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ENDODONTIC COMPLICATIONS: CAUSES, PREVENTIVE STRATEGIES AND THEIR IMPACT ON TREATMENT OUTCOME

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Abstract:

Objective: *This study aims to investigate the causes of endodontic complications, develop evidence-based preventive strategies, and assess their impact on treatment outcomes to enhance the quality and success of endodontic procedures*

Methods: A cross-sectional study design will be implemented to examine the etiology of endodontic complications, identify preventive strategies, and evaluate their effect on treatment outcomes. This approach facilitates the collection of data from a diverse sample at a single point in time, offering a snapshot of the current situation.

Results: *The study comprised 667 participants. The most represented age group was over 45 years (n=157, 24%), followed by those aged 25-30 years (n=142, 21.3%). Females were the majority among the participants (n=364, 54.6%), with males constituting 45.4% (n=303). The highest educational level was a diploma or bachelor's degree (n=455, 68.2%), and the next was high school (n=126, 18.9%). When it came to income, most participants were in the middle bracket (n=507, 76%), with the high-income bracket next (n=85, 12.7%), and the lowest income bracket was the least common (n=75, 11.2%). Regarding satisfaction with their root canal treatment, most participants reported being very satisfied (n=226, 34%), with a neutral response as the next most frequent (n=202, 30%). In terms of complications, the largest group of respondents did not know which complications they encountered (n=334, 46.3%), followed by those reporting pain after surgery (n=242, 33.6%). The most cited source of information was the dentist (n=285, 42.7%).*

Conclusion*: The results suggest that the study's participant demographic primarily included middle-income individuals with at least a diploma or bachelor's degree. Information about endodontic treatments was predominantly provided by dentists. Participants generally reported high satisfaction with root canal treatments and demonstrated robust social communication.*

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INTRODUCTION:

Endodontics, a specialized field within dentistry, focuses on the study and treatment of the dental pulp. Common procedures in this discipline include root canal therapy, endodontic retreatment, surgical interventions, treatment of cracked teeth, and management of dental trauma. However, similar to other medical procedures, endodontic treatments may be accompanied by complications. Therefore, it is crucial to comprehend and alleviate these complications to enhance patient outcomes and overall treatment effectiveness.

Endodontic complications encompass a spectrum of issues, from relatively minor concerns like post-operative pain to more serious problems such as root or canal perforations, instrument breakage, overfilling or underfilling of the root canal, and treatment failure leading to persistent infections [1]. These complications can significantly influence the prognosis of endodontic treatments and may necessitate further interventions [2].

Several factors have been identified as contributors to these complications, including the intricacy of the root canal system, variations in tooth anatomy, the expertise and skill of the practitioner, the types of instruments utilized, and the techniques applied during the procedure [3]. Additionally, patient-related factors such as age, systemic health, and compliance also play a role in treatment outcomes [4].

Despite the extensive research conducted to comprehend and address endodontic complications, there remains an ongoing imperative to delve deeper into these complexities.

iting the delivery of optimal care to patients. Therefore, there is a pressing need for further research that comprehensively evaluates the etiology of endodontic complications and identifies strategies to mitigate their occurrence.

To address these challenges, interdisciplinary research efforts involving clinicians, researchers, and materials scientists can provide valuable insights into the complex interactions between the biological, mechanical, and microbial factors that contribute to endodontic complications. By leveraging advanced imaging techniques, such as micro-computed tomography, and molecular analyses, researchers can gain a deeper understanding of root canal anatomy, dentin microstructure, and the behavior of microorganisms within the root canal system. This knowledge can inform the development of innovative instruments, irrigation solutions, and obturation materials tailored to address the specific challenges encountered during endodontic procedures.

Furthermore, the integration of digital technologies, such as computer-aided design and additive manufacturing, can facilitate the customization of endodontic instruments and materials, potentially reducing the incidence of complications associated with anatomical complexities and variations among patients. Additionally, the implementation of educational programs and continuous professional development initiatives can enhance the proficiency of dental practitioners in managing and preventing endodontic complications through the adoption of best practices and emerging techniques.

By fostering a collaborative approach that encompasses clinical, scientific, and technological perspectives, the field of endodontics can advance towards the development of evidence-based guidelines and protocols aimed at minimizing the occurrence of complications and optimizing treatment outcomes. Ultimately, these efforts can significantly improve patient satisfaction, reduce the economic burden associated with endodontic retreatment, and promote the long-term preservation of natural dentition.

METHODS:

Study Design

This research utilizes a cross-sectional study design to investigate the causes of endodontic complications, identify preventive strategies, and assess their impact on treatment outcomes. A cross-sectional methodology permits concurrent data collection from a varied subject pool, providing an overview of the status quo.

Study Setting

The study will be conducted across a range of dental healthcare facilities, encompassing dental clinics, private practices, and institutions that provide endodontic treatments. Sites will include both urban and suburban areas to capture a demographically representative sample.

Study Population

The study will target individuals who have received endodontic treatments for various dental conditions. The inclusion criteria span a broad spectrum of ages, genders, and socioeconomic statuses.

Study Sample

Stratified random sampling will be adopted to select participants. Dental facilities will be categorized based on their geographic location as either urban or suburban. Within each category, a random sample of clinics will be chosen, and participants will be proportionally recruited from these clinics.

Study Instrument

Data collection will be facilitated through the use of a structured questionnaire, which has been carefully developed as the primary study instrument.

Data Collection

Participant data will be gathered through a combination of patient interviews, clinical examinations, and reviews of dental records. The structured questionnaire is designed to collect comprehensive demographic data, detailed treatment histories, and patient-reported experiences of complications.

Data Analysis

Descriptive statistics will summarize the study population's demographic characteristics, including age, gender, and socioeconomic status. Appropriate measures such as means, medians, standard deviations, and percentages will be calculated. Bivariate analysis will be conducted to probe the causes of endodontic complications, with the Chi-square test or Fisher's exact test applied to examine associations between demographic factors and complication rates. Logistic regression will be used to identify potential risk factors for specific complications.

In assessing preventive strategies, these will be categorized and analyzed descriptively to determine their implementation frequency. The adoption of preventive measures will be explored using regression analysis or other suitable statistical methods.

To evaluate the preventive strategies' effectiveness on treatment outcomes, multivariate analysis will be employed. Logistic regression models will be adjusted for confounders to ascertain the efficacy of these strategies in reducing complications and enhancing treatment success. Subgroup analysis will delve into demographic and other pertinent factors that may influence complications and outcomes. Statistical software, such as SPSS or R, will be utilized for analysis, with a significance threshold set at $p < 0.05$.

Ethical Considerations

Eligible participants will include those who have completed endodontic treatment. Exclusion criteria will encompass individuals with incomplete treatment records or those with systemic conditions that could potentially confound treatment outcomes.

RESULTS:

The study included 667 participants. The predominant age group was those over 45 years (n=157, 24%), followed by the 25-30 year age bracket (n=142, 21.3%). Figure 1 illustrates the age distribution of the participants. In terms of gender distribution, females were the majority (n=364, 54.6%), with males comprising 45.4% of the study population (n=303). Figure 2 depicts the gender distribution among the participants.

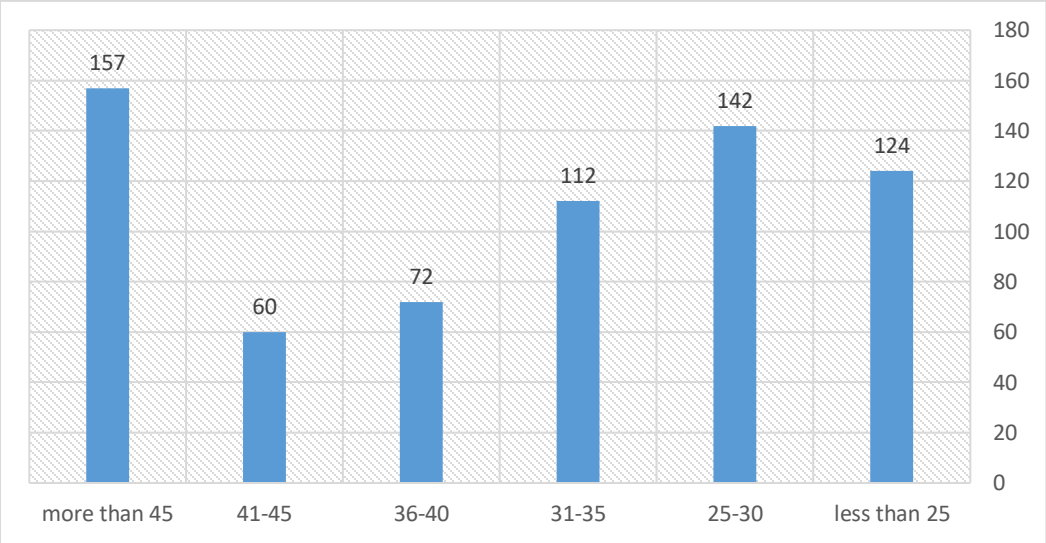

Figure 1: Age distribution among study participants

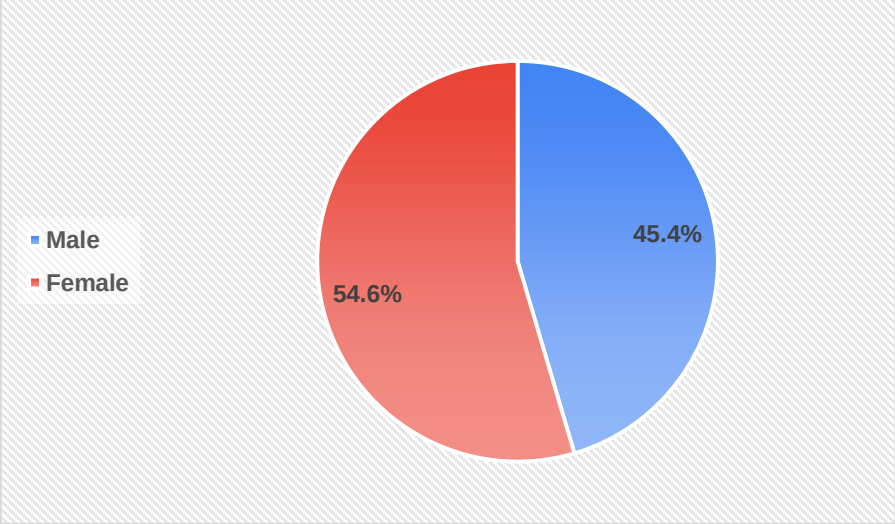

Figure 2: Gender distribution among study participants

Study participants' most frequent educational level was diploma/bachelor degree (n= 455, 68.2 %) followed by high school (n= 126, 18.9%). Figure 3 shows the educational level among study participants.

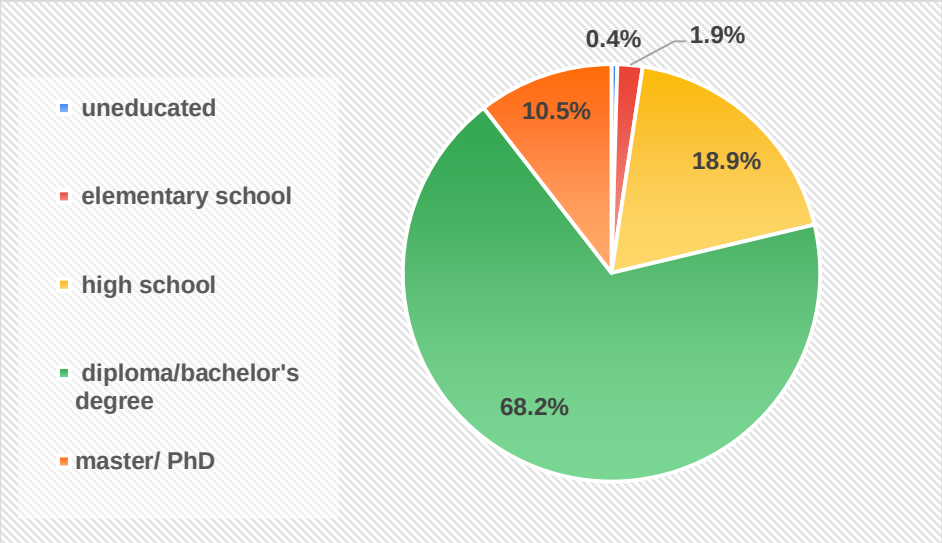

Figure 3: educational level among study participants

The income level of study participants, with most of them middle (n= 507, 76%) followed by high level (n= 85, 12.7%), and the least common income level was weak (n= 75, 11.2%). The income level among study participants is shown in Figure 4.

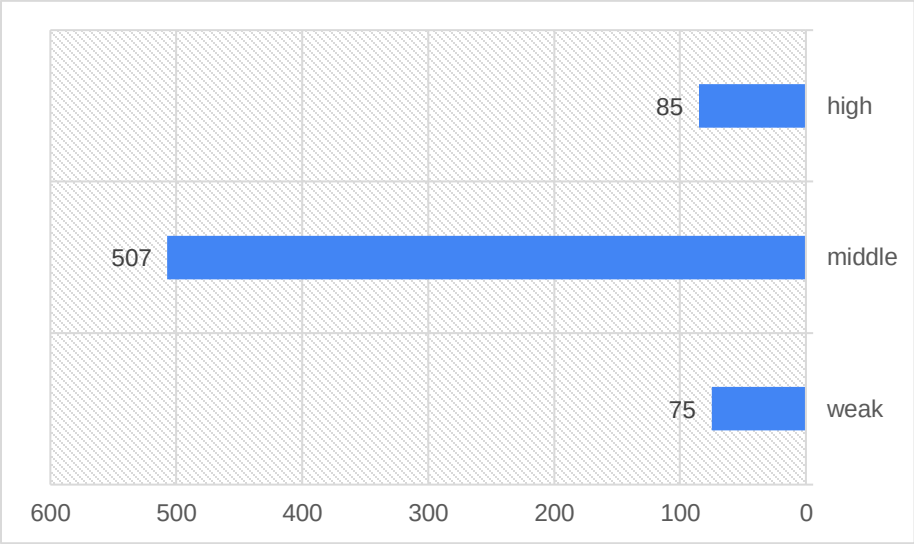

Figure 4: income level distribution among study participants

Participants were asked How satisfied they were with their overall experience with root canal treatment. Most of the frequencies answered very satisfied (n=226, 34%), followed by neutral (n=202, 30%). Figure 5 shows the frequencies of the participants satisfied with the root canal treatment experience.

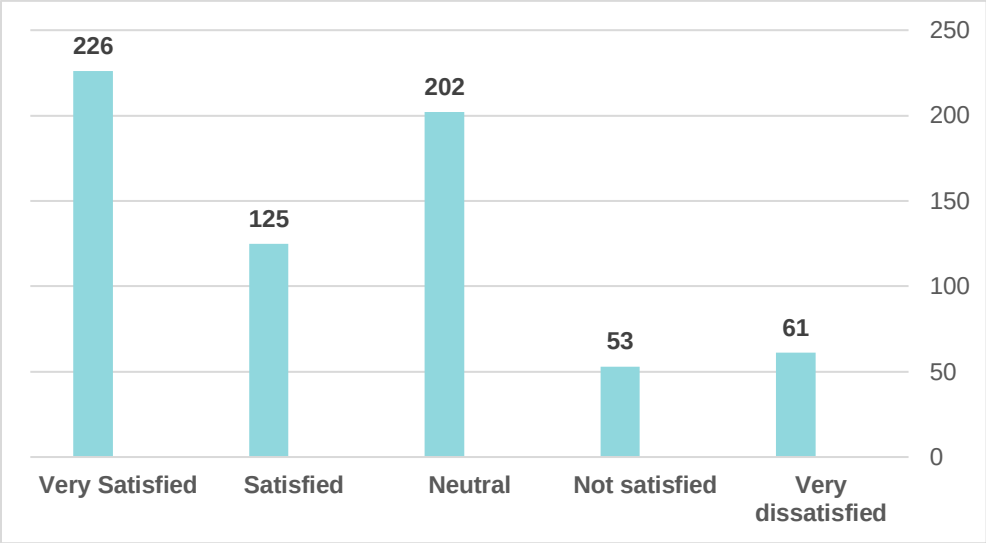

Figure 5: frequencies of the participants satisfied with root canal treatment experience

Participants were asked about the complications of root canal treatment among study participants. Their responses and results are presented in Table 1.

Table 1: complications of root canal treatment among study participants

scale item	yes	no
Have you previously undergone endodontic treatment?	402	265
	60.3%	39.7%
Did you know complications may arise during or after root canal treatment?	397	270
	59.5%	40.5%
Can you identify the signs and symptoms that may indicate complications after root canal treatment?	397	270
	59.5%	40.5%
Have you received information about prevention strategies to avoid complications before root canal treatment?	204	463
	30.6%	69.4%
Have you personally experienced any complications after undergoing endodontic treatment?	243	424
	36.4%	63.6%
Would you like to learn more about prevention strategies to reduce complications of endodontic treatment?	526	141
	78.9%	21.1%

Participants were asked to determine which complications they encountered. Most answers were they don't know (n=334, 46.3%), followed by pain after surgery (n=242, 33.6%).
Participants were asked to specify the source of information. The most frequent was from the dentist (n=285, 42.7%). Figure 6 shows the participants' source of information.

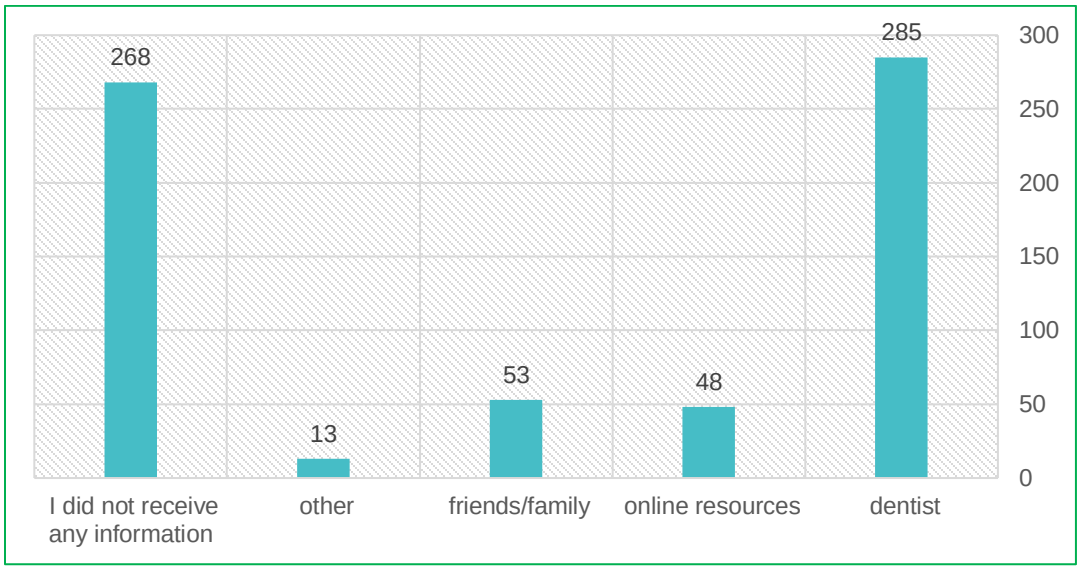

Figure 6: source of information among study participants

DISCUSSION:

Endodontic treatments stand out for their high rate of success, despite the procedural intricacies involved in navigating the complex dental anatomy. However, complications can surface during or after root canal procedures, often due to an incomplete understanding of the anatomical nuances or from iatrogenic errors, which are predominantly encountered during the instrumentation stage. While certain complications are predictable to some extent, a substantial portion remains unpredictable, adding a layer of complexity to the treatment [5-7]. The specialization of endodontic retreatment has become an essential area of expertise within the field, providing effective solutions to these complications through both surgical and nonsurgical interventions [8]. Root canal failures are frequently attributed to chronic bacterial infections or subsequent reinfections. Key factors implicated in endodontic failure include inadequate canal shaping, cleaning, obturation techniques, compromised restorations, and structural failures such as fractures leading to leakage. The optimal course of treatment is determined based on the root cause of the reinfection and the particular zones affected. Notably, persistent infections have been identified as the main culprits in immediate endodontic failures [9].

CONCLUSION:

The study's outcomes reveal that the majority of the participants fall within the middle-income bracket and possess educational qualifications up to the diploma or bachelor's degree level, and Information dissemination regarding endodontic treatments predominantly occurs through their dental practitioners. Participants also favored root canal treatment and exhibited strong capabilities in social communication, facilitating their access to and sharing of healthcare information.

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ANNEX 1: DATA COLLECTION TOOL

1. How old are you?
   - less than 25
   - 25-30
   - 31-35
   - 36-40
   - 41-45
   - More than 45

2. What is your education level?
   - uneducated
   - elementary school
   - high school
   - diploma/bachelor's degree
   - master/ PhD

3. What is your income level?
   - weak
   - middle
   - high

4. Have you previously undergone endodontic treatment?
   - Yes
   - No

5. Did you know complications may arise during or after root canal treatment?
   - Yes
   - No

6. Determine which complications you are familiar which
   - Pain after surgery
   - Infection
   - Broken treatment tool
   - Other
   - I don’t know

7. Can you identify the signs and symptoms that may indicate complications after root canal treatment?
    - Yes
    - No

8. Please identify the signs and symptoms that you are aware of
    - Swelling
    - Constant pain
    - Prolonged sensitivity
    - Discharge or pus
    - Change in tooth color
    - other
    - I don't know

9. Have you received information about prevention strategies to avoid complications before undergoing root canal treatment?
    - Yes
    - No

10. Please specify the source of the information
    - dentist
    - online resources
    - friends/family
    - other
    - I did not receive any information

11. Have you personally experienced any complications after undergoing endodontic treatment?
    - Yes
    - no

12. How satisfied are you with your overall experience with root canal treatment?
    - Very dissatisfied
    - Not satisfied
    - Neutral
    - Satisfied
    - Very Satisfied

13. Would you like to learn more about prevention strategies to reduce complications of endodontic treatment?
    - Yes
    - No

14. Determine which complications that you are encountered
    - Pain after surgery
    - Infection
    - Broken treatment tool
    - hole
    - Other
    - I don't know

APPENDIX 2: Participants responses to scale items

Participant's responses to survey scale items						
	Very dissatisfied	Not satisfied	Neutral	Satisfied	Very Satisfied	total
How satisfied are you with your overall experience with root canal treatment?	61	53	202	125	226	667
	9%	8%	30%	19%	34%	100%

age	frequency	Percent
less than 25	124	18.6%
25-30	142	21.3%
31-35	112	16.8%
36-40	72	10.8%
41-45	60	9.0%
more than 45	157	24%

gender	frequency	percent
Male	303	45.4%
Female	364	54.6%

income level	frequency	percent
weak	75	11.2%
middle	507	76.0%
high	85	12.7%

education level	frequency	percent
uneducated	3	0.4%
elementary school	13	1.9%
high school	126	18.9%
diploma/bachelor's degree	455	68.2%
master/ PhD	70	10.5%

source of information	frequency	percent
dentist	285	42.7%
online resources	48	7.2%
friends/family	53	7.9%
other	13	1.9%
I did not receive any information	268	40.2%

	Pain after surgery	Infection	Broken treatment tool	other	I don't know
Determine which complications you are familiar which	418	81	83	58	196
	50.0%	9.7%	9.9%	6.9%	23.4%

others				
inflammation	swelling	abscess	nerve	total
6	7	3	3	19
31.6%	36.8%	15.8%	15.8%	100%

There were 19 participants who answered specific answers to choose other

	swelling	constant pain	prolonged sensitivity	Discharge or pus	change in tooth color	other	I don't know	total
Please identify the signs and symptoms that you are aware of	367	266	128	150	135	15	141	1202
	30.5%	22.1%	10.6%	12.5%	11.2%	1.2%	11.7%	100.0%

Some of them chose more than one answer

	Very dissatisfied	Not satisfied	Neutral	Satisfied	Very Satisfied	total
How satisfied are you with your overall experience with root canal treatment?	61	53	202	125	226	667
	9%	8%	30%	19%	34%	100%

	Pain after surgery	Infection	Broken treatment tool	hole	**other**	I don't know	total
Determine which complications that you are encountered	242	19	34	38	54	334	721
	33.6%	2.6%	4.7%	5.3%	7.5%	46.3%	100.0%

Table 1: complications of root canal treatment among study participants

scale item	yes	no
Have you previously undergone endodontic treatment?	402	265
	60.3%	39.7%
Did you know complications may arise during or after root canal treatment?	397	270
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Have you personally experienced any complications after undergoing endodontic treatment?	243	424
	36.4%	63.6%
Would you like to learn more about prevention strategies to reduce complications of endodontic treatment?	526	141
	78.9%	21.1%

SPSS
Complications (Pain after surgery)

age * Pain after surgery Crosstabulation

Count

		Pain after surgery		Total
		yes	no	
age	1	24	100	124
	2	44	98	142
	3	42	70	112
	4	30	42	72
	5	30	30	60
	6	72	85	157
Total		242	425	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	29.180[a]	5	.000	.[b]		
Likelihood Ratio	30.416	5	.000	.[b]		
Fisher's Exact Test	.[b]			.[b]		
Linear-by-Linear Association	25.351[c]	1	.000	.000	.000	.000
N of Valid Cases	667					

Crosstab

Count

		Pain after surgery		Total
		yes	no	
gender	Male	102	201	303
	Female	140	224	364
Total		242	425	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.647[a]	1	.199	.225	.115	
Continuity Correction[b]	1.446	1	.229			
Likelihood Ratio	1.651	1	.199	.225	.115	
Fisher's Exact Test				.225	.115	
Linear-by-Linear Association	1.644[c]	1	.200	.225	.115	.028
N of Valid Cases	667					

Crosstab

Count

		Pain after surgery		Total
		yes	no	
Educational level	uneducated	0	3	3
	elementary	5	8	13
	high school	53	73	126
	diploma/bachelors degree	156	299	455
	master/PhD	28	42	70
Total		242	425	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.760[a]	4	.313	.312		
Likelihood Ratio	5.720	4	.221	.264		
Fisher's Exact Test	4.389			.339		
Linear-by-Linear Association	.065[b]	1	.799	.848	.424	.049
N of Valid Cases	667					

Crosstab

Count

		Pain after surgery		Total
		yes	no	
Income level	weak	25	50	75
	middle	192	315	507
	high	25	60	85
Total		242	425	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.570[a]	2	.277	.277		
Likelihood Ratio	2.626	2	.269	.275		
Fisher's Exact Test	2.512			.280		
Linear-by-Linear Association	.356[b]	1	.551	.566	.304	.055
N of Valid Cases	667					

Complications (Infection)

Age * infection Crosstabulation

Count

		infection		Total
		yes	no	
Age	1	1	123	124
	2	3	139	142
	3	3	109	112
	4	1	71	72
	5	2	58	60
	6	9	148	157
Total		19	648	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.482[a]	5	.187	.181		
Likelihood Ratio	7.308	5	.199	.259		
Fisher's Exact Test	6.361			.230		
Linear-by-Linear Association	5.923[b]	1	.015	.015	.009	.003
N of Valid Cases	667					

Crosstab

Count

		infection		Total
		yes	no	
gender	Male	8	295	303
	Female	11	353	364
Total		19	648	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.087[a]	1	.768	.819	.478	
Continuity Correction[b]	.004	1	.951			
Likelihood Ratio	.087	1	.767	.819	.478	
Fisher's Exact Test				.819	.478	
Linear-by-Linear Association	.087[c]	1	.768	.819	.478	.178
N of Valid Cases	667					

Crosstab

Count

		infection		Total
		yes	no	
Educational level	uneducated	0	3	3
	elementary	0	13	13
	high school	4	122	126
	diploma/bachelors degree	12	443	455
	master/PhD	3	67	70
Total		19	648	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.113[a]	4	.892	.888		
Likelihood Ratio	1.500	4	.827	.856		
Fisher's Exact Test	1.862			.729		
Linear-by-Linear Association	.348[b]	1	.555	.583	.350	.131
N of Valid Cases	667					

Crosstab

Count

		infection		Total
		yes	no	
Income level	weak	1	74	75
	middle	12	495	507
	high	6	79	85
Total		19	648	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	6.492[a]	2	.039	.034		
Likelihood Ratio	5.112	2	.078	.149		
Fisher's Exact Test	5.247			.056		
Linear-by-Linear Association	5.018[b]	1	.025	.033	.022	.016
N of Valid Cases	667					

Complications (Broken treatment tool)

age * Broken treatment tool Crosstabulation

Count

		Broken treatment tool		Total
		yes	no	
age	1	6	118	124
	2	7	135	142
	3	6	106	112
	4	4	68	72
	5	3	57	60
	6	8	149	157
Total		34	633	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.073[a]	5	1.000	1.000		
Likelihood Ratio	.073	5	1.000	1.000		
Fisher's Exact Test	.294			1.000		
Linear-by-Linear Association	.011[b]	1	.917	.924	.476	.038
N of Valid Cases	667					

Crosstab

Count

		Broken treatment tool		Total
		yes	no	
gender	Male	12	291	303
	Female	22	342	364
Total		34	633	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.484[a]	1	.223	.289	.149	
Continuity Correction[b]	1.084	1	.298			
Likelihood Ratio	1.512	1	.219	.289	.149	
Fisher's Exact Test				.289	.149	
Linear-by-Linear Association	1.482[c]	1	.224	.289	.149	.068
N of Valid Cases	667					

Crosstab

Count

		Broken treatment tool		Total
		yes	no	
Educational level	uneducated	0	3	3
	elementary	0	13	13
	high school	5	121	126
	diploma/bachelors degree	26	429	455
	master/PhD	3	67	70
Total		34	633	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.645[a]	4	.801	.731		
Likelihood Ratio	2.478	4	.649	.664		
Fisher's Exact Test	.991			.908		
Linear-by-Linear Association	.547[b]	1	.459	.486	.278	.089
N of Valid Cases	667					

Crosstab

Count

		Broken treatment tool		Total
		yes	no	
Income level	weak	3	72	75
	middle	23	484	507
	high	8	77	85
Total		34	633	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.787[a]	2	.151	.153		
Likelihood Ratio	3.189	2	.203	.243		
Fisher's Exact Test	3.493			.169		
Linear-by-Linear Association	2.603[b]	1	.107	.148	.075	.039
N of Valid Cases	667					

Complications (Hole)

Age * Hole Crosstabulation

Count

		Hole		Total
		yes	no	
Age	1	5	119	124
	2	8	134	142
	3	6	106	112
	4	7	65	72
	5	5	55	60
	6	7	150	157
Total		38	629	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	4.060[a]	5	.541	.543		
Likelihood Ratio	3.713	5	.591	.614		
Fisher's Exact Test	4.086			.531		
Linear-by-Linear Association	.163[b]	1	.686	.717	.359	.033
N of Valid Cases	667					

Crosstab

Count

		Hole		Total
		yes	no	
gender	Male	16	287	303
	Female	22	342	364
Total		38	629	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.179[a]	1	.672	.739	.401	
Continuity Correction[b]	.065	1	.798			
Likelihood Ratio	.180	1	.671	.739	.401	
Fisher's Exact Test				.739	.401	
Linear-by-Linear Association	.179[c]	1	.672	.739	.401	.122
N of Valid Cases	667					

Crosstab

Count

		Hole		Total
		yes	no	
Educational level	uneducated	0	3	3
	elementary	0	13	13
	high school	9	117	126
	diploma/bachelors degree	25	430	455
	master/PhD	4	66	70
Total		38	629	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	1.492[a]	4	.828	.781		
Likelihood Ratio	2.368	4	.668	.698		
Fisher's Exact Test	1.118			.859		
Linear-by-Linear Association	.002[b]	1	.961	1.000	.542	.107
N of Valid Cases	667					

Crosstab

Count

		Hole		Total
		yes	no	
Income level	weak	7	68	75
	middle	24	483	507
	high	7	78	85
Total		38	629	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.741[a]	2	.154	.159		
Likelihood Ratio	3.392	2	.183	.198		
Fisher's Exact Test	4.063			.126		
Linear-by-Linear Association	.038[b]	1	.846	.865	.491	.134
N of Valid Cases	667					

Complications (Other)

age * other Crosstabulation

Count

		other		Total
		yes	no	
age	1	15	109	124
	2	16	126	142
	3	8	104	112
	4	5	67	72
	5	3	57	60
	6	7	150	157
Total		54	613	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	8.417[a]	5	.135	.133		
Likelihood Ratio	8.527	5	.129	.141		
Fisher's Exact Test	8.070			.144		
Linear-by-Linear Association	7.769[b]	1	.005	.005	.003	.001
N of Valid Cases	667					

Crosstab

Count

		other		Total
		yes	no	
gender	Male	24	279	303
	Female	30	334	364
Total		54	613	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.023[a]	1	.880	.888	.498	
Continuity Correction[b]	.000	1	.993			
Likelihood Ratio	.023	1	.880	.888	.498	
Fisher's Exact Test				1.000	.498	
Linear-by-Linear Association	.023[c]	1	.880	.888	.498	.112
N of Valid Cases	667					

Crosstab

Count

		other		Total
		yes	no	
Educational level	uneducated	0	3	3
	elementary	0	13	13
	high school	13	113	126
	diploma/bachelors degree	37	418	455
	master/PhD	4	66	70
Total		54	613	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	2.780[a]	4	.595	.566		
Likelihood Ratio	4.067	4	.397	.406		
Fisher's Exact Test	1.879			.697		
Linear-by-Linear Association	.136[b]	1	.712	.734	.393	.083
N of Valid Cases	667					

Crosstab

Count

		other		Total
		yes	no	
Income level	weak	6	69	75
	middle	42	465	507
	high	6	79	85
Total		54	613	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.148[a]	2	.929	.970		
Likelihood Ratio	.153	2	.926	.970		
Fisher's Exact Test	.094			.970		
Linear-by-Linear Association	.055[b]	1	.815	.885	.464	.113
N of Valid Cases	667					

Complications (Don’t know)

age * Don’t know Crosstabulation

Count

		Don’t know		Total
		yes	no	
age	1	81	43	124
	2	74	68	142
	3	55	57	112
	4	30	42	72
	5	26	34	60
	6	68	89	157
Total		334	333	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	17.809[a]	5	.003	.003		
Likelihood Ratio	18.019	5	.003	.[b]		
Fisher's Exact Test	17.885			.003		
Linear-by-Linear Association	13.337[c]	1	.000	.000	.000	.000
N of Valid Cases	667					

Crosstab

Count

		Don't know		Total
		yes	no	
gender	Male	163	140	303
	Female	171	193	364
Total		334	333	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	3.074[a]	1	.080	.087	.047	
Continuity Correction[b]	2.807	1	.094			
Likelihood Ratio	3.077	1	.079	.087	.047	
Fisher's Exact Test				.087	.047	
Linear-by-Linear Association	3.069[c]	1	.080	.087	.047	.013
N of Valid Cases	667					

Crosstab

Count

		Don't know		Total
		yes	no	
Educational level	uneducated	3	0	3
	elementary	8	5	13
	high school	53	73	126
	diploma/bachelors degree	235	220	455
	master/PhD	35	35	70
Total		334	333	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	7.360[a]	4	.118	.109		
Likelihood Ratio	8.539	4	.074	.092		
Fisher's Exact Test	6.960			.122		
Linear-by-Linear Association	.100[b]	1	.751	.758	.399	.047
N of Valid Cases	667					

Crosstab

Count

		Don't know		Total
		yes	no	
Income level	weak	39	36	75
	middle	252	255	507
	high	43	42	85
Total		334	333	667

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)	Point Probability
Pearson Chi-Square	.148[a]	2	.929	.930		
Likelihood Ratio	.148	2	.929	.930		
Fisher's Exact Test	.159			.930		
Linear-by-Linear Association	.025[b]	1	.873	.875	.468	.062
N of Valid Cases	667					

Correlation

Correlations

Control Variables			gender	Educational level	Income level	age
pain after surgery, infection , broken treatment, hole, other, don't know	gender	Correlation	1.000	.017	.081	.001
		Significance (2-tailed)	.	.655	.036	.978
		df	0	659	659	659
	Educational level	Correlation	.017	1.000	.219	-.087-
		Significance (2-tailed)	.655	.	.000	.026
		df	659	0	659	659
	Income level	Correlation	.081	.219	1.000	.112
		Significance (2-tailed)	.036	.000	.	.004
		df	659	659	0	659
	age	Correlation	.001	-.087-	.112	1.000
		Significance (2-tailed)	.978	.026	.004	.
		df	659	659	659	0