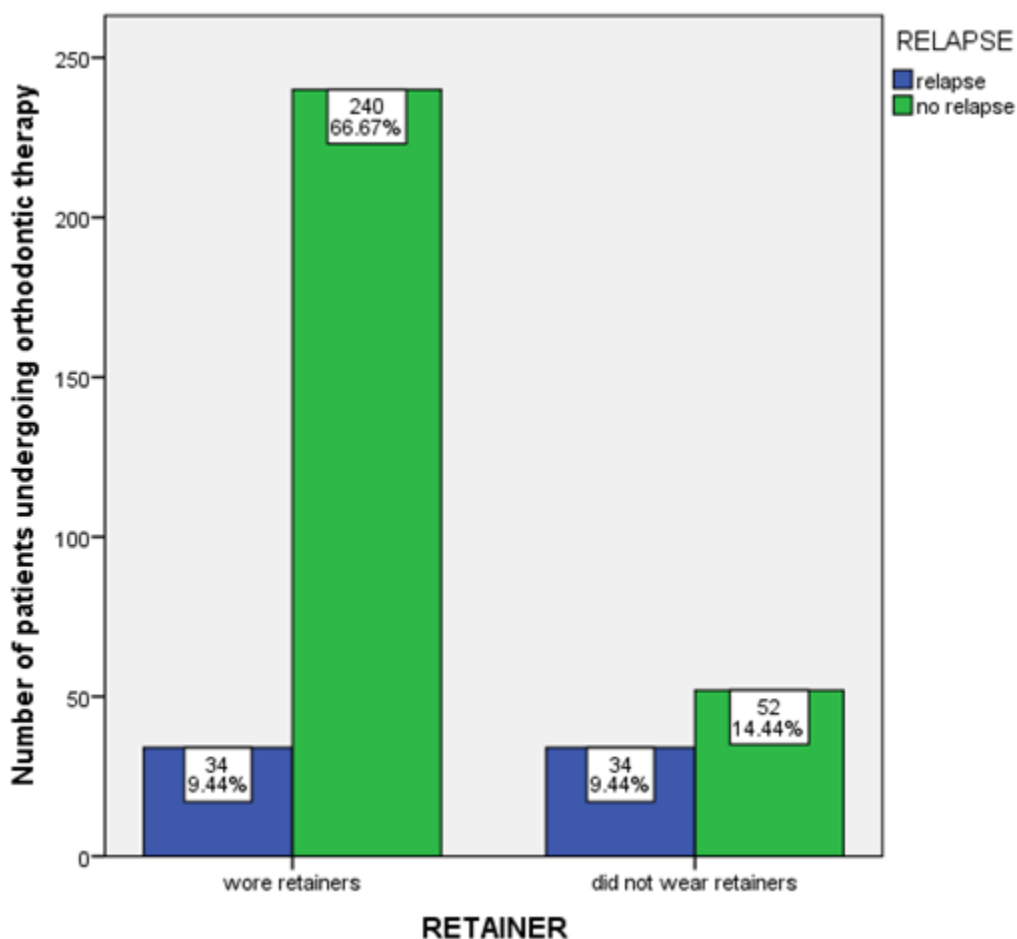


Figure 6 -The bar graph represents comparison of retention and relapse in patient's undergoing orthodontic therapy .X axis represents patient's who wore retainers and who did not wear retainers and Y axis represents the number of patient's.Majority of patients who wore retainers had no relapse 66.6% (green).Chi square association test was done [Chi square value-31.437 and p value - 0.000($p < 0.05$)]showing there is statistically significant difference between retention and relapse.