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AAO Foundation Final Report Form (a/o 6/30/2019)

In an attempt to make things a little easier for the reviewer who will read this report, please consider these two questions before this is sent for review:

- Is this an example of your very best work, in that it provides sufficient explanation and justification, and is something otherwise worthy of publication? (We do publish the Final Report on our website, so this does need to be complete and polished.)*
- Does this Final Report provide the level of detail, etc. that you would expect, if you were the reviewer?*

Please prepare a report that addresses the following:

Type of Award, e.g., Orthodontic Faculty Development Fellowship Award, Postdoctoral Fellowship Award, Biomedical Research Award, Center Award, Educational Innovation Award, Program Award, Research Aid Award

Name(s) of Principal Investigator(s)

Institution

Title of Project

Period of AAOF Support (e.g. 07-01-20 to 06-30-21):

Amount of Funding

Summary/Abstract

Detailed results and inferences:

1. If the work has been published please attach a pdf of manuscript OR
2. Describe in detail the results of your study. The intent is to share the knowledge you have generated with the AAOF and orthodontic community specifically and other who may benefit from your study. Table, Figures, Statistical Analysis and interpretation of results should be included.

Respond to the following questions:

1. Were the original, specific aims of the proposal realized?
2. Were the results published?
 - a. If so, cite reference/s for publication/s including titles, dates, author or co-authors, journal, issue and page numbers
 - b. Was AAOF support acknowledged?
 - c. If not, are there plans to publish? If not, why not?
3. Have the results of this proposal been presented?
 - a. If so, list titles, author or co-authors of these presentation/s, year and locations
 - b. Was AAOF support acknowledged?
 - c. If not, are there plans to do so? If not, why not?
4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?

Accounting for Project; i.e., any leftover funds, etc.

Please see responses attached.

AAO FOUNDATION FINAL REPORT

Type of Award: Research Aid Award

Principal Investigator: Claudia Acosta Lenis

Institution: Roseman University of Health Sciences

Period of AAOF Support: 7/1/20 – 6/30/21

Amount of Funding: \$3,750

Summary/Abstract:

Introduction

The purpose of this study was to evaluate the general public's perception, knowledge and preferences on orthodontic treatment rendered by an orthodontist versus the "Do-It Yourself" orthodontics (DIYO) concept, without professional supervision. The secondary objective was to assess laypeople's awareness on the risks and limitations of DIYO.

Methods

The authors designed an observational study employing a 24-question online survey questionnaire, which was administered to 526 laypeople who had no professional experience or background in dentistry and orthodontics. All data was collected over 3 days (July 20-23, 2020) by Qualtrics' server, forwarded to the principal investigator. Data was analyzed with IBM® SPSS® version 26. Descriptive statistics were calculated using Chi-square tests.

Results

The results showed that the most important reason for laypeople to opt for DIYO is financial reason. People who have undergone orthodontic treatment know the difference between a general dentist and an orthodontist, whereas people who have not had orthodontic treatment are less likely to know the difference. Of the 285 people who did not receive orthodontic treatment before by a dental professional, 43 have considered DIYO. 122 of the 526 people considered DIYO, and 79 of the 122 had orthodontic treatment before. 26 of the 122 did not consider the clinical exam and diagnostic records important and would be comfortable without in-person supervision. 83 of the 122 would be comfortable not having in-person supervision, and still considered this treatment modality "Doctor-Directed".

Conclusions

The main reason laypeople utilize DIYO is the low cost. Some DIYO users do not consider risks involved and a small percentage consider their own dentist responsible if any issues arise with DIYO. One third of respondents will consider DIYO in the future.

Detailed results and inferences:

1. If the work has been published please attach a pdf of manuscript OR
2. Describe in detail the results of your study. The intent is to share the knowledge you have generated with the AAOF and orthodontic community specifically and other who may benefit from your study. Table, Figures, Statistical Analysis and interpretation of results should be included.

Manuscript sent to AJODO attached to this document.

AAO FOUNDATION FINAL REPORT

Respond to the following questions:

1. Were the original, specific aims of the proposal realized?
Yes, 526 completed surveys were done, and based on the results, the aims and purpose of the project were achieved.

2. Were the results published?
Manuscript was sent to AJO-DO on 02/25/2021
 - a. If so, cite reference/s for publication/s including titles, dates, author or co-authors, journal, issue and page numbers
 - b. Was AAOF support acknowledged?
Yes, please see the Acknowledgments section in the manuscript
 - c. If not, are there plans to publish? If not, why not?

3. Have the results of this proposal been presented?
Yes, as a graduation requirement. Roseman University of Health Sciences AEODO/MBA Residency Program.
 - a. If so, list titles, author or co-authors of these presentation/s, year, and locations
Title: Public Perception and Understanding of Risks Associated with Do-It-Yourself Orthodontics
Authors: ACOSTA LENIS, Claudia
SUBRAMANI, Karthikeyan
STEVENS, Richard
BOLLU, Prashanti
CHAYDHRY, Kishore
Year: December 14th, 2020
Location: Roseman University of Health Sciences. Henderson, NV Campus. AEODO/MBA program.
 - b. Was AAOF support acknowledged?
Yes, as part of the PowerPoint presentation
 - c. If not, are there plans to do so? If not, why not? N/A

4. To what extent have you used, or how do you intend to use, AAOF funding to further your career?
As a resident I have never had the experience of writing a grant. AAOF gave me the opportunity to learn how to write, apply and follow up the whole process. I used the funding to pay for Qualtrics' services. It saved me time to find the responders and focus more in designing and developing a more comprehensive survey.

AAOF has encouraged me to keep pursuing my career in academics. It made me appreciate even more the hard-working researchers. May this be the first of many grants in the future.

Accounting for Project, i.e., any leftover funds, etc.

Qualtrics Services July 2020 \$2,375.00

Leftover Funds as of 04/27/2021. \$1,375.00

American Journal of Orthodontics & Dentofacial Orthopedics

Public Perceptions and Understanding of Risks Associated with Do-It-Yourself Orthodontics: A Survey Study

--Manuscript Draft--

Manuscript Number:	AJODO-D-21-00186
Article Type:	Original Article
Keywords:	Do-It-Yourself (DIY); Direct-To-Consumer (DTC); orthodontics; dentistry
Corresponding Author:	Claudia AcostaLenis, DDS Roseman University of Health Sciences Henderson, NV UNITED STATES
First Author:	Claudia AcostaLenis, DDS
Order of Authors:	Claudia AcostaLenis, DDS Karthikeyan Subramani Prashanti Bollu Richard Stevens Kishore Chaudhry
Abstract:	<p>Introduction</p> <p>The purpose of this study was to evaluate general public’s perception, knowledge and preferences on orthodontic treatment rendered by an orthodontist versus the “Do-It-Yourself” orthodontics (DIYO) concept, without professional supervision. The secondary objective was to assess laypeople’s awareness on the risks and limitations of DIYO.</p> <p>Methods</p> <p>The authors designed an observational study employing a 24-question online survey questionnaire, which was administered to 526 laypeople who had no professional experience or background in dentistry and orthodontics. All data was collected over 3 days (July 20-23, 2020) by Qualtrics’ server, forwarded to the principal investigator. Data was analyzed with IBM® SPSS® version 26. Descriptive statistics were calculated using Chi-square tests.</p> <p>Results</p> <p>The results showed that the most important reason for laypeople to opt for DIYO is financial reason. People who have undergone orthodontic treatment know the difference between a general dentist and an orthodontist, whereas people who have not had orthodontic treatment are less likely to know the difference. Of the 285 people who did not receive orthodontic treatment before by a dental professional, 43 have considered DIYO. 122 of the 526 people considered DIYO, and 79 of the 122 had orthodontic treatment before. 26 of the 122 did not consider the clinical exam and diagnostic records important and would be comfortable without in-person supervision. 83 of the 122 would be comfortable not having in-person supervision, and still considered this treatment modality “Doctor-Directed”.</p> <p>Conclusions</p> <p>The main reason laypeople utilize DIYO is the low cost. Some DIYO users do not consider risks involved and a small percentage consider their own dentist responsible if any issues arise with DIYO. One third of respondents will consider DIYO in the future.</p>

February 25th, 2021

Rolf G. Behrents, DDS

Editor-in-chief

American Journal of Orthodontics and Dentofacial Orthopedics

Dear Dr. Behrents,

Attached please find our paper entitled *Public Perception and Understanding of Risks Associated with Do-It-Yourself Orthodontics: A Survey Study*, which we would like to be considered for publication in the American Journal of Orthodontics and Dentofacial Orthopedics (AJODO).

In consideration of AJODO taking action in reviewing and editing our submission, the authors undersigned hereby transfer, assign, or otherwise convey all copyright ownership to the American Association of Orthodontists in the event that such work is published in AJODO.

The undersigned authors understand that if the manuscript is accepted, the Editors reserve the right to determine when and how it will be published. We understand that articles accepted for publication are subject to editorial revision.

Sincerely,

Claudia Acosta Lenis, DDS, MBA

Karthikeyan Subramani, BDS, MSc, MS

Prashanti Bollu, BDS, MBA, MS, DMD

Kishore Chaudhry, MD

Richard Stevens, DMD

**Public Perception and Understanding of Risks Associated with Do-It-Yourself
Orthodontics: A Survey Study**

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Highlights

1. Reasons why laypeople utilize Do-It-Yourself (DIY) instead of an orthodontist
2. Perception of risks involved in Do-It-yourself (DIY) orthodontics
3. Assessment of responsibility and level of comfort without professional supervision

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4 **Public Perceptions and Understanding of Risks Associated with Do-It-**
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6 **Yourself Orthodontics: A Survey Study**
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12 **ABSTRACT**
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16 **Introduction:** The purpose of this study was to evaluate general public's perception,
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18 knowledge and preferences on orthodontic treatment rendered by an orthodontist versus
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20 the "Do-It-Yourself" orthodontics (DIYO) concept, without professional supervision. The
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laypeople utilize DIYO is the low cost. Some DIYO users do not consider risks involved and a small percentage consider their own dentist responsible if any issues arise with DIYO. One third of respondents will consider DIYO in the future.

Keywords: Do-It-Yourself (DIY), Direct-To-Consumer (DTC), orthodontics, dentistry.

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4 Orthodontics (Greek *orthos*, which means “straight, correct” and *oden*, “tooth”) is the
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6 specialized field of dentistry which deals with the diagnosis, prevention, and correction of
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8 malpositioned teeth. Treatment requires a comprehensive, patient-oriented medical and
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10 dental evaluation performed by a trained professional. Different approaches are often
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12 required to meet biological goals, which lead to successful treatment. Continuous
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14 evaluation and supervision of the therapy by the specialist is mandatory. Orthodontics is
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16 regulated by the American Board of Orthodontics, whose mission is “to elevate the quality
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18 of orthodontic care for the public by promoting excellence through certification, education,
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20 and professional collaboration”.¹ In order to practice dentistry in the United States of
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22 America (USA), a dentist must meet three requirements: education, a written
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24 examination, and a clinical examination.²
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35 The Do-It-Yourself (DIY) concept has a long history in the USA, especially in the domain
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37 of home renovation, but in general it is applied to any method involving construction,
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39 reconstruction, or repairing things without the direct assistance of a professional in a given
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41 field. Regarding the dental profession, it is important to note that DIY products and
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43 services are not provided by licensed dentists or specialists and are not consistent with
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45 the Dental Practice Act of all 50 states. Taking high-quality impressions, for example,
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47 requires time and training, and a failure in this step can lead to errors in the proper
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49 diagnosis and treatment.³ Moreover, studies have demonstrated that orthodontists spend
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51 less time on treatment and achieve better quality outcomes than general practitioners
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53 who have not undertaken an extensive training of specialization in orthodontics.⁴
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4 Recently, the Do-It-Yourself orthodontics (DIYO) concept has emerged as an alternative
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6 for laypeople to treat malocclusions by themselves, with an online alliance. DIYO refers
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8 to a patient's self-directed efforts to move teeth without the orthodontist's supervision, and
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10 bypassing important diagnostic means.⁵ This philosophy is also known as "Direct-to-
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12 Customer" (DTC), "Doctor- Directed," and "At Home Clear Aligner Therapy". The label
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14 "doctor-directed" is misleading and the difference between DIYO and DTC is minimal.
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16 This research group chose the term DIYO because laypeople have a better
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18 understanding of this concept.
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28 The first report of DIYO was published in 2016 and it reported the case of a 23-year-old
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30 student at New Jersey Institute of Technology who, after researching the literature on
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32 aligners, took his own alginate impressions, poured them up with PermaStone® (Galeton,
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34 PA), scanned the casts, and then employed a software to digitally model tooth alignment
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36 towards what he determined was the proper position.^{6,7} After buying specific plastic on
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38 the internet, he fabricated 12 aligners over the same number of models he created using
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40 a 3D printer. The reported total cost of treatment was \$60.
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47 After analyzing the economic implications of the first DIYO report, entrepreneurs rapidly
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49 capitalized on the idea and developed a new industry. DIYO companies drafted a model
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51 in which self-taken photos and self-taken impressions using mold kits (or an intraoral scan
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53 taken in one of their DIYO shops) are the only requirements. Medical/Dental history,
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55 physical examination, and diagnostic records are not part of the equation. DIYO
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57 companies hold the client responsible for seeking dental care before and after treatment.
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4 The client completes a questionnaire and signs the informed consent and arbitration
5 agreements. When a layperson buys DIYO, a dentist or an orthodontist is notified by email
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7 that the customer’s treatment plan is ready for review.
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14 Treatment is only targeted at aligning the anterior teeth over the course of a few months,
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16 with the user receiving new sets of aligners by mail. The customer self-evaluates the
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18 results, which means that treatment is not “doctor-directed.” Furthermore, comprehensive
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20 records, treatment objectives, treatment plan/alternatives, normal and abnormal clinical
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22 findings, description of the treatment rendered, proper informed consent, referrals, and
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24 other important considerations are not part of DIYO. From a legal standpoint, these
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26 missing documents are the only way an orthodontist can support decisions and
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28 interactions during the treatment.⁸
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36 As of January 2020, there were at least seven companies offering at-home aligners in the
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38 USA. By eliminating in-person professional supervision and monitoring, companies are
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40 able to offer treatment for thousands of dollars less.⁹ The primary purpose of this study
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42 was to evaluate laypeople preferences and knowledge of orthodontic treatment done by
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44 an orthodontist versus DIYO. The secondary objectives were to examine the reasons
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46 laypeople utilize DIYO and to establish if they were aware of the risks and limitations
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48 involved.
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56 **MATERIAL AND METHODS**
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4 To fulfill the aims of the present investigation, an observational survey study was
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6 designed and implemented. This study was approved by [REDACTED]
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8 [REDACTED] A survey questionnaire with 24
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10 questions and a cover letter discussing the aims of the study were distributed by an online
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12 survey platform (www.qualtrics.com). Inclusion criteria consisted of: Respondents 18
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14 years to 65 years of age, persons without professional or specialized knowledge in the
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16 dental field and no dental education, training, or work experience. Dental students,
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18 dentists, hygienists, assistants, dental personnel were specifically excluded. Similarly,
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20 anyone with previous formal dental training were also excluded from the study.
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30 The survey was designed in a manner, if the respondents who positively answered the
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32 question: *“Have you ever considered doing Orthodontic treatment by yourself?”* would
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34 continue the survey until the end. The survey questions were designed to: 1) Establish
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36 demographics, 2) Assess people’s familiarity with orthodontics, and 3) Assess people’s
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38 perception and understanding of risks of DIYO. Data was collected over three days with
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40 526 respondents and analyzed with IBM® SPSS® version 26 (Armonk, NY). Descriptive
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42 statistics were calculated using Chi-square tests.
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51 **RESULTS**

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54 This survey got 526 completed responses. Gender-wise it was 50 % females and 49%
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56 males. Millennials were 57% of the total sample. When analyzing annual household
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58 income, half of the sample earned less than \$50,000, about one-third of the sample
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4 earned between \$50,000 and \$100,000. Basically 76% of the sample earned less than
5 \$100,000. Although the education response was individual and the income in this survey
6 was household based, findings were statistically significant ($p < .001$). Income, therefore,
7 correlates highly with level of education.
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10 11 12 13 14 15 16 17 18 *Laypeople's familiarity with dentistry*

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21 In the second part of the survey, it was assessed if laypeople knew the difference between
22 a general dentist and an orthodontic specialist. 66% stated that they knew the difference,
23 while 16% of them did not know the difference. 18% were not sure about the difference.
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32 As far as previous history of orthodontic treatment, 241 (45.8%) out of 526 people had
33 received orthodontic treatment (Brackets, clear trays/aligners), while 285 (54.2%) of the
34 responders had not received orthodontic treatment. Of the 241 people who answered
35 yes to having received orthodontic treatment, 205 of them responded knowing the
36 difference between a general practitioner (GP) and an orthodontist. Knowledge on
37 difference between a GP and an orthodontist was higher among persons who had
38 received orthodontic treatment (Figure 1). Among those who had orthodontic treatment
39 and know the difference between GP and an orthodontist, 98% of them were able to
40 recognize the provider. 68% said the treatment was done by an orthodontist and 25% by
41 a GP. These findings were statistically significant ($p < 0.001$)
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4 *DIY and laypeople's awareness*
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8 The last and most important part of this survey was to gather information about people's
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10 desire to utilize DIYO. 404 (76.8%) out of the 526 respondents have never considered
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12 DIYO, while 122 (23.2%) considered it. Among the 122, 63 (51.6%) of them have used
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14 clear aligners, 51 (41.7%) of them have used rubber bands, and 8 (6.6%) of them used
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16 other devices. Among the 241 people who received orthodontic treatment (Brackets, clear
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18 trays/aligners) by a dental professional, 79 (32.8%) of them have considered DIYO as
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20 well; these findings were statistically significant ($p < .001$). Of the 285 people who have
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22 not received orthodontic treatment, 43 (15.1%) have considered DIYO and 242 (84.9%)
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24 of them have not consider DIYO.
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33 We asked laypeople the reasons why they would consider utilizing DIYO. We chose the
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35 following three groups: the whole population (526 respondents), those who previously
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37 had orthodontic treatment done by a professional (241), and those who never had
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39 orthodontic treatment done by a professional (285). All three groups had 3 main reasons
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41 in common for considering DIYO, financial being the primary reason. The second most
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43 common reason was because they considered their problem easy to fix. The third most
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45 common reason was divided between a desire to avoid having braces or wires on their
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47 teeth, and people thinking they had sufficient knowledge of orthodontics to manage their
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49 own treatment without professional supervision. Reduced treatment time and the promise
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51 of having their money refunded were two additional reasons given by the 285 who never
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53 had orthodontic treatment before.
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For two of these groups, the total population, and those who had received treatment before, the fourth most common reason was that they only considered alignment of the front teeth important. For the total population, other common reasons were divided among reduced treatment time, elimination of travel, the promise of getting their money back if the aligners did not fit, and believing they had enough knowledge in orthodontics. For the 241 people who received orthodontic treatment previously, the other common reasons were eliminating the need to travel to the dental office, less treatment time, having enough knowledge of dentistry, and the promise of having the money back if the aligners did not fit.

Among the 285 people who had not received orthodontic treatment, the fourth most common reason was having enough knowledge in dentistry. The fifth most common reason was believing that only the alignment of the front teeth was important. The distance to travel to the dental office was not considered a reason for utilizing DIYO. The main reason to opt for DIYO was financial. Surprisingly enough, the reasons people who had considered DIYO were basically in the same order for people who had received orthodontic treatment before and those who had not. Of the total population, almost a half of them had an annual household income of less than \$100,000 (Figure 2).

When laypeople were asked if they thought there were some risks involved in orthodontic treatment, 244 answers were received. Among the 122 respondents who would consider

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DIYO, the answers were as follows: the first most common risk was tooth mobility/loose teeth, the second was the loss of tooth support/bone loss. Third was that it will not straighten the teeth, the fourth was receding gums/gum disease, the fifth was making overbite worse, and the least most common risk perceived was that orthodontic treatment would make the front teeth stick out. 18 people did not consider any of these as potential risks involved in orthodontic treatment. (Figure 3)

From this point, the survey focused on the group of 122 respondents who answered positively to considering DIYO. Of those 122 people, 91 (75%) thought there were some risks involved in orthodontic treatment, in contrast to 31 (25%) who did not think there were risks involved (Figure 3). 63 (51.6%) out of the 122 people who had considered DIYO had bought clear trays online to straighten their teeth, 49 (77.8%) of the 63 thought there were some risks involved, while 14 (22.2%) of the 63 did not think there were risks involved. However, this was not statistically significant ($p = 0.403$), as shown in Figure 4.

Among the 63 people who bought clear aligners online, 24 of them assumed a GP was evaluating their case, 19 of them assumed an orthodontist was evaluating, 12 of them assumed their own dentist was evaluating, 4 of them assumed the owner of the company was evaluating, and finally 4 more assumed no health care provider was evaluating the case (Figure 5).

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4 When the 122 people who considered DIYO were asked if they considered a clinical
5 evaluation done by a Dentist/Orthodontist, x-rays and other diagnostic records important
6 to plan their orthodontic treatment, 96 (78.7%) people responded positively. 26 (21.3%)
7 out of the 122 did not consider the clinical evaluation, x-rays and other diagnostic records
8 important to plan the orthodontic treatment. 54 of the 63 considered clinical evaluation
9 important. 21 of the 54 presumed that a GP evaluated their case, 17 by an orthodontist,
10 11 by their own dentist, 3 by the owner of the company and 2 by a non-health care
11 provider.
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27 Nine of the 63 did not consider clinical evaluation important. 3 of them presumed that their
28 case was evaluated by a GP, 2 by an orthodontist, 2 by non-health care provider, 1 by
29 their own dentist and 1 by the owner of the company. However, we found this information
30 to be not statistically significant ($p < 0.27$).
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41 Eighty-nine out of the 122 people who responded yes to considering DIYO would be
42 comfortable with orthodontic treatment that does not involve any in-person supervision by
43 a dentist/orthodontist. In contrast, 33 of them would not be comfortable with no
44 dentist/orthodontist supervision. 76 out of the 122 considered a clinical evaluation done
45 by a dentist/orthodontist and diagnostic records important and would be comfortable with
46 orthodontic treatment that does not involve any in-person supervision by a
47 Dentist/Orthodontist. 13 of the 122 people did not consider a clinical evaluation done by
48 a GP/orthodontist, x-rays and other diagnostic means important and would be
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4 comfortable with orthodontic treatment that does not involve any in-person supervision by
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6 a dentist/orthodontist. This was statistically significant ($p = 0.003$), as shown in Figure 6.
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12 In regards to who would be responsible for detecting issues or problems that may occur
13 during DIYO, 90 (73.8%) out of the 122 respondents said they would take the
14 responsibility, 16 (13.1%) would hold the company who sold the aligners responsible, and
15 another 16 people (13.1%) said their dentist would be responsible. 122 people considered
16 doing orthodontic treatment by themselves. 89 of them would be comfortable with
17 orthodontic treatment without supervision by a Dentist/ Orthodontist. 74 of the 89 (83.1%)
18 will take responsibility for the issues or problems that may occur. 10 of the 89 (11.2%)
19 would hold the aligner company responsible, and 5 of the 89 (5.6%) believed their own
20 dentist to be responsible.
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39 Thirty-three people out of the 122 will not be comfortable with orthodontic treatment
40 without supervision by a Dentist/Orthodontist. 16 of the 33 will be responsible for issues
41 or problems that may occur. 11 of the 33 would hold their own dentist responsible, and 6
42 of the 33 will hold the aligner company responsible. This was statistically significant ($p <$
43 0.001) (Figure 7).
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54 **DISCUSSION**

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4 The main objective of the present investigation was to evaluate laypeople preferences
5 and knowledge of orthodontic treatment performed by an orthodontist versus DIYO. In
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7 order to fulfill the aims of this research, the authors designed and implemented an
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9 observational study using a 24-question online survey, which was administered to 526
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11 laypeople without professional experience or background in dentistry and orthodontics.
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13 After analyzing the information gathered, it was found that financial considerations were
14
15 the first and most important reason for laypeople to opt for DIYO. Moreover, it was
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17 established that people who have had orthodontic treatment actually know the difference
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19 between a GP and an orthodontist, whereas people who have not had orthodontic
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21 treatment are less likely to know the difference.
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32 An increase in DIYO has been noted during recent years. Currently, there is a paucity on
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34 studies investigating whether laypeople understand the differences between professional
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36 orthodontic treatment versus DIYO. Moreover, there is no scientific literature examining
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38 the associated risks related to DIYO. Although patients have many motivations to seek
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40 orthodontic treatment, esthetics is by far the main reason to get orthodontic treatment
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42 done. In 2009, for example, a study reported that parents (91.4%) and their children
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44 (93.4%) both graded esthetics as the primary reason to seek orthodontic treatment.¹⁰
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47 More recently, Lin et al., demonstrated that the psychosocial impact of dental esthetics
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49 played an important role in the decision-making process of adults looking for orthodontic
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51 treatment.¹¹ Since the esthetic region of the dentition is mainly the anterior zone, it would
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53 seem natural that some would seek a relatively simple mean to improve this area. This
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4 tendency provides a convenient explanation for the appeal of DIYO, which focuses
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6 entirely on the anterior dentition.
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12 Regarding the reasons why people are increasingly using DIYO; recent studies indicate
13 that reduced cost is the main reason,¹² which is in agreement with our results. This finding
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15 seems to be in harmony with laypeople feeling confident about performing DIYO,
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17 especially when pushed to do so by social media.¹³ For laypeople, who believe they are
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19 fixing a problem, this actually means that the investment is minimal and that they believe
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21 they are savvy enough to pursue this course of action. They are not considering the
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23 inherent risks of their actions. In some cases, the consequences of DIYO can be
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25 devastating, as demonstrated by Froum et al.¹⁴
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36 The clinical presentation of a given orthodontic problem or problems can be deceiving,
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38 which can lead to failures if incorrect diagnosis (or no diagnosis at all) and erratic
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40 treatment plans are designed as a consequence of poor medical/dental history taking.
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42 Orthodontic residents and orthodontists have been shown to have a more accurate
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44 assessment than other dental peers,¹⁵ which does not support laypeople's self-perception
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46 on adequate or appropriate medical/dental/orthodontic knowledge.
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55 As for who provides orthodontic treatment and the reasons why laypeople opt to go to an
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57 orthodontist or utilize DIYO; a recent publication found that people with the highest level
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59 of interest in getting orthodontic treatment will look for an orthodontist, while those with
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4 the least interest prefer DIYO aligners. According to this study, the reason why people
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6 go to an orthodontist is quality of treatment. Our findings are in agreement with this study
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8 in the sense that laypeople opt for DIYO primarily due to costs and convenience, not
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10 quality of care.¹⁶
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18 Another interesting point in this project was the results about who did the orthodontic
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20 treatment and the expectations from laypeople who potentially will utilize DIYO or have
21
22 already used it. Ideal function, ideal esthetics, and long-term stability are not considered
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24 in the DIYO modality. The fact that for some respondents neither the diagnostic records
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26 nor the practitioner is important in their treatment decision-making suggests that only the
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28 appliances are important to them. Indeed, DIYO advertises that the aligners move teeth
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30 faster and at a lower price.
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38 In agreement with Melsen,¹⁷ orthodontics is a patient-oriented profession that must
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40 distinguish between patients who need goal-oriented treatment with individually produced
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42 appliances. As the orthodontic profession has been witnessing the last few years with
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44 DIYO, due to the efforts and pressure of the market, patients are increasingly drawn into
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46 treatment by nonspecialists with “Fast Food Orthodontics,” as DIYO might well be
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48 considered. Considering that nearly 10% of the people who expressed the desire to utilize
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50 DIYO are unsure of what results to expect, and 24 out of 50 who anticipated nearly
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52 desired results still considered utilizing DIYO, should the specialty not be concerned?
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58 (Figure 8)
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Orthodontic treatment is based on the patient, and the profession must resist the temptation to fall prey to the unforgiving jaws of DIYO. More than any other time in history, orthodontists must familiarize themselves with the products offered to the public by non-specialists, so patients can be effectively educated about new treatment modalities; their strengths and their weaknesses, thus helping the patient make an informed decision. Since this field of knowledge started as a modern science during the mid-1800s with the seminal work of Norman William Kingsley and Edward Angle, it has been advocated that it is the knowledge and the science along with the expertise of the orthodontist that ultimately provides the best quality care possible.¹⁸

As to who would be responsible if there was a problem during or after DIYO, 33.3% of people who were not comfortable with orthodontic treatment that does not involve any in-person supervision by a Dentist/Orthodontist would hold their own dentist responsible for any issues with DIYO. By signing the informed consent and the agreement to arbitrate, the client indicates that their dentist has performed a comprehensive dental exam and has determined that the patient is healthy from both a restorative and periodontal perspective.¹⁹ The question is: How are dentists responding to this?

The extensive knowledge gathered by orthodontists over the years has allowed the practitioner to delegate the responsibility of performing most of the adjustments to their assistants. It may be appropriate to spend time educating the public and patients, and to

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4 clarify some misconceptions of the simplicity of orthodontics.¹⁹ One such misconception
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6 is risk. Interestingly, 22.2% of the people who bought clear trays online do not think that
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8 there are risks involved.
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15 For some time, orthodontics has been considered one of the most profitable professions,
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17 overselling and taking advantage of the created, or manufactured, need for better
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19 esthetics and “ideal” occlusion.²⁰ People are interested in attaining this “ideal” as
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21 inexpensively as possible. These two forces, combined with the benefits of technology,
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23 have joined to create DIYO. To conclude, orthodontics has evolved rapidly and has
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25 become clinically easier to deliver. The science behind it, however, cannot be forgotten.
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27 An evidence-based practice instead of a reseller-based orthodontic office is a much-
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29 needed change in our specialty. Ultimately, it is the knowledge and accrued experience
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31 that differentiates an orthodontist from the general public. This study has explored the
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33 reasons behind DIYO and the motives laypeople have for undergoing this modality. The
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35 long-term effects of DIYO, however, remain to be investigated.
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45 **CONCLUSIONS**

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49 Within the limitations of this study, the following conclusions can be drawn:
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52 • Common characteristics among people who have considered DIYO include lower
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54 level of education, low income, lack of knowledge regarding the differences
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56 between a GP and an orthodontist. Women are more likely to utilize DIYO than
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58 men.
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- The main reason why laypeople utilize DIYO is low cost.
- 25% of potential DIYO users and buyers do not consider risks involved and a noticeable portion of them considered their own dentist responsible for detecting issues or problems during treatment.
- Some DIYO users believe there are no risks involved. Moreover, one third of respondents will consider DIYO in the future. (Figure 9)

ACKNOWLEDGEMENTS

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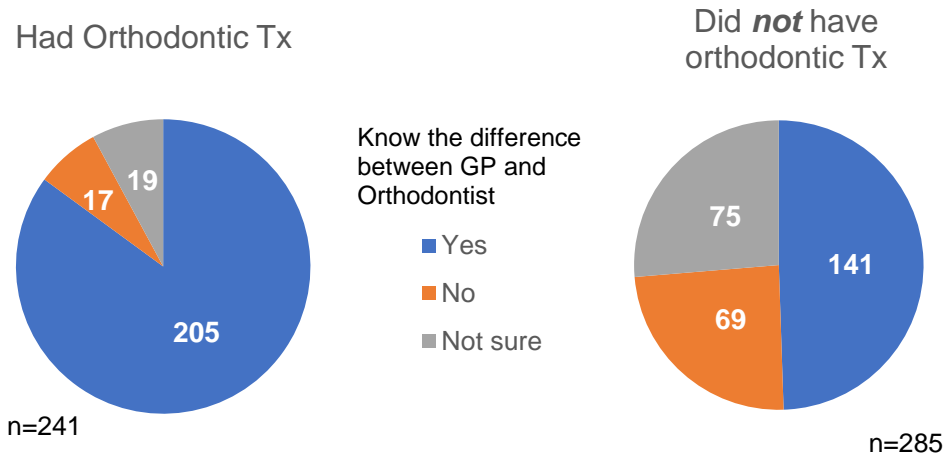


Figure 1. Awareness of the difference between GP and an orthodontist correlates with having prior treatment experience and who provided the treatment (n=526 respondents). ($p < .001$)

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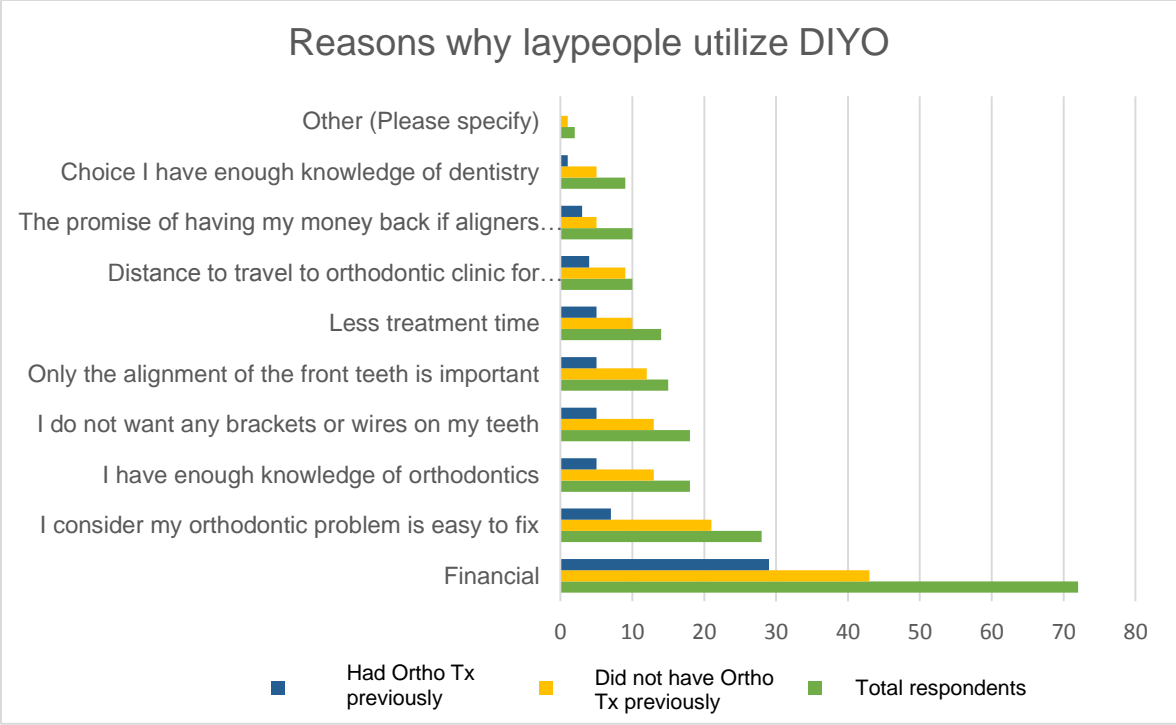


Figure 2. Reasons why laypeople utilize DIYO. (Multiple responses were allowed).

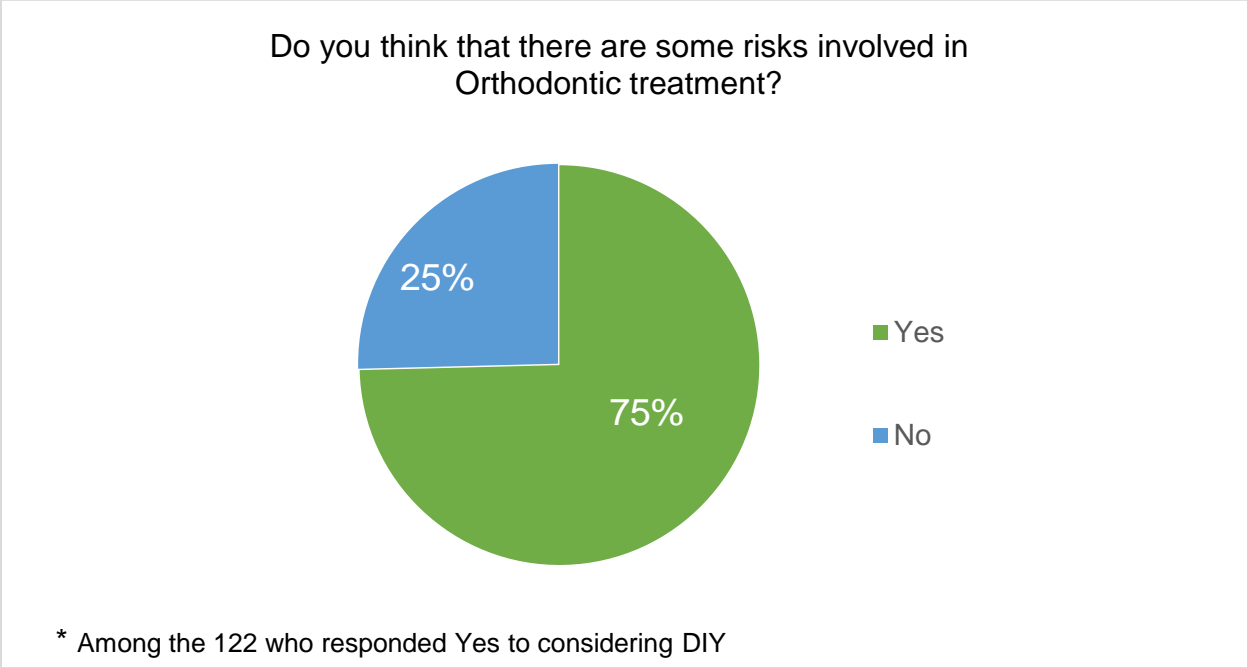
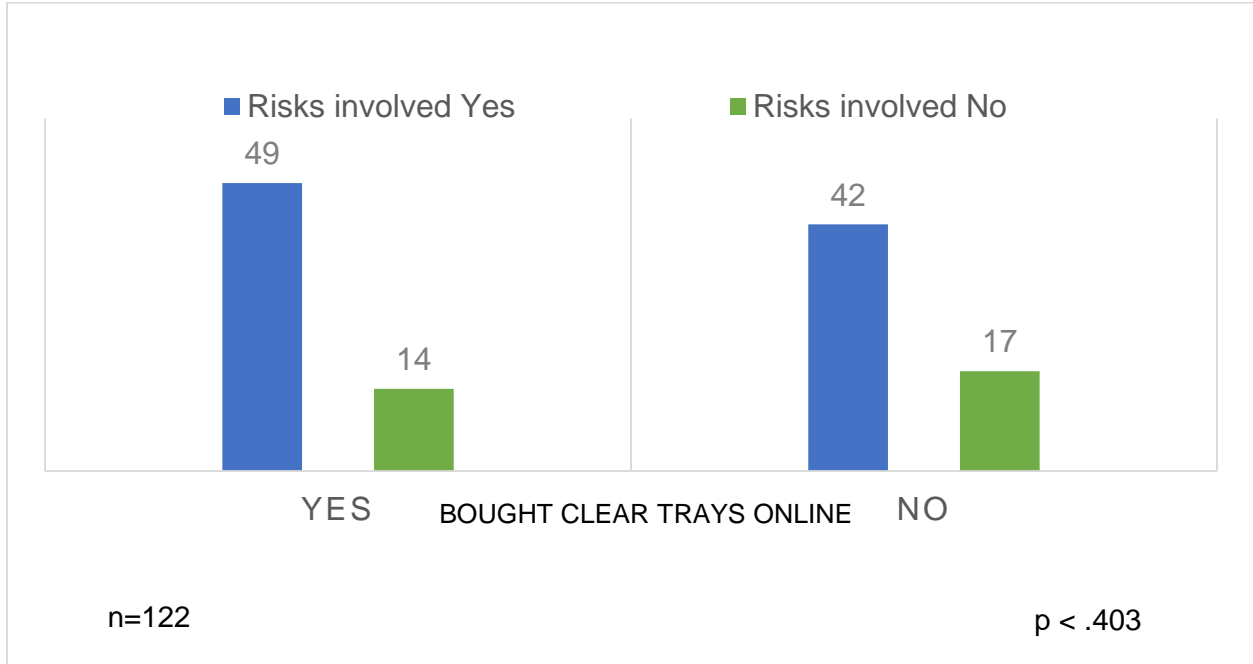


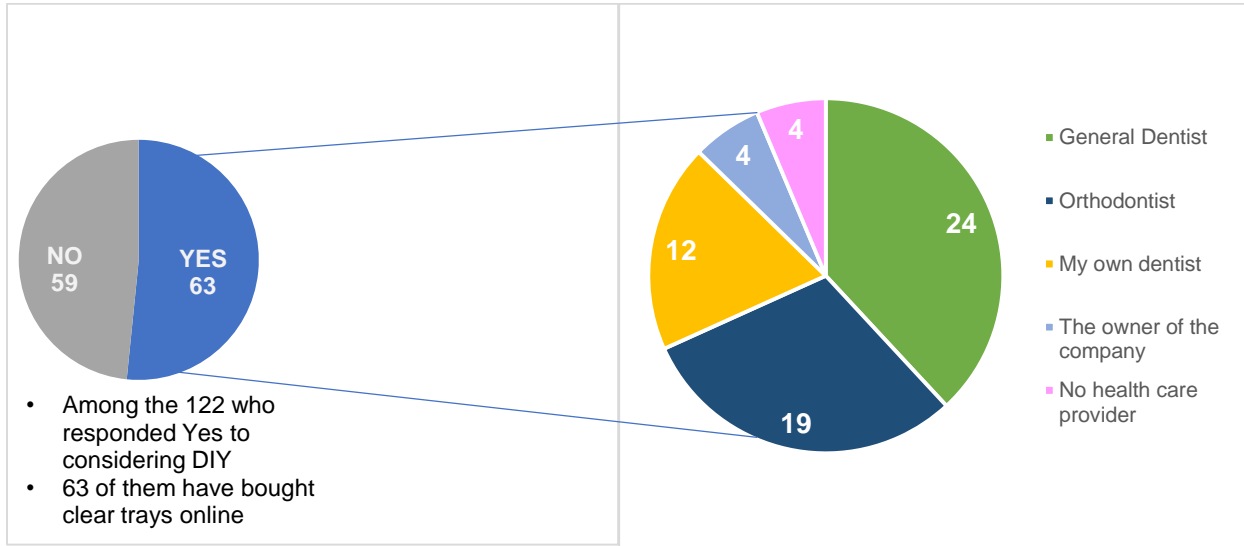
Figure 3. Awareness of risks involved in Orthodontic Treatment

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4 Have you ever bought clear trays online, to straighten your teeth?
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30 Figure 4. Assessment of risks involved for those who bought clear trays online.
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7 What healthcare provider do you presume
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31 Figure 5. Awareness of what healthcare provider lay people presume is evaluating their
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11 Do you consider a clinical evaluation done by a Dentist/Orthodontist, x-rays and other
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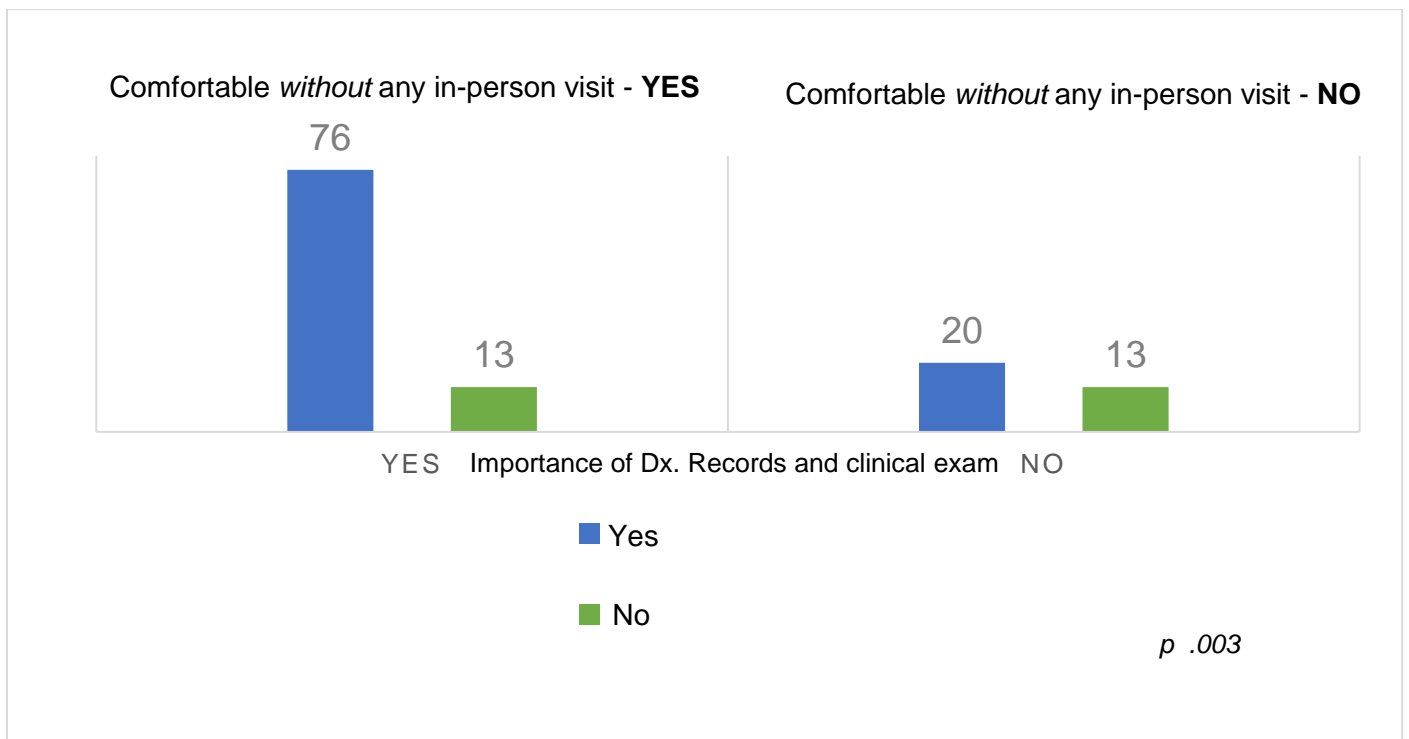


Figure 6. Importance of diagnostic records and comfort without any in-person supervision by dental professional

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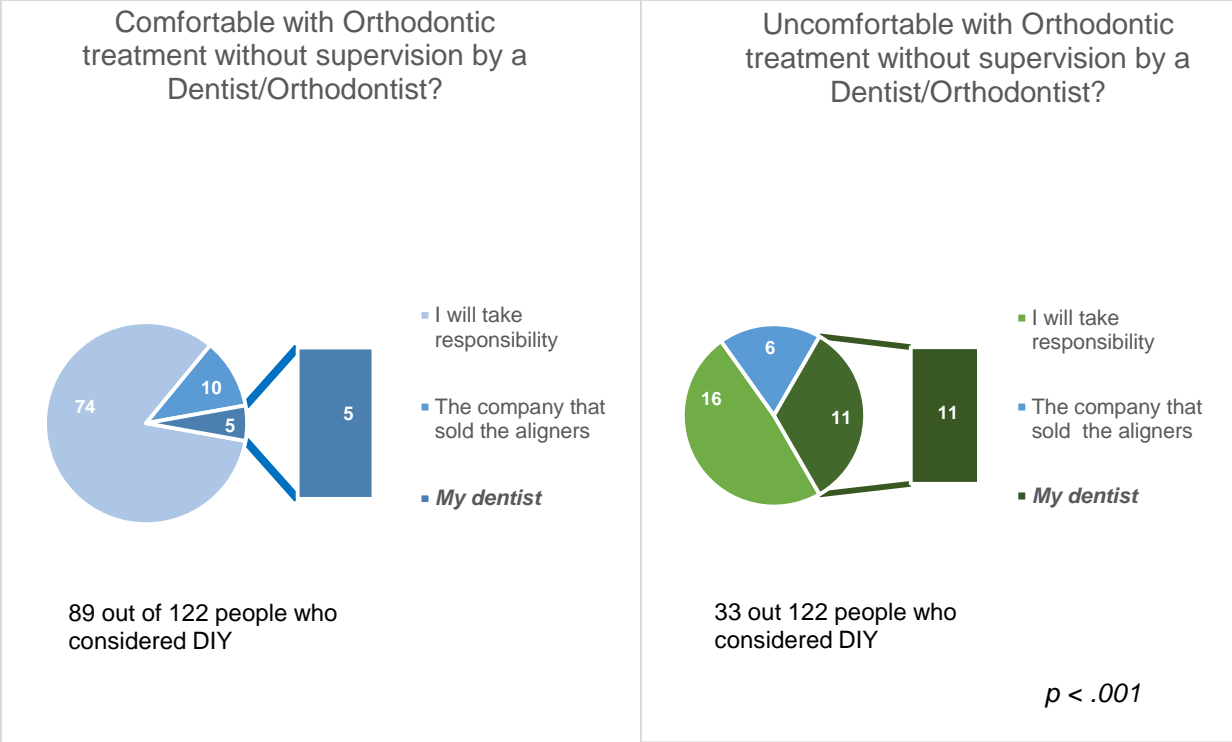
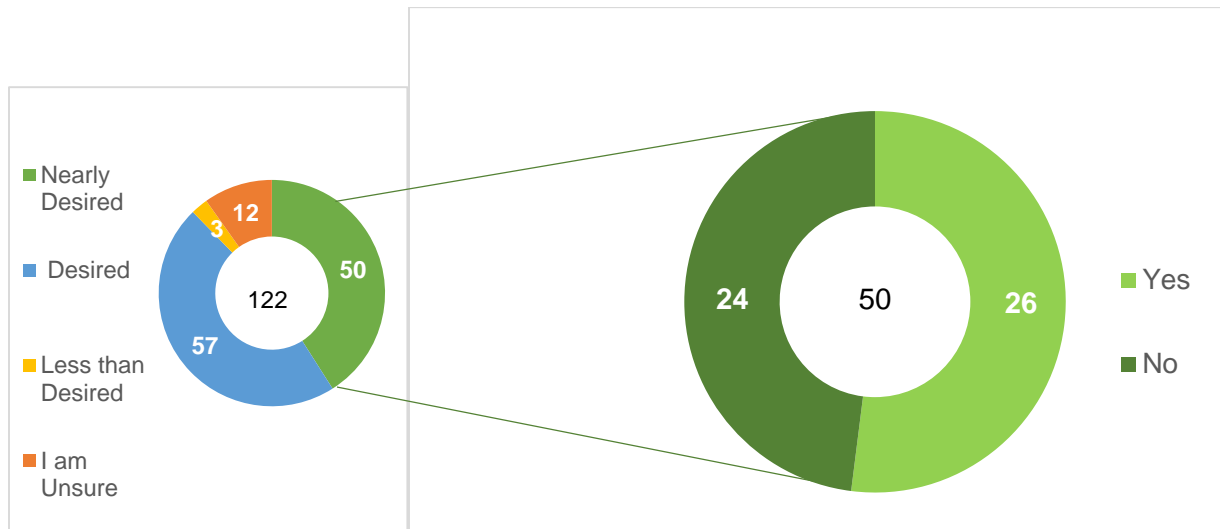


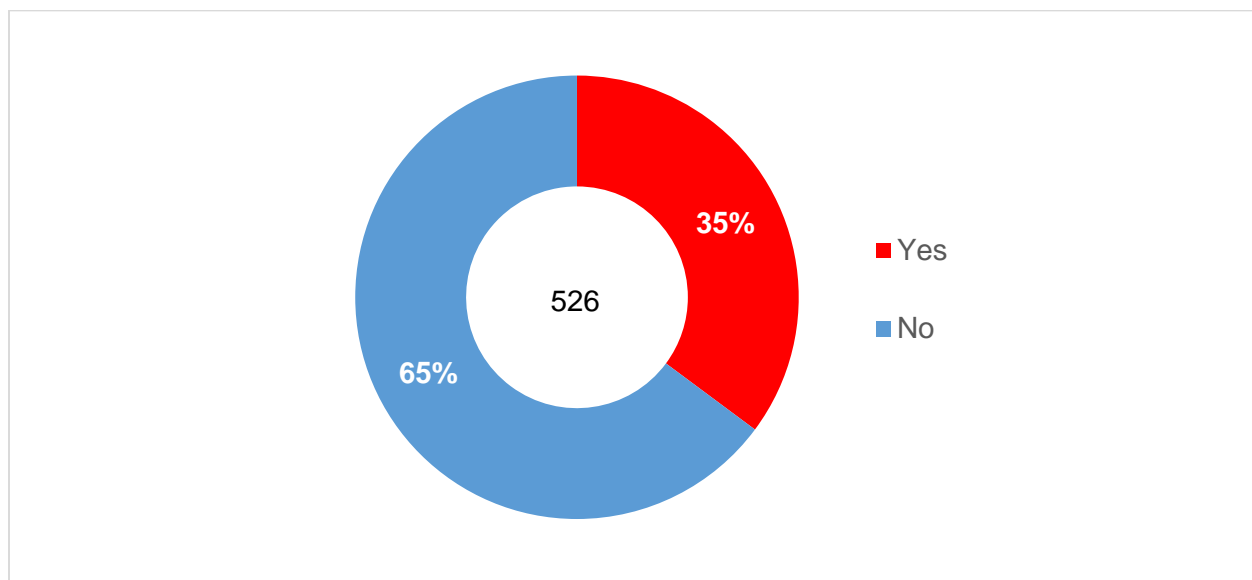
Figure 7. Laypeople assessment of responsibility and level of comfort without any in-person supervision by dental professional.

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4 If you selected "Nearly Desired results",
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6 would you avoid DIY Orthodontic Treatment In the future?
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28 **Figure 8.**
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35 **Would you attempt DIYO Treatment in the future?**
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57 **Figure 9. 35% of the total respondents will attempt DIYO in the future**
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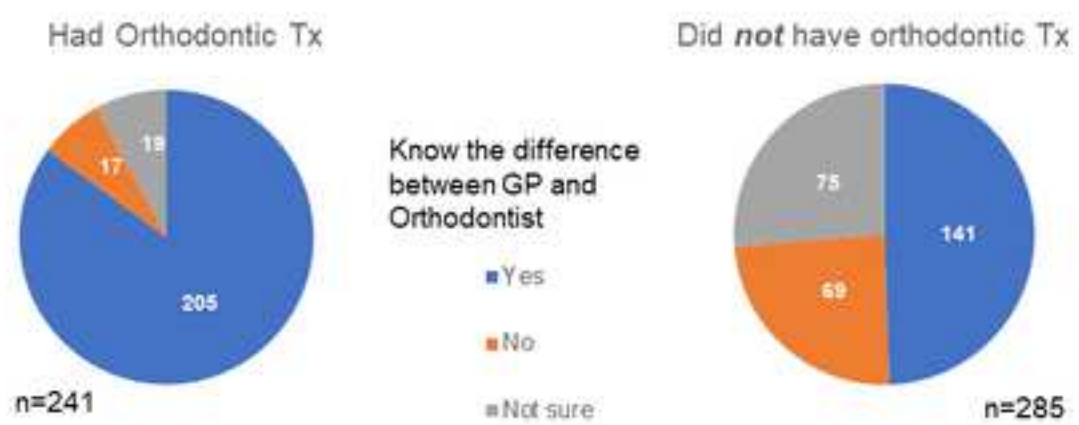


Figure1. Awareness of the difference between GP and an orthodontist correlates with having prior treatment experience and who provided the treatment (n=526 respondents) (p< .001)

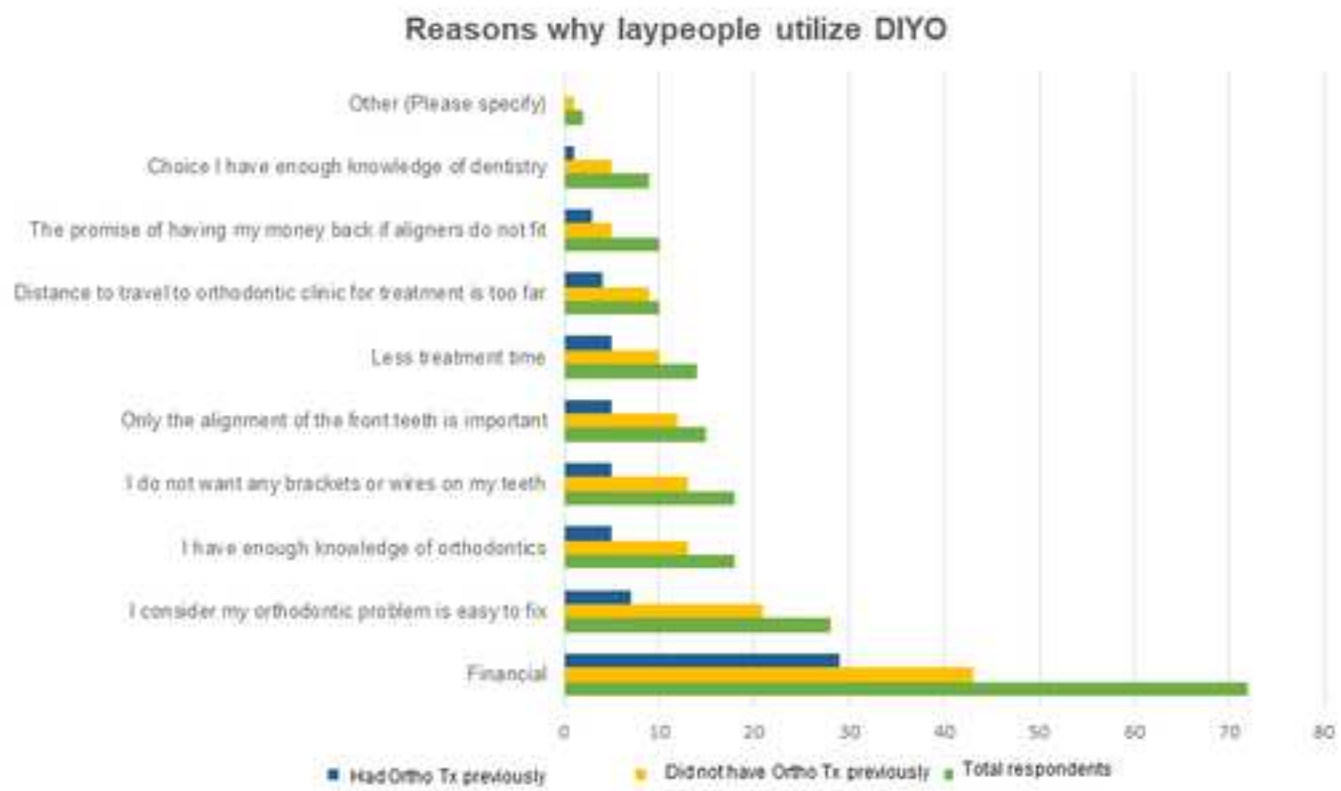
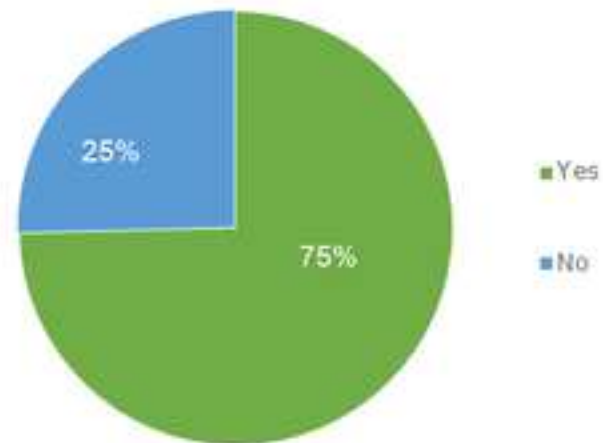


Figure 2. Reasons why laypeople utilize DIYO. (Multiple responses were allowed).

Do you think that there are some risks involved in Orthodontic treatment?



* Among the 122 who responded Yes to considering DIY

Figure 3. Awareness of risks involved in Orthodontic Treatment

Have you ever bought clear trays online, to straighten your teeth?



Figure 4. Assessment of risks involved for those who bought clear trays online.

What healthcare provider do you presume is evaluating your case while DIYO?

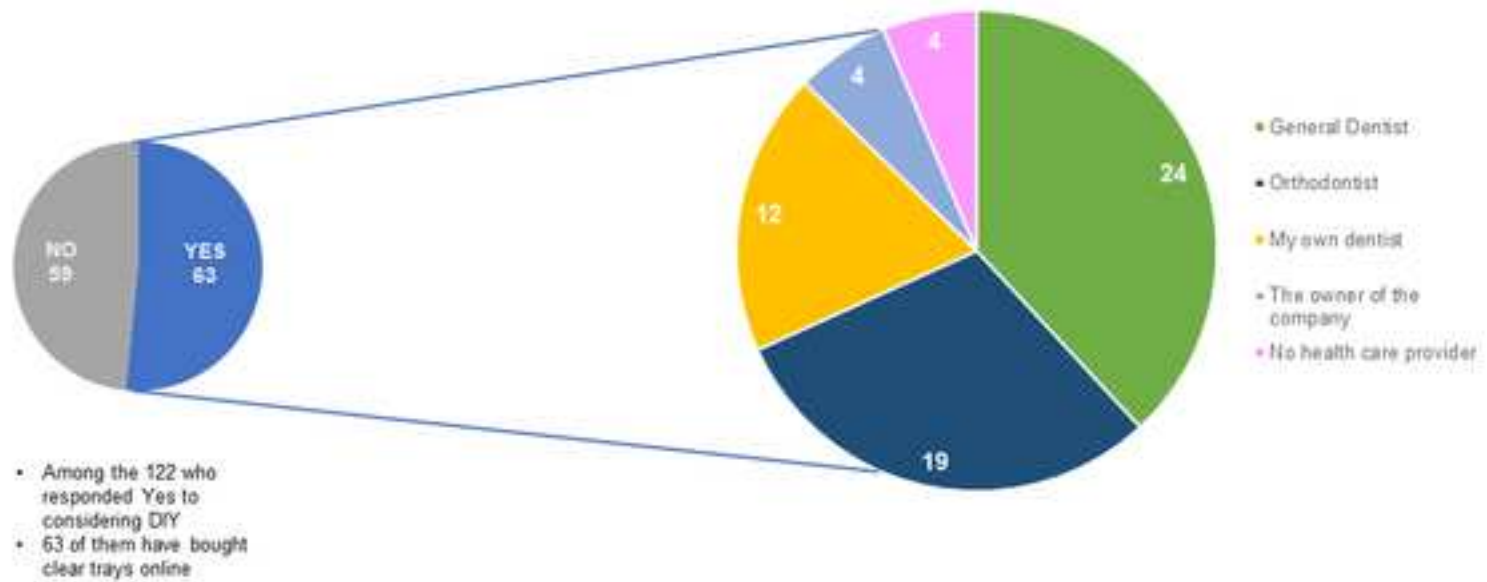


Figure 5. Awareness of what healthcare provider lay people presume is evaluating their case while DIYO

Would you be comfortable with Orthodontic treatment that does not involve any in-person supervision by a Dentist/Orthodontist?
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Do you consider a clinical evaluation done by a Dentist/Orthodontist, x-rays and other diagnostic records important to plan your Orthodontic treatment?

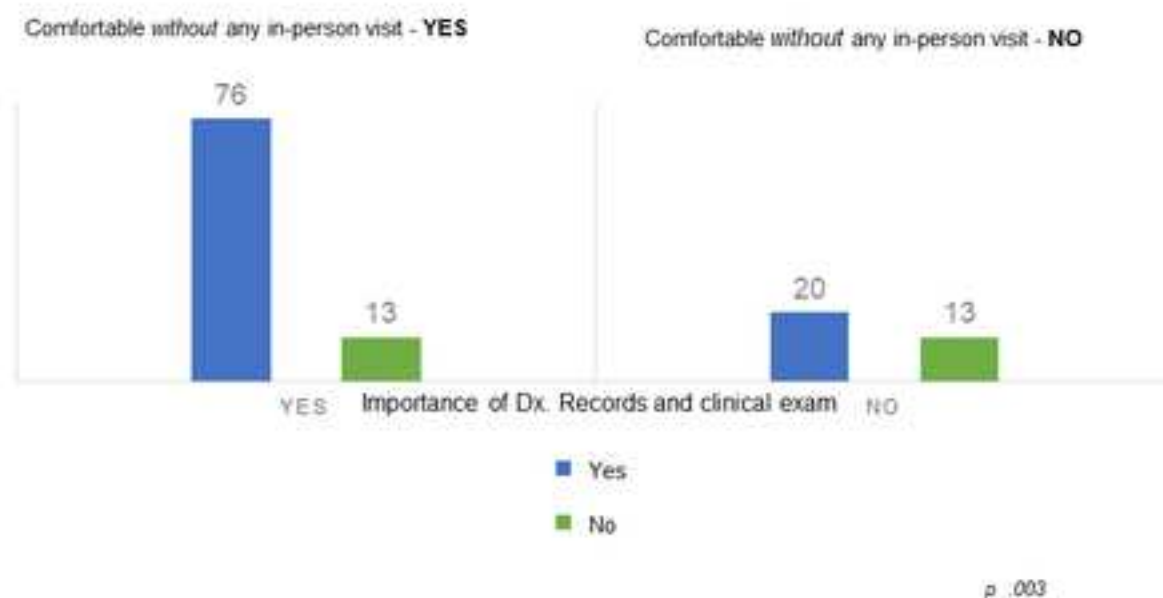


Figure 6. Importance of diagnostic records and comfort without any in-person supervision by dental professional

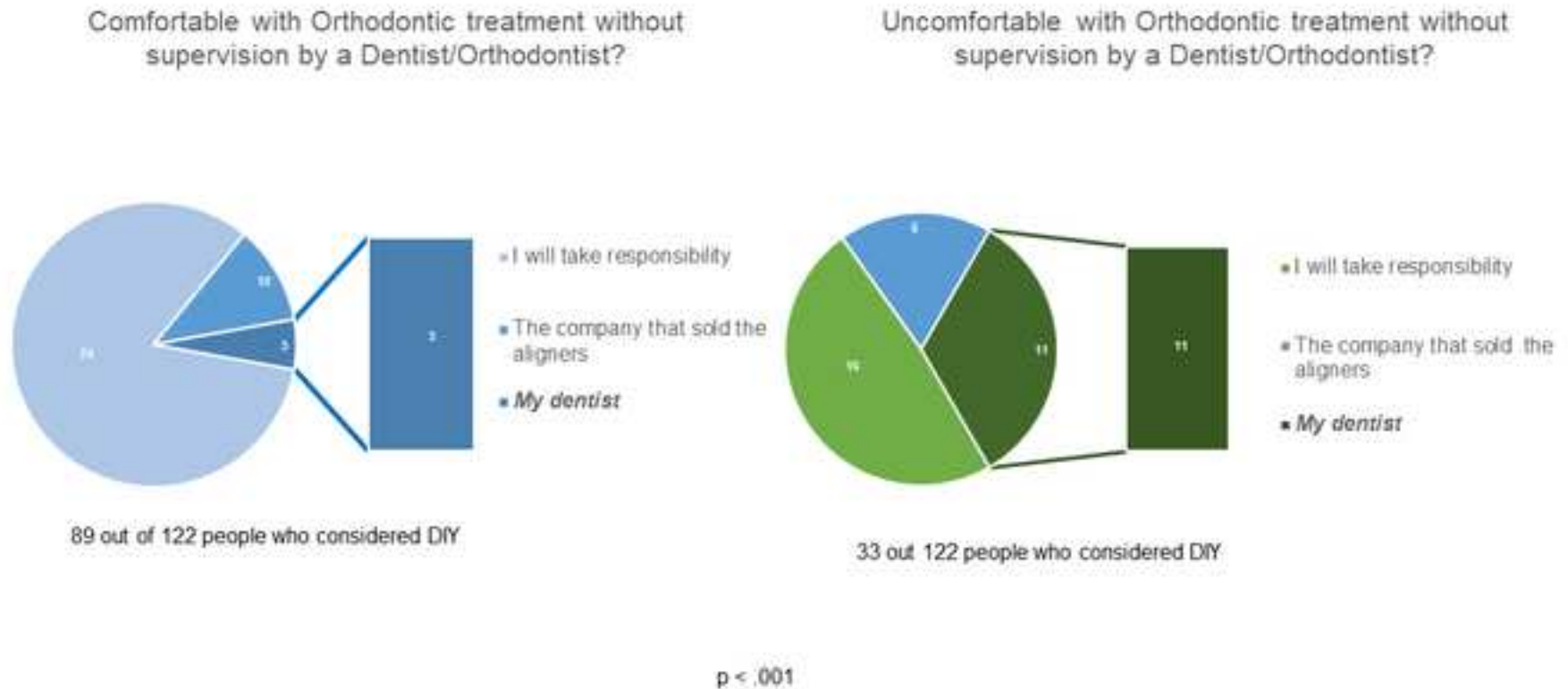


Figure 7. Laypeople assessment of responsibility and level of comfort without any in-person supervision by dental professional.

If you selected "Nearly Desired results", would you avoid DIY Orthodontic Treatment In the future?

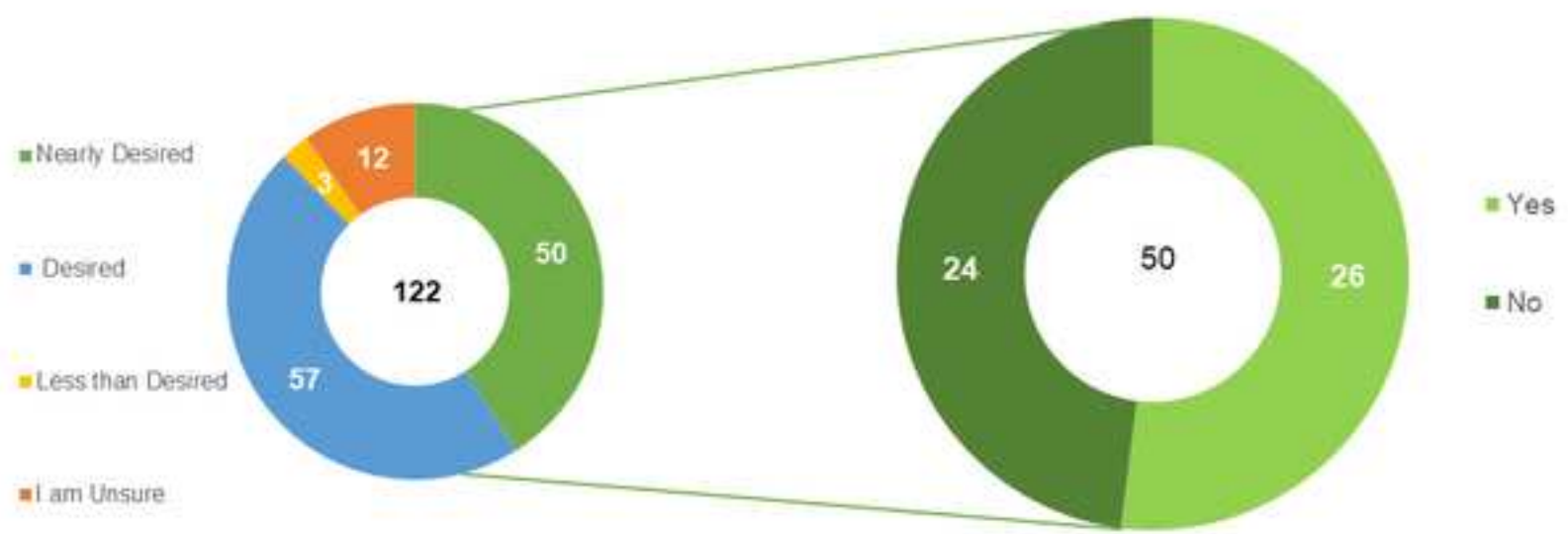


Figure 8.

Would you attempt DIYO Treatment in the future?

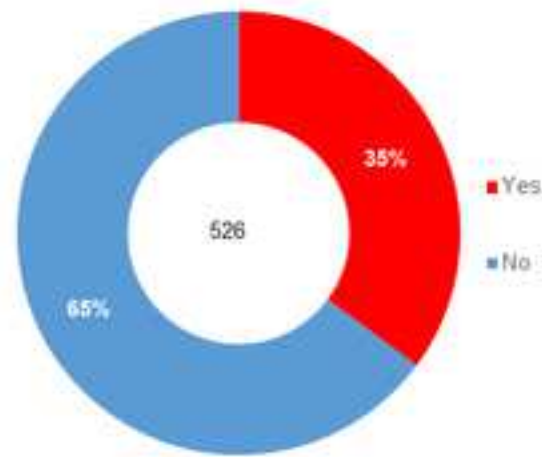


Figure 9. 35% of the total respondents will attempt DIYO in the future

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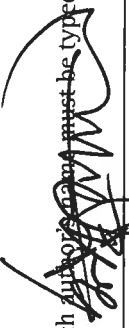
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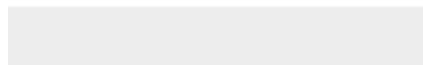
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