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### RESEARCH ARTICLE

#### PREDICTING FACTORS OF ORTHODONTIC PAIN – A SURVEY.

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##### Key words:-

Pain, patient, perception, discomfort, adaptation.

#### Abstract

**Aim:** To evaluate pain and discomfort experience by patients undergoing orthodontic treatment with different appliances after insertion and factors associated with orthodontic pain and to determine the factors associated with orthodontic pain and its effects on the quality of life of patients.

**Background:** Fear of pain during dental treatment is one of the major factors which prevent a patient from seeking orthodontic treatment. Pain and discomfort are commonly associated with orthodontic movement of teeth. Studies have shown that approximately 95% of orthodontic patients complained of pain during orthodontic treatment with 10% interrupting their treatment due to pain experienced during treatment. Pain is highly subjective as it may differ from one patient to another, in which some patients experience high levels of pain while others complain of just mild discomfort. It is very important for dentists to follow the progress of adaptation after insertion of new appliances and examine any pain or discomfort experienced by the patients.

**Materials and Methods:** A questionnaire-based study was done among dental students, practitioners and patients. A total of 100 participants took part in the survey. The participants were divided into 2 groups, Group 1 and 2. Group 1 consists of dental students and practitioners while Group 2 consists of dental patients. Each group was provided with a list of 10 questions related to pain during orthodontic treatment. Data was collected and statistic analysis was done.

**Results:** Moderate pain is most probably experienced by patients (62%). Sensory perception of intensity and discomfort is considered as the main factor (52%). Mold pain is commonly reported (44%). Most cases begin within 24 hours (64%) and usually subside within 24 hours (45%). Pain sensitivity is commonly associated with orthodontic pain (44%). Tests on anxiety level and dental fear is usually preferred (52%). Patient's compliance remains good (36%). NSAIDs is the best treatment of orthodontic pain (64%). Patients are well-informed of the whole procedure (82%).

8 is the moderate score of orthodontic pain (56%). Patients experience pain within 2 to 3 days (72%) with complains of moderate pain (94%). Most patients are relaxed and calm before treatment (78%) and some without negative experiences with dental procedure previously (76%).

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Patients are aware of possible pain and discomfort (86%). Some are prone to react to pain (74%) although most are well informed of the whole procedure (80%). Patients are still willing to proceed with the treatment despite having pain or discomfort.

**Conclusion:** Orthodontic pain has always been a great concern for most dentists all over the world. It is very important for every dentist to have a basic knowledge and understanding of orthodontic pain in order to overcome this condition in a clinical setting.

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## ..... **Introduction:-**

Pain and discomfort are the two common conditions experienced by most orthodontic patients, which may occur up to a certain degree during a treatment procedure. Despite the recent advancement in orthodontics, most patients still experience some pain or discomfort associated with orthodontic treatment, especially 3 to 5 days after the placement of appliances. It has been reported that about 90% of patients complained of mild to severe acute pain at some stage during their orthodontic treatment.<sup>[1, 2]</sup>

A report by the University of Mainz in Germany stated that patients normally begin to show adaptation to pain and discomfort with significant reduction in the number of complaints after 3 to 5 days following the placement of appliances. Patients rarely show further difference after the adaptation phase.<sup>[3]</sup> The severity of pain and discomfort in these patients are much higher in those with functional or fixed appliances compared to patients with removable appliances. Some orthodontic patients may experience less pain and fast adaptation, while others may suffer great pain and slow adaptation, following a course of orthodontic treatment. Anxious patients and those with a history of chronic pain experience greater pain as compared to those with lower anticipation for pain after the treatment.<sup>[4]</sup> Patients also complain of slurred speech, difficulty in swallowing and low self-confidence in public, mainly due to their appearance.

Various factors need to be considered in determining the main cause of orthodontic pain, which include the ability of patients to adapt after the insertion new appliances, type of appliances, degrees of pain and discomfort, patient's attitude towards the treatment and their effects on patient's compliance.<sup>[5]</sup> The type of appliances may have significant effects on the patient's speech and swallowing, while patient's expectation of a good dental treatment and better appearance can lead to feeling of oral restriction and low self-confidence in public. Patient's experience with initial pain and discomfort can contribute to the acceptance of orthodontic treatment in general. Hence, this study aims to evaluate pain and discomfort experience by patients undergoing orthodontic treatment with different appliances after insertion and factors associated with orthodontic pain.

## **Materials and Method:-**

A questionnaire-based study was done among 100 participants who took part in the survey. The participants were divided into Group 1 consisting of 50 dental students and practitioners and Group 2 with a total of 50 dental patients coming for orthodontic treatment. All the participants were provided with a list of 10 questions related to pain during orthodontic treatment. Each group was given with different sets of questions. Data was collected and statistic analysis was done. Ideally, the sample size of the survey was calculated to be 132, which indicates 100 participants are sufficient for this study.

### Sample Size for Frequency in a Population

Population size(for finite population correction factor or fpc)(N): 200  
 Hypothesized % frequency of outcome factor in the population (p): 50%+/-5  
 Confidence limits as % of 100(absolute +/- %)(d): 5%  
 Design effect (for cluster surveys-DEFF): 1

#### Sample Size(n) for Various Confidence Levels

ConfidenceLevel(%)	Sample Size
95%	132
80%	91
90%	116
97%	141
99%	154
99.9%	169
99.99%	177

#### Equation

Sample size  $n = [DEFF * Np(1-p)] / [(d^2 / Z^2)_{1-\alpha/2} * (N-1) + p * (1-p)]$

Results from OpenEpi, Version 3, open source calculator--SSPropor  
 Print from the browser with ctrl-P  
 or select text to copy and paste to other programs.

**Figure 1:-Sample size calculation<sup>[6]</sup>**

**Table 1 (a):-Survey questions on orthodontic pain along with answers (for dental students and practitioners)**

GROUP 1: DENTAL STUDENTS AND PRACTITIONERS	
No.	Questions and Answers
1.	How would you rate the probability of patients with complaints of pain or discomfort during their dental treatment? <input type="radio"/> Low <input type="radio"/> Moderate <input type="radio"/> High <input type="radio"/> Others
2.	What do you think is the main component which contribute to orthodontic pain? <input type="radio"/> Sensory perception of intensity and discomfort <input type="radio"/> Cognitive influence <input type="radio"/> Emotional influence <input type="radio"/> Environmental influence <input type="radio"/> Psychological factors <input type="radio"/> Genetic factors or Personal traits <input type="radio"/> Others
3.	How would you rate the severity of pain or discomfort experienced by your patients? <input type="radio"/> Mild <input type="radio"/> Moderate <input type="radio"/> Severe
4.	When do your patients normally complain of pain or discomfort, following the placement of appliances? <input type="radio"/> Within 24 hours <input type="radio"/> Within 2 to 3 days <input type="radio"/> Within 4 to 5 days <input type="radio"/> More than 5 days <input type="radio"/> Others
	When do the pain or discomfort experienced by your patients normally subside? <input type="radio"/> Within 24 hours

5.	<ul style="list-style-type: none"> <li>○ Within 2 to 3 days</li> <li>○ Within 4 to 5 days</li> <li>○ More than 5 days</li> <li>○ Others</li> </ul>
6.	<p>Which factor do you think is commonly associated with orthodontic pain?</p> <ul style="list-style-type: none"> <li>○ Age</li> <li>○ Gender</li> <li>○ Ethnicity</li> <li>○ Anxiety and Fear</li> <li>○ Pain sensitivity</li> <li>○ Mood</li> <li>○ Catastrophizing</li> <li>○ Others</li> </ul>
7.	<p>How would you determine the risk of pain in your patients prior to an orthodontic treatment?</p> <ul style="list-style-type: none"> <li>○ Cold pressor testing</li> <li>○ Electric pulp testing</li> <li>○ Self-rating on oral health</li> <li>○ Tests on anxiety levels and dental fear</li> <li>○ Genetic variation tests</li> <li>○ Others</li> </ul>
8.	<p>How would you describe patient's compliance despite having pain or discomfort during the treatment?</p> <ul style="list-style-type: none"> <li>○ Good</li> <li>○ Moderate</li> <li>○ Poor</li> </ul>
9.	<p>Which method of pain control do you prefer for your patients?</p> <ul style="list-style-type: none"> <li>○ Non-steroidal anti-inflammatory drugs (NSAIDs)</li> <li>○ Low level laser therapy</li> <li>○ Transcutaneous electrical neural stimulation</li> <li>○ Vibratory stimulation</li> <li>○ Others</li> </ul>
10.	<p>Do you normally ensure that your patients are well-informed of the whole procedure prior to the dental treatment?</p> <ul style="list-style-type: none"> <li>○ Yes</li> <li>○ No</li> <li>○ Sometimes</li> </ul>

**Table 1 (b):-**Survey questions on orthodontic pain along with answers (for dental patients)

GROUP 2: DENTAL PATIENTS	
No.	Question and Answers
1.	<p>In the range of 1 to 10, how would you rate the importance of seeking an orthodontic treatment? (1 being the minimum and 10 being the maximum)</p> <p>1 (Minimum) – 10 (Maximum)</p>
2.	<p>When did you start having pain or discomfort, following the placement of appliances?</p> <ul style="list-style-type: none"> <li>○ Within 24 hours</li> <li>○ Within 2 to 3 days</li> <li>○ Within 4 to 5 days</li> <li>○ More than 5 days</li> <li>○ Others</li> </ul>
3.	<p>How long did it take for the pain or discomfort to subside?</p> <ul style="list-style-type: none"> <li>○ Within 24 hours</li> <li>○ Within 2 to 3 days</li> <li>○ Within 4 to 5 days</li> <li>○ More than 5 days</li> <li>○ Others</li> </ul>

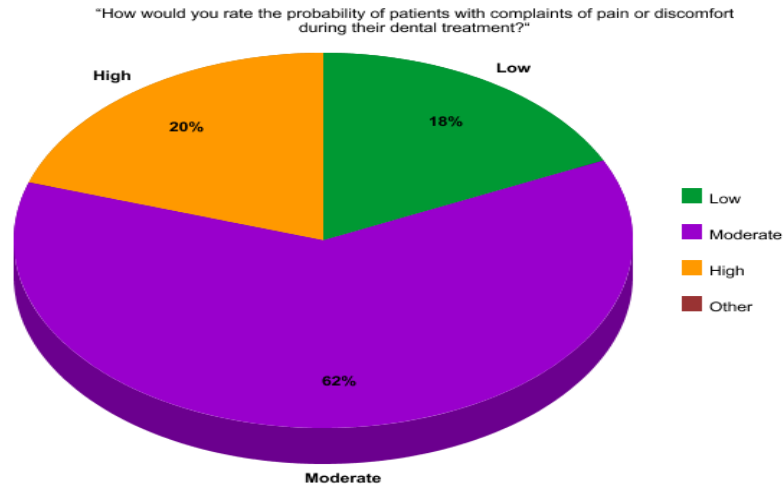
4.	How would you rate the severity of pain you experienced during the treatment? <input type="radio"/> Mild <input type="radio"/> Moderate <input type="radio"/> Severe <input type="radio"/> None
5.	Have you ever had a negative experience with any dental treatment previously? <input type="radio"/> Yes <input type="radio"/> No
6.	How would you describe your condition prior to the treatment? <input type="radio"/> Relaxed and calm <input type="radio"/> Happy and excited <input type="radio"/> Anxious and worried <input type="radio"/> Others
7.	Are you aware of the possible pain and discomfort associated with orthodontic treatment before you started it? <input type="radio"/> Yes <input type="radio"/> No
8.	Are you generally prone to react with pain, even in situations other than dentistry? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Sometimes
9.	Do you think you are well-informed about the whole procedure prior to the dental treatment? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not sure
10.	Are you still willing to proceed with the dental treatment despite having pain or discomfort? <input type="radio"/> Yes <input type="radio"/> No

### Results and Explanation

#### Group 1: Dental Students and Practitioners

**Table 2:-**“How would you rate the probability of patients with complaints of pain or discomfort during their dental treatment?”

Question 1	Percentage of Individuals (%)
Low	9
Moderate	31
High	10
Other	0

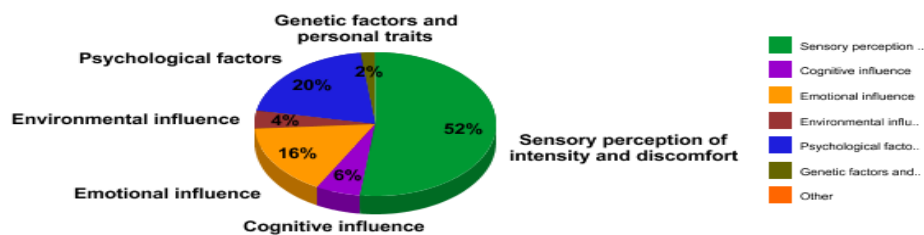


**Figure 2:-**"How would you rate the probability of patients with complaints of pain or discomfort during their dental treatment?"

**Table 3:-**"What do you think is the main component which contributes to orthodontic pain?"

Question 2	Percentage of Individuals (%)
Sensory perception of intensity and discomfort	26
Cognitive influence	3
Emotional influence	8
Environmental influence	2
Psychological factors	10
Genetic factors or personal traits	1
Other	0

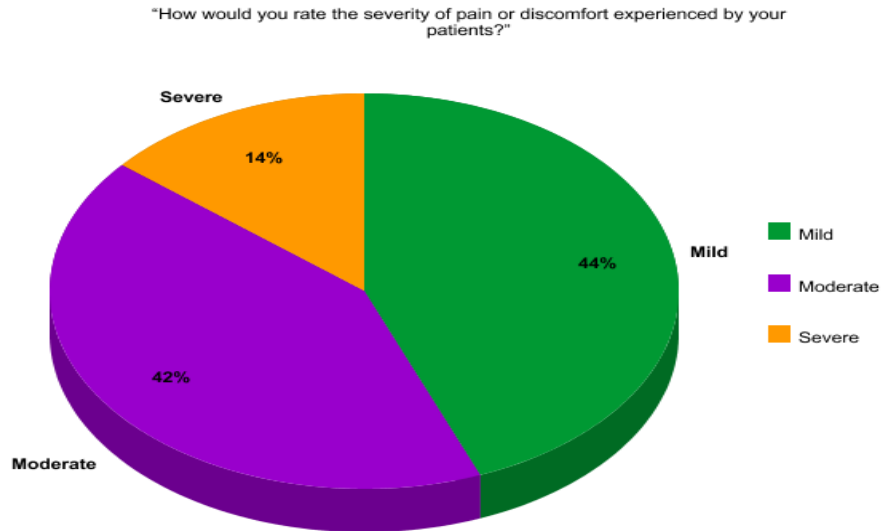
"What do you think is the main component which contribute to orthodontic pain?"



**Figure 3:-**"What do you think is the main component which contribute to orthodontic pain?"

**Table 4:-**"How would you rate the severity of pain or discomfort experienced by your patients?"

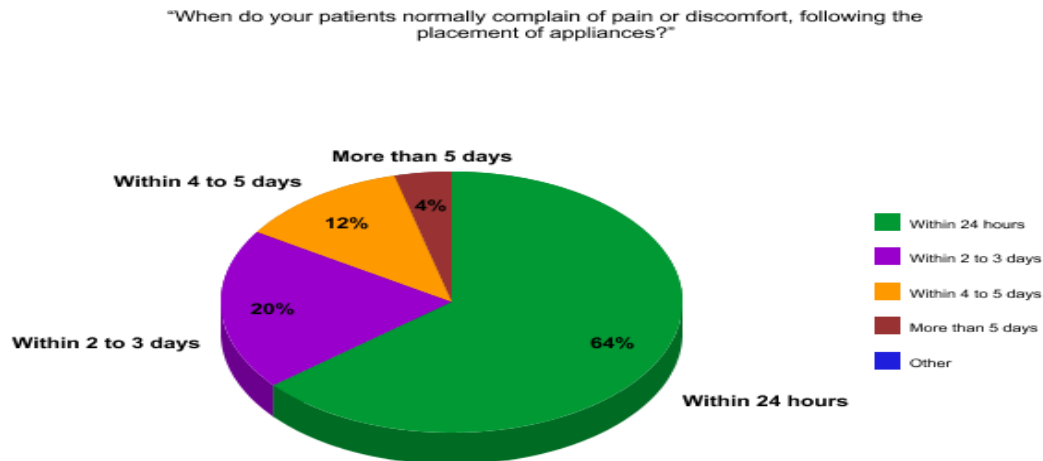
Question 3	Percentage of Individuals (%)
Mild	22
Moderate	21
Severe	7



**Figure 4:-**"How would you rate the severity of pain or discomfort experienced by your patients?"

**Table 5:-**"When do your patients normally complain of pain or discomfort, following the placement of appliances?"

Question 4	Percentage of Individuals (%)
Within 24 hours	32
Within 2 to 3 days	10
Within 4 to 5 days	6
More than 5 days	2
Other	0



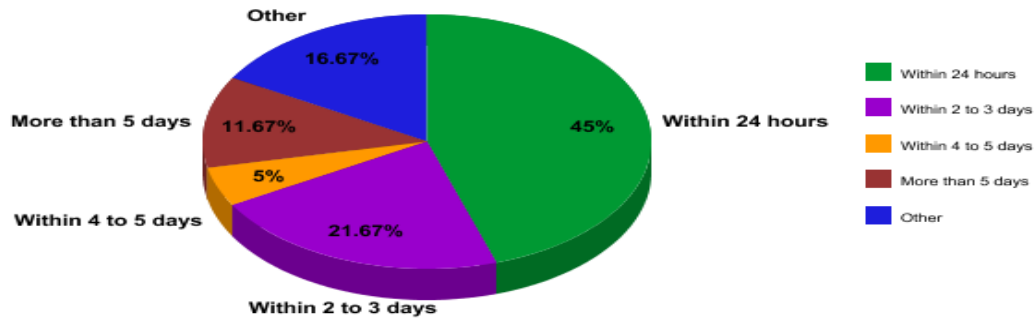
**Figure 5:-**"When do your patients normally complain of pain or discomfort, following the placement of appliances?"

**Table 6:-**"When do the pain or discomfort experienced by your patients normally subside?"

Question 5	Percentage of Individuals (%)
Within 24 hours	27
Within 2 to 3 days	13
Within 4 to 5 days	3

More than 5 days	7
Other	0

"When do the pain or discomfort experienced by your patients normally subside?"

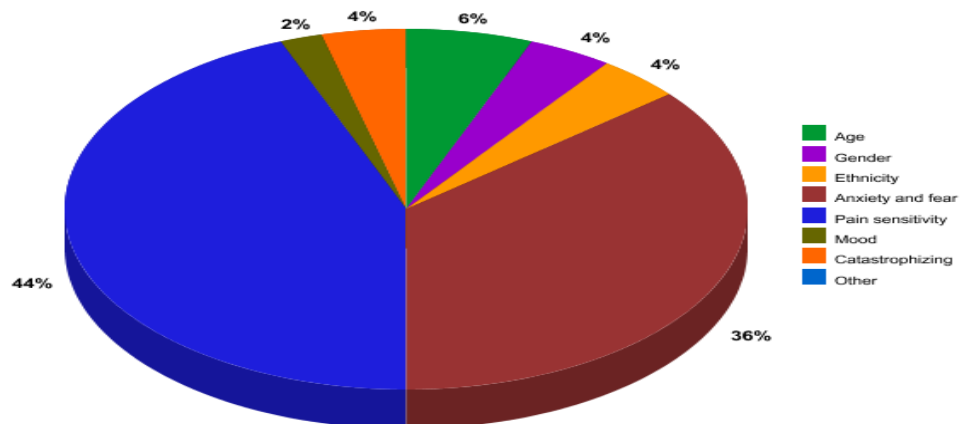


**Figure 6:-**"When do the pain or discomfort experienced by your patients normally subside?"

**Table 7:-**"Which factor do you think is commonly associated with orthodontic pain?"

Question 6	Percentage of Individuals (%)
Age	3
Gender	2
Ethnicity	2
Anxiety and fear	18
Pain sensitivity	22
Mood	1
Catastrophizing	2
Other	0

"Which factor do you think is commonly associated with orthodontic pain?"

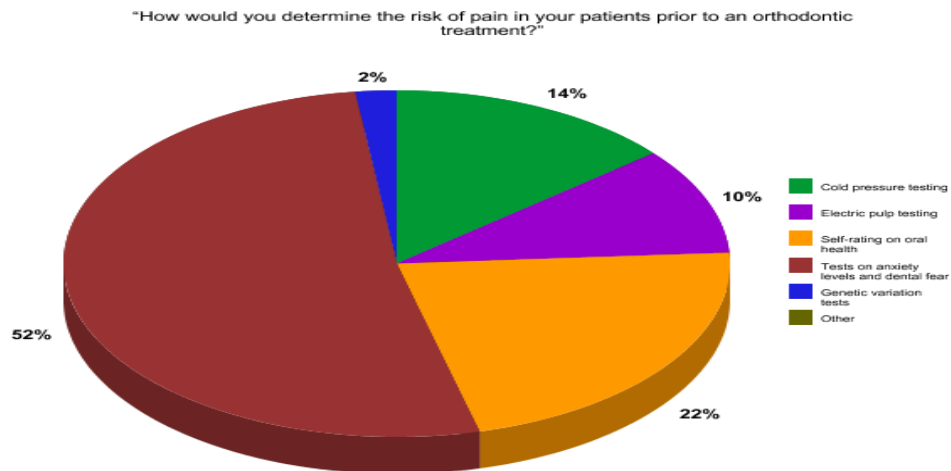


**Figure 7:-**"Which factor do you think is commonly associated with orthodontic pain?"

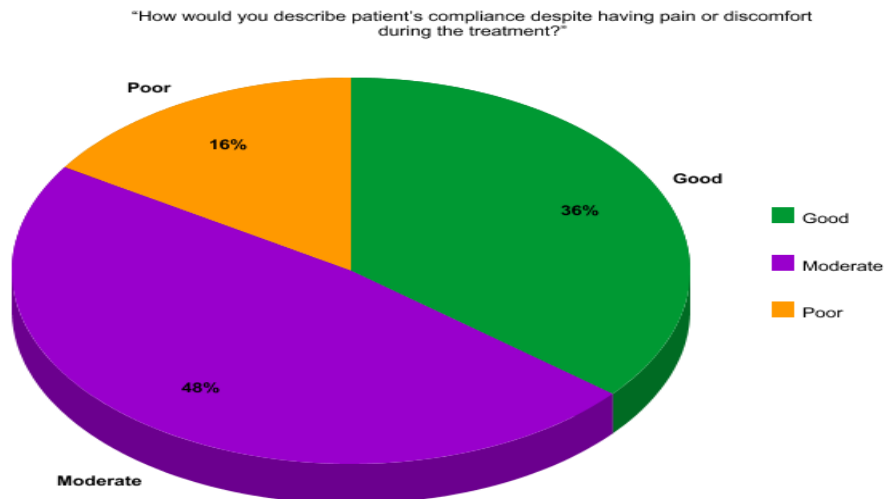


**Table 8:-**“How would you determine the risk of pain in your patients prior to an orthodontic treatment?”

Question 7	Percentage of Individuals (%)
Cold pressure testing	7
Electric pulp testing	5
Self-rating on oral health	11
Tests on anxiety levels and dental fear	26
Genetic variation tests	1
Other	0

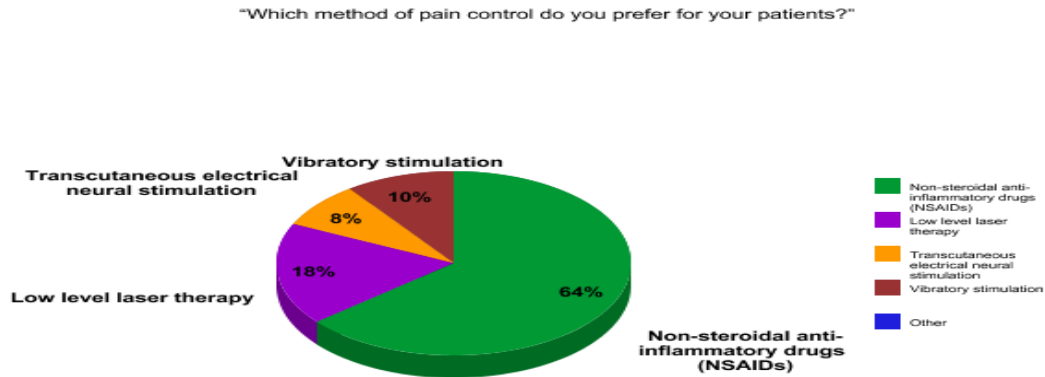
**Figure 8:-**“How would you determine the risk of pain in your patients prior to an orthodontic treatment?”**Table 9:-**“How would you describe patient’s compliance despite having pain or discomfort during the treatment?”

Question 8	Percentage of Individuals (%)
Good	18
Moderate	24
Poor	8

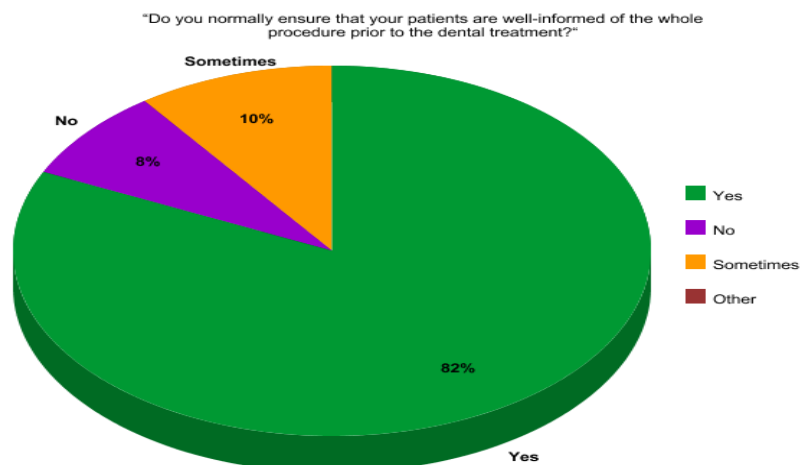
**Figure 9:-**“How would you describe patient’s compliance despite having pain or discomfort during the treatment?”

**Table 10:-**“Which method of pain control do you prefer for your patients?”

Question 9	Percentage of Individuals (%)
Non-steroidal anti-inflammatory drugs (NSAIDs)	32
Low level laser therapy	9
Transcutaneous electrical neural stimulation	4
Vibratory stimulation	5
Other	0

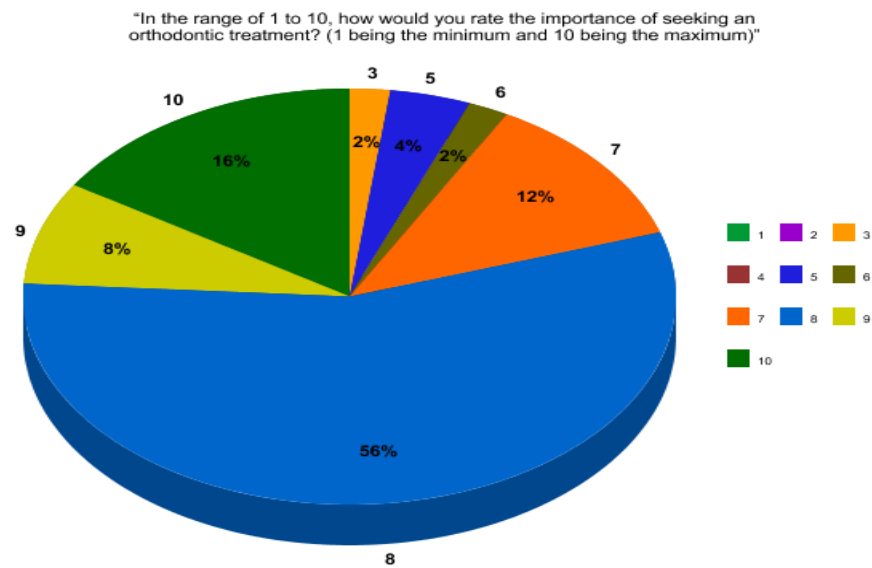
**Figure 10:-**“Which method of pain control do you prefer for your patients?”**Table 11:-**“Do you normally ensure that your patients are well-informed of the whole procedure prior to the dental treatment?”

Question 10	Percentage of Individuals (%)
Yes	41
No	4
Sometimes	5
Other	0

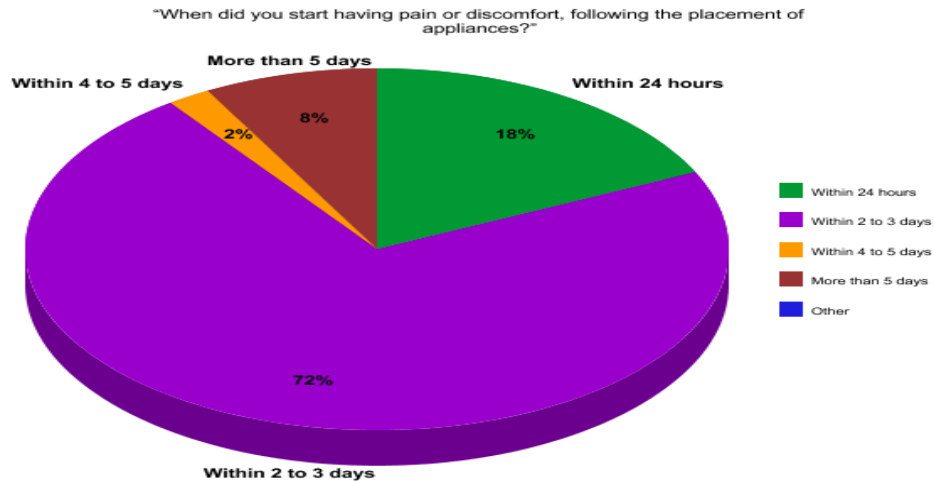
**Figure 11:-**“Do you normally ensure that your patients are well-informed of the whole procedure prior to the dental treatment?”

**Group 2: Dental Patients****Table 12:-**“In the range of 1 to 10, how would you rate the importance of seeking an orthodontic treatment? (1 being the minimum and 10 being the maximum)”

Question 1	Percentage of Participants (%)
1	0
2	0
3	1
4	0
5	2
6	1
7	6
8	28
9	4
10	8

**Figure 12:-** “In the range of 1 to 10, how would you rate the importance of seeking an orthodontic treatment? (1 being the minimum and 10 being the maximum)”**Table 13:-**“When did you start having pain or discomfort, following the placement of appliances?”

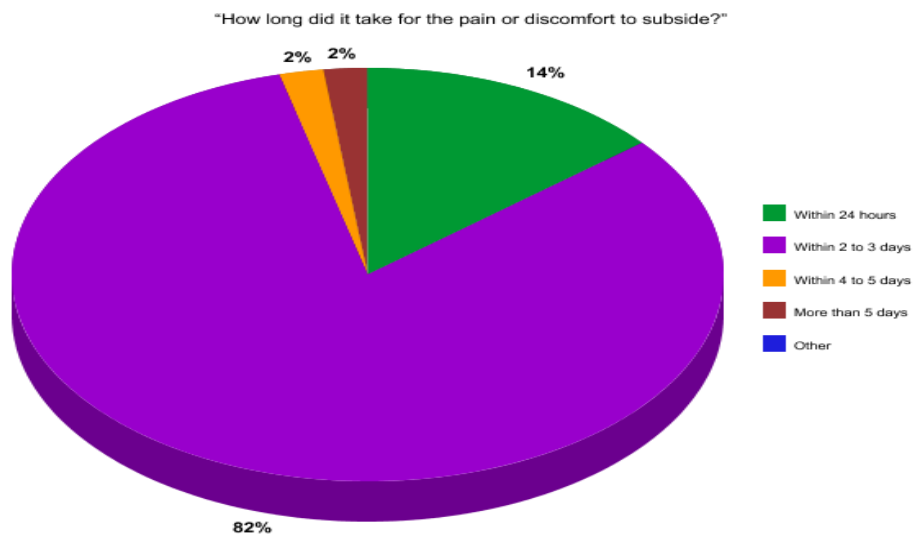
Question 2	Percentage of Individuals (%)
Within 24 hours	9
Within 2 to 3 days	36
Within 4 to 5 days	1
More than 5 days	4
Other	0



**Figure 13:-**"When did you start having pain or discomfort, following the placement of appliances?"

**Table 14:-**"How long did it take for the pain or discomfort to subside?"

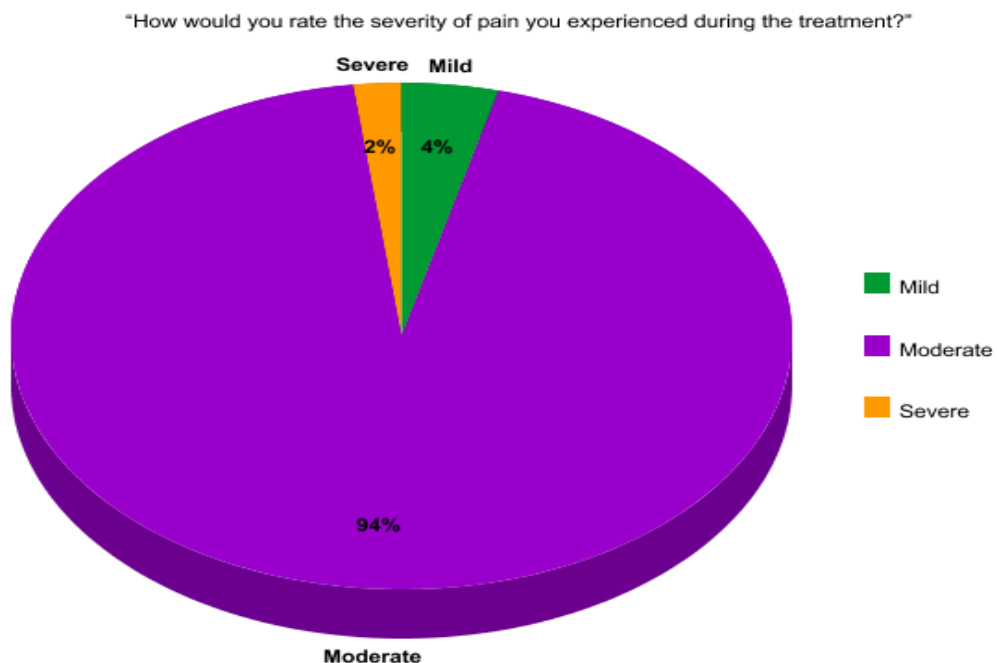
Question 3	Percentage of Individuals (%)
Within 24 hours	7
Within 2 to 3 days	41
Within 4 to 5 days	1
More than 5 days	1
Other	0



**Figure 14:-**"How long did it take for the pain or discomfort to subside?"

**Table 15:-**"How would you rate the severity of pain you experienced during the treatment?"

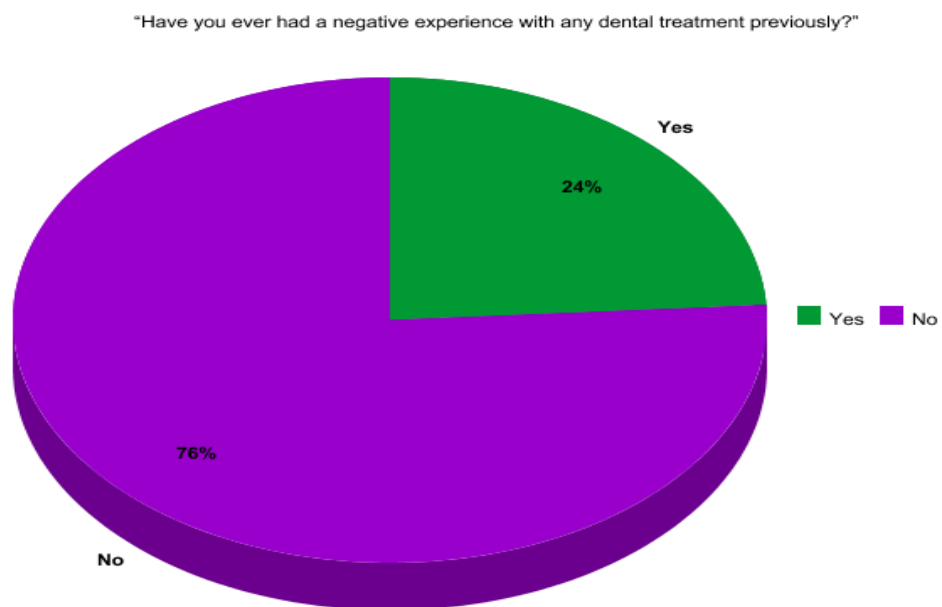
Question 4	Percentage of Individuals (%)
Mild	2
Moderate	47
Severe	1



**Figure 15:-**"How would you rate the severity of pain you experienced during the treatment?"

**Table 16:-**"Have you ever had a negative experience with any dental treatment previously?"

Question 5	Percentage of Individuals (%)
Yes	12
No	38

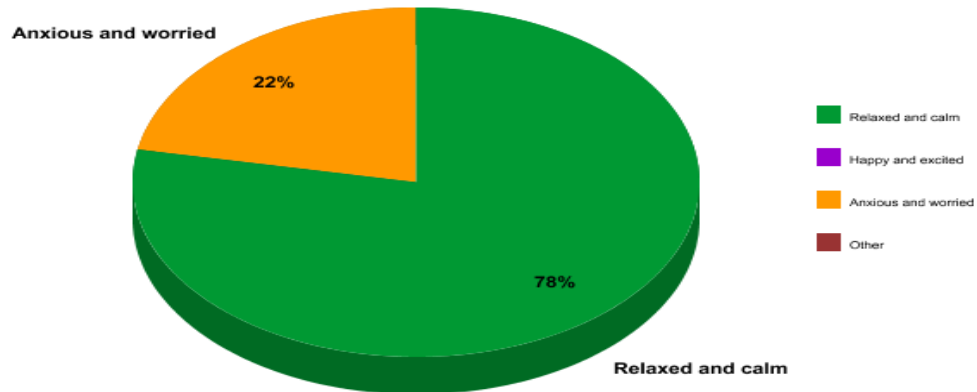


**Figure 16:-**"Have you ever had a negative experience with any dental treatment previously?"

**Table 17:-**“How would you describe your condition prior to the treatment?”

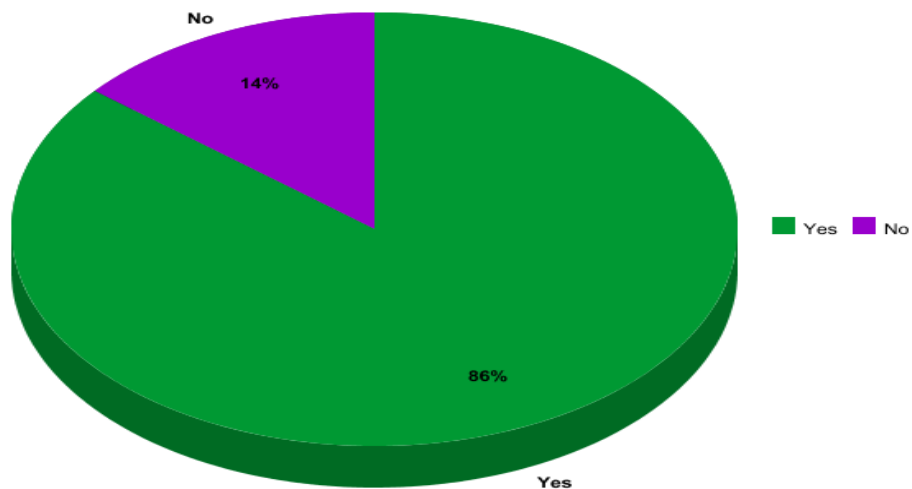
Question 6	Percentage of Individuals (%)
Relaxed and calm	39
Happy and excited	0
Anxious and worried	11
Other	0

“How would you describe your condition prior to the treatment?”

**Figure 17:-**“How would you describe your condition prior to the treatment?”**Table 18:-**“Are you aware of the possible pain and discomfort associated with orthodontic treatment before you started it?”

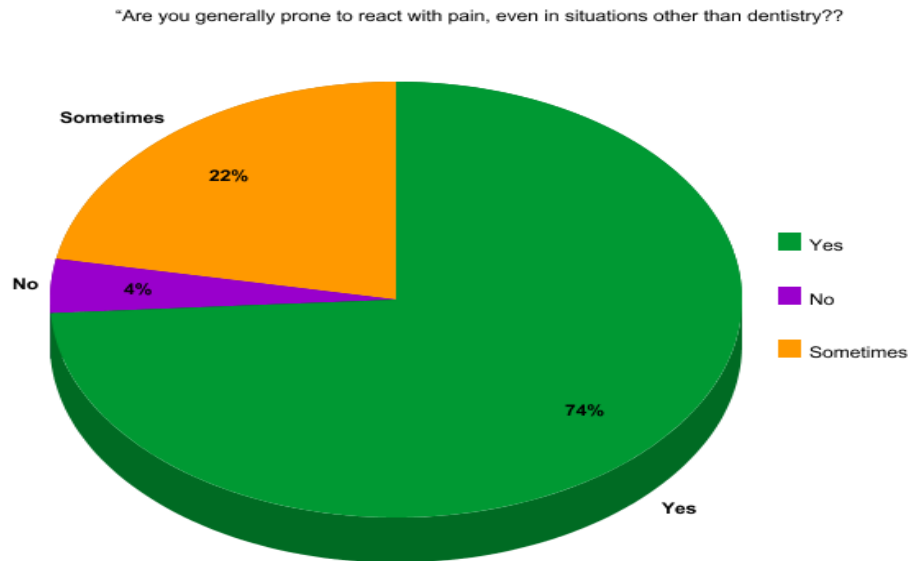
Question 7	Percentage of Individuals (%)
Yes	43
No	7

“Are you aware of the possible pain and discomfort associated with orthodontic treatment before you started it?”

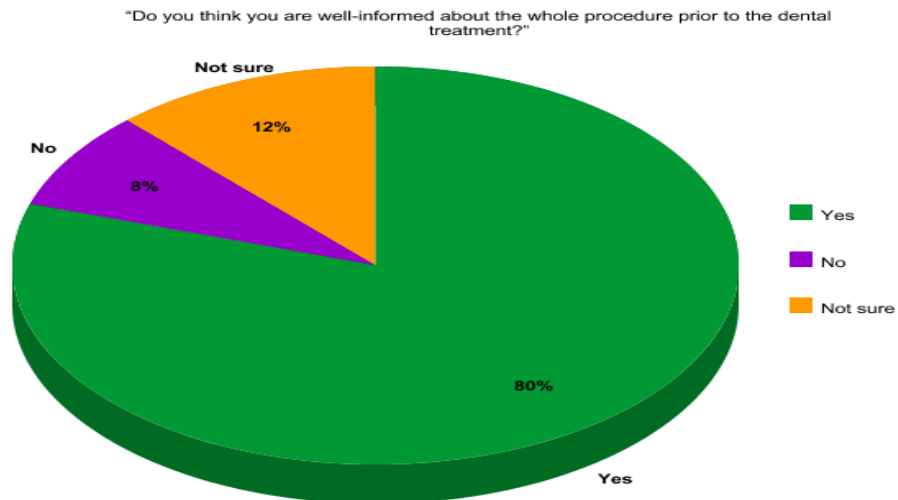
**Figure 18:-**“Are you aware of the possible pain and discomfort associated with orthodontic treatment before you started it?”

**Table 19:-**“Are you generally prone to react with pain, even in situations other than dentistry?”

Question 8	Percentage of Individuals (%)
Yes	37
No	2
Sometimes	11

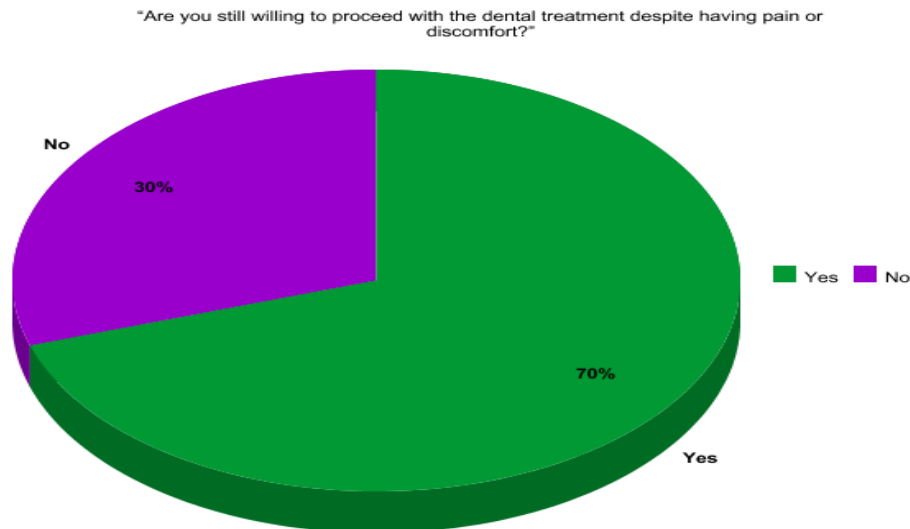
**Figure 19:-**“Are you generally prone to react with pain, even in situations other than dentistry?”**Table 20:-**“Do you think you are well-informed about the whole procedure prior to the dental treatment?”

Question 9	Percentage of Individuals (%)
Yes	40
No	4
Not sure	6

**Figure 20:-**“Do you think you are well-informed about the whole procedure prior to the dental treatment?”

**Table 21:-**“Are you still willing to proceed with the dental treatment despite having pain or discomfort?”

Question 10	Percentage of Individuals (%)
Yes	35
No	15

**Figure 21:-**“Are you still willing to proceed with the dental treatment despite having pain or discomfort?”

## Discussion:-

### Group 1: Dental Students and Practitioners

Based on Figure 1, 62% of the participants had chosen “moderate” as the rate of probability of patients with complaints of pain and discomfort during their dental treatment. It can be seen that 20% of them have encountered many cases of orthodontic pain as they suggested that there is a “high” probability of such problem, while 18% of them disagree with the idea by stating that the probability of patients with orthodontic pain is low. A study done in Singapore involving 203 adult Chinese patients state that 91% of the patients reported of pain after the placement of orthodontic appliances with 31% of them complaining of pain during every step of the procedure.<sup>[1]</sup>

According to 52% of the participants, sensory perception of intensity and discomfort is the main component, which contributes to orthodontic pain while genetic factors or personal traits is the least associated with orthodontic pain as chosen by 2% of the participants. Psychological factors is considered as major factor of orthodontic pain by 20% of the participants, followed by 16% of them suggesting emotional influence as the principal component. The remaining factors of cognitive and environmental factors are chosen by 6% and 4% of the participants respectively. A report by Melzack R (1965) stated that orthodontic pain is commonly associated with sensory perceptions of intensity and discomfort, along with cognitive, emotional and environmental factors.<sup>[5, 7, 8]</sup> The cognitive factors of pain often include patient’s anticipation, memory of past experiences and attention.<sup>[5, 9]</sup> Various researches have been done to determine the correlation of orthodontic pain with psychological factors and personal traits, which requires substantial resources to obtain and evaluate the data from patients.<sup>[2, 5, 10]</sup>

44% of the participants state that patients normally experience “mild” pain or discomfort in most cases of orthodontic pain, followed by 42% of them who rate the severity of pain as “moderate and only 14% of the total participants have seen patients with complaints of “severe” orthodontic pain. It has been reported that mild-to-severe pain can be seen in approximately 90% of patients seeking orthodontic treatment<sup>[1, 2]</sup>

The result in Figure 4 suggests that most cases of orthodontic pain begin within 24 hours as stated by 64% of the participants. 20% of them indicate that orthodontic pain normally requires at least 2 to 3 days before it finally begins. While 12% of them suggest that it normally takes 4 to 5 days for patients to begin their complaints of orthodontic pain and the remaining 4% have had patients with orthodontic pain after 5 days of treatment. A report by Jones (1984) states that patients complain of maximum pain or discomfort begins within 24 hours after the placement of separators or arch wires.<sup>[11, 12]</sup>



As for the relief of orthodontic pain, 45% of the participants state that it usually takes 24 hours for the pain to finally subside, followed by approximately 22% of them indicating relief of orthodontic pain occurs within 2 to 3 days. 5% of the participants suggest that orthodontic pain may begin only after 4 to 5 days or it may require more than 5 days to subside as stated by about 12% of them. A study by Krishnan (2007) indicates that orthodontic pain generally subsides after 48 hours or approximately 2 to 3 days and further reduces to the pre-application state within 7 days.<sup>[3]</sup> However, this idea is opposed by Scheurer et al who reported of pain in 25% of the patients even after 7 days. Another study states that pain normally disappears after 1 week, which supports the report by Jones (1984) who stated that the highest analgesic intake by most patients occurs within 3 days after the treatment.<sup>[2, 12]</sup>

Pain sensitivity is the most selected factor to be commonly associated with orthodontic pain chosen by 44% of the participants, followed by anxiety and fear chosen by 36% of them in total. Age is also considered as a main factor of orthodontic pain by 6% of the participants. Gender, ethnicity and catastrophizing are the least common factors associated with orthodontic pain according to the participants, each with only 4% of the votes. A study by Schuerer in 1996 states that orthodontic pain is commonly associated with patients aged of 13 to 16 years old, but other studies disagree with this idea indicating that most cases of orthodontic pain are seen in older patients.<sup>[2, 13]</sup> When it comes to gender differences, it has been reported that females tend to have lower pain thresholds and more complaints of pain compared to males, which is believed to be due to their greater awareness towards external threats.<sup>[14]</sup> In terms of ethnicity, A study by Woodrow and colleagues (1972) reported higher tolerance of pain in Caucasians compared to Asians who show higher tendency of pain and distress. It has been reported that anxiety and fear of dental treatment increases the tendency of orthodontic pain.<sup>[15]</sup> A study by Stewart and King (1994) states that individual's psychological health is closely related to pain or discomfort through their health state.<sup>[16]</sup> "Catastrophising" is a term used to describe "an individual's tendency to focus on and exaggerate the threat value of painful stimuli and negatively evaluate one's own ability to deal with pain".<sup>[17]</sup> A study in Canada states that the tendency of pain increases in patients with excessive focus on their pain sensations. Another study indicates that more pain are seen in catastrophisers than non-catastrophisers.<sup>[18]</sup>

Based on Figure 7, 52% of the participants would conduct tests on anxiety levels and dental fear to access the tendency of orthodontic pain. 22% of them suggest self-rating on oral health as the best method to determine the risk of pain. 14% with cold pressure testing and 10% of them had chosen electric pulp testing. Only 2% of the total participants would consider genetic variation tests. In a previous study, it has been proven that cold pressor test provides a valid and low-risk test that can be used to examine pain and it has been widely used for research purposes. A study in Japan reported 99% accuracy of EPT used in 396 teeth with vital pulps.<sup>[19]</sup>

Despite having orthodontic pain, patient's compliance is still good as indicated by 36% of the participants. As for 48% of the participants, patient's compliance becomes moderate following their experience with orthodontic pain while the remaining 16% indicates poor patient's compliance after their encounter with pain or discomfort. By comparison, a study by Patel in 1989 suggests that 10% of patients will discontinue their treatment due to their pain experience. It is supported by another study stating that every tenth orthodontic patient tend to stop attending their treatment due to the pain they experience during the early stages.<sup>[20, 21]</sup>

In the treatment of orthodontic pain, 64% of the participants prefer the use of non-steroidal anti-inflammatory drugs (NSAIDs), followed by 18% with low level laser therapy, 8% with transcutaneous electrical neural stimulation and 10% chose vibratory stimulation as their preferred treatment modalities. According to Polat O and colleagues, NSAIDs is indeed the most preferred treatment modality for pain control with high rate of success. Unfortunately, many complications have been associated with the use of NSAIDs such as thrombocytopenia, skin rashes and headaches.<sup>[22]</sup>

In the matter of informing the patients of the whole procedure prior to the dental treatment, 82% answered "Yes", followed by 10% with "Sometimes" and "No" by 8% of the participants. From a previous study done by Johnson J and Leventhal H, it can be seen that patients who are well-informed of the entire dental procedure required less pain medication than those who are unaware of the treatment process as patients are said to have average pain perception with proper knowledge about the procedure that they will undergo.<sup>[23]</sup> This finding supports the study by Touyz and Marchand who indicate that the risk of pain reduces as the patient acquired better understanding of the complete procedure.<sup>[24]</sup>

### Group 2: Dental Patients

Based on Figure 1, it can be seen that most of the patients consider seeking an orthodontic treatment as important with an average score of 8. 56% of the participants rated “8” as to how important an orthodontic treatment is for them and the minimum score of “3” is selected by 2% of the participants, which indicate their low desire for orthodontic treatment. It has been previously reported by Serg et al that patients with higher demand for orthodontic correction show lower intensity of pain as they are highly motivated to receive the treatment, while another study by Berguis et al indicates prolonged pain seen in less motivated patients.<sup>[25]</sup>

It can be seen that most patients normally experience pain or discomfort after 2 to 3 days of treatment as stated by 72% of them. Some may also experience pain within 24 hours as indicated by 18% of the participants, while 8% reported of pain only after 5 days or within 4 to 5 days as chosen by 2% of the participants. According to 82% of the participants, pain usually subside within 2 to 3 days after the treatment, while 14% of them suggest that the relief of orthodontic pain may occur within 24 hours. 2% of the participants indicate that pain relief only begins after 5 days or within 4 to 5 days as selected by another 2% of them.

In figure 4, most of the participants (94%) complain of moderate pain, in which they experience during their orthodontic treatment. 4% of them have only experienced mild orthodontic pain and only 2% of the participants complained of severe pain during the treatment. It has been reported previously that patient's response to orthodontic treatment varies from one individual to another, as some patients may experience severe pain while others may complain of only slight discomfort.<sup>[7, 26, 27]</sup>

The result shown in Figure 5 states that 76% of the participants have never had a negative experience during any dental treatment before, while the remaining 24% of them showed otherwise as they have encountered such problem previously. It was reported that orthodontic pain is also commonly associated with negative dental treatments, which may have been experienced by the patients previously.<sup>[28, 29]</sup> In a study by Locker D and colleagues, 71% of the patients reported that they have had a negative dental experience related to pain with 30% of them having more than 3 of such incidents.<sup>[30]</sup>

Based on Figure 6, it can be seen that most patients (78%) attend the clinic while being relaxed and calm, although 11% of the participant showed the opposite, as they are often anxious and worried prior to a dental treatment. According to Keefe FJ and colleagues, affective states such as anxiety, fear, stress, panic and depression experienced by the patients prior to a dental treatment may contribute to pain perception and expression by the patients.<sup>[4]</sup>

Based on the patients' point of view, 86% of them are indeed aware of the possible pain and discomfort associated with orthodontic treatment before the procedure begins. On the contrary, 14% of the participants are unaware of this condition, which indicates their high expectation that the treatment is painless and comfortable throughout the time. A report by Bos et al states that patients who have had experiences of orthodontic treatment previously show better attitudes during the procedure as compared to those who have never experienced such treatment before.<sup>[33]</sup>

Generally, 74% of the patients are prone to react with pain, even in situations other than dentistry, 22% of them indicate such behavior only in some situations and the remaining 4% of them rarely react with pain in general settings.

The result in Figure 9 indicates that 80% of the participants agree that they are well-informed of the whole procedure prior to the start of treatment, 12% of them are unsure of whether they are aware of the entire procedure and 8% of the participants state that they are not informed properly of the procedure prior to the dental treatment.

Based on Figure 10, it can be seen that 70% of the participants are still willing to proceed with the dental treatment despite having pain or discomfort, while the remaining 15% of them would rather discontinue with the treatment. A study by Bergius M and colleagues reported that 70% of patients are willing to undergo prolonged duration of treatment, along with their readiness to experience severe pain in order to attain properly arranged teeth.<sup>[27]</sup>

### Conclusion:-

Orthodontic pain has always been a great concern for most dentists all over the world. Pain is usually related an individual's personal experience which is rarely associated with injury to the tissue structure. Despite the current

technology in orthodontics, most patients still experience some discomfort or pain in relation to orthodontic treatment with approximately 90% of patients would complain of pain during any stage of their dental treatment. Pain experienced by patient during an orthodontic treatment usually occurs along with other sensations such as anxiety and fear.<sup>32</sup> It is very important for every dentist to have a basic knowledge and understanding of orthodontic pain in order to overcome this condition in a clinical setting.

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