

Economic Resilience of Dental Practices in the Covid-19 Pandemic: Analysis of the T/E (Turnover/Employee) Indicator

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ABSTRACT

The present study analyzes the impact of the Covid-19 pandemic on the financial performance of dental practices in Bucharest, using the key financial indicator T/E (turnover/employees), which is defined as the ratio between turnover and the number of employees. Financial data were obtained from the Ministry of Finance of Romania for the period 2019–2021 and the dental practices were grouped into two categories: $T/E < 100,000$ RON per employee and $T/E \geq 100,000$ RON per employee in 2019. The results show a significant decrease in some financial indicators such as turnover, revenues and the number of employees in 2020, followed by a strong rebound in 2021. Dental practices with a higher T/E before the pandemic proved to be more resilient, experiencing greater financial growth post-pandemic. The analysis emphasizes the importance of optimal organization of human and financial resources during crises. The T/E parameter has proven useful in assessing economic efficiency, allowing for objective comparisons between dental practices. These results provide new insights for dental professionals, emphasizing the lessons learned from both the past and the present to enhance economic resilience in future crises.

Keywords: economic resilience, T/E key financial indicator, financial performance, Covid-19 pandemic.

INTRODUCTION

Dental practices worldwide experienced an economic shock during the COVID-19 pandemic (1). Many dental practices were losing money because of the limited services that were applied, focusing primarily on emergencies (2). While patient visits to dental of-

fice dropped, the expenses with personal protective equipment (PPE) rose. (3). The protocols for infection became a priority, increasing treatment times and overall costs (4). Thus, once known, the financial stability was challenged because of the expense growth and income declines (5). No matter the status of once dental practices, the negative economic effect extended to all (6). In response, dentists focused at optimizing their

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business by managing staff and explore alternative services (7).

Several articles mention the negative economic effect. In a bi-country survey, Tariq *et al* evaluated the financial damage on dentists in Pakistan and the United Arab Emirates (1). In their study, most respondents faced considerable decreases in patient flow and higher PPE costs, and perceived limited economic support from governing bodies. In Romania, Radoi *et al* highlighted an important decrease in revenue for dental offices in Bucharest (2). Their data revealed that small dental practices, in particular, were struggling because of limited external support and lower cash reserves. In a related Romanian study, Imre and colleagues demonstrated that private practice owners faced significant difficulties meeting routine expenses, often resorting to staff layoffs (3).

Workforce confidence and workflow changes were further scrutinized in the American Dental Association–led study by Liu *et al* (4). Most dentists surveyed adopted more rigorous safety measures, driving up operating costs, while patient volumes lagged pre-pandemic levels. Farrokhi *et al* took a broader perspective in their scoping review, documenting that the global dental market saw reduced profitability and persistent financial instability (5).

Nigro *et al* analyzed post-COVID-19 dental practice management, suggesting operational strategies like varied patient scheduling and cost containment measures to bolster economic resilience (6). In Germany, Wolf *et al* demonstrated that almost one-third of dentists witnessed a collapse or partial closure of their practices and a large fraction struggled with mounting overheads (7). Staff turnover intention, documented by Dayal and Verma, increased sharply as many dental professionals felt insecure in their roles and considered leaving their positions amid uncertainty (8).

Turkish private-practice dentists also reported negative financial outcomes. Karaaslan *et al* found that PPE-related costs remained persistently high, prompting many dentists to consider fee increases or reduced staffing (9). A similar pattern occurred in Brazil, as evidenced by

Villarim *et al*, where stricter biosafety protocols led to growing practice expenses and fewer patient appointments (10).

Apart from financial matters, service availability shifted. Guo *et al* documented a 38% decline in non-urgent dental visits and a reorientation toward emergency treatments in China (11). Benzian *et al* discussed the concept of essential oral health care, underscoring that routine and preventive services often became unavailable during lockdowns (12). Amato *et al* underscored the need for rigorous infection control measures in routine treatments, a factor that inevitably pushed up costs and elongated chair times (13).

Finally, the fears and concerns of providers themselves cannot be overstated. Kinariwala and coauthors observed that many Indian dentists felt unprepared to cope with the pandemic's legal and health-related uncertainties (14). Their apprehensions included limited access to quality PPE, fear of viral exposure, and uncertainty about patient willingness to return.

Taken together, these studies portray a comprehensive narrative of financial strain and organizational challenges across different nations. Dental practices attempted to safeguard employees, maintain services, and uphold care standards. The turnover per employee (T/E) indicator emerges as a vital metric to capture economic resilience in this dynamic environment. However, published work focusing on T/E is sparse (2, 9). Therefore, the present study aims to investigate how T/E behaved under pandemic conditions, clarifying the balance between revenue generation and staffing costs. In doing so, it contributes practical insights for strategic planning and crisis management in oral health care settings. □

MATERIAL AND METHODS

The data was obtained from the official website of the Ministry of Finance of Romania. On this website, financial and identification data for all economic agents registered in Romania are available. This source was used because it provides the most unbiased financial data, and the Ministry of Finance calculates the final taxes for each financial agent in Romania based on these

data. The data used represent the most reliable public source of financial indicators for companies in Romania, with all other sets of financial data being based on it (2, 3).

To extract exclusively data on dental practices from the Ministry of Finance's website, CAEN code 8623, assigned to dental services, was used (2, 3).

The present study was conducted with data from the country's capital (Bucharest), considering that approximately one-quarter of the dental practices in Romania are located in Bucharest, Romania (2, 3).

The inclusion criteria included practices in Bucharest that operated using data from the period 2017–2021 and fall under CAEN code 8623 for dental services (2, 3).

The financial indicators analyzed included turnover, profit, number of employees, debts, revenues and expenses (2, 3).

Statistical analysis was performed using IBM SPSS Statistics 25, and data visualization was carried out with Microsoft Office Excel 2013. The variables were classified as either quantitative or qualitative; qualitative data were presented as frequencies or percentages, while quantitative data were subjected to the Shapiro-Wilk normality test. Results were presented as mean $\pm$ standard deviation (SD) or median with interquartile range, depending on the data distribution. Friedman tests and post-hoc Dunn-Bonferroni tests were used to analyze groups over time, and the Mann-Whitney U test was applied to independent groups. In cases with high data dispersion, box-plot representations were resized for better interpretation. The threshold for statistical significance was set at $p < 0.05$ (2, 3).

Development of a new financial parameter, T/E

In addition to the classic financial parameters already mentioned, a new financial indicator was developed, defined as T/E (from English – turnover/employees) – a ratio consisting of turnover divided by the number of employees. The development of the T/E indicator serves as an aid in evaluating the performance of dental practices, providing a clearer picture of the efficiency in

using human resources to generate revenue. In the context of the present study, T/E was developed to complement traditional financial indicators, such as profit and revenue, which, although essential, do not fully reflect the economic and managerial reality of a practice.

The importance of the T/E indicator lies in its ability to provide a detailed picture of employee productivity. In the dental sector, where direct interaction with patients and the quality of services are crucial, T/E allows for identifying the efficiency of the medical team in managing the volume of patients and the dental services offered. A high T/E indicates that each employee contributes to generating a high turnover, ultimately leading to strong business performance.

Furthermore, this parameter makes it easier to compare the evolution of different dental practices, despite of their size. Thus, dentists can identify effective management strategies based on concrete data derived from the results of this study.

The T/E ratio gives a detailed analysis of the average turnover and the average number of employees within dental practices. The average number of employees calculated for each dental practice was 2.36, so the average number of employees was considered to be 3. Regarding turnover per employee, a value of 100,000 RON per employee was chosen as the representative average for the year 2019. This amount was determined by analyzing financial data collected from various dental practices, where it was observed that 100,000 RON per employee represents approximately the average turnover per employee for 2019. Thus, it was possible to standardize the T/E indicator and make comparisons among the analyzed practices, regardless of their size. $\square$

RESULTS AND DISCUSSIONS

Analysis of dental practices with $T/E \leq 100,000$ RON/employee in 2019

In this section, the financial performance of dental practices with a T/E ratio $\leq 100,000$ RON per employee in 2019 will be analyzed. The analysis will evaluate the financial characteristics of these practices to identify economic vulnerabilities

TABLE 1. Comparison of financial parameters between 2019-2020-2021 in companies with T/E ≤ 100,000 RON/employee in 2019

Turnover/year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	146551.21 ± 214028.55	92580 (48144-167441)	1.92	<0.001*
2020 (p<0.001**)	164856.73 ± 273031.9	92887 (45730-168014.75)	1.64	
2021 (p<0.001**)	228514.52 ± 414406.92	125273 (58514-214673)	2.44	
Post-hoc comparison				
Dif-2019-2020	-18305.52 ± 153976.82	4214 (-23528.25 – 26693.25)	-	<0.001***
Dif-2020-2021	-63657.79 ± 173135.58	-23139 (-64485.25 – -1736.25)	-	<0.001***
Dif-2019-2021	-81963.31 ± 304478.36	-18396.5 (-78053.75 – 10772)	-	<0.001***
Profit/year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	9899.77 ± 79623.37	3535 (-14560 – 24876.5)	1.76	<0.001*
2020 (p<0.001**)	24277.55 ± 101791.31	5901 (-7949 – 37572)	1.93	
2021 (p<0.001**)	46847.87 ± 149275.56	14752 (0-55110.5)	2.31	
Post-hoc comparison				
Dif-2019-2020	-14377.78 ± 100685.36	-3941 (-28725.75 – 14369.75)	-	0.015***
Dif-2020-2021	-22570.31 ± 81024.79	-10776.6 (-40791.25 – 6082.5)	-	<0.001***
Dif-2019-2021	-36948.09 ± 147496.05	-14168 (-50617 – 5727.5)	-	<0.001***
Number of employees per year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	2.5 ± 2.753	2 (1-3)	2.28	<0.001*
2020 (p<0.001**)	2.11 ± 2.334	1 (1-2)	1.89	
2021 (p<0.001**)	2.045 ± 2.204	1 (1-2)	1.83	
Post-hoc comparison				
Dif-2019-2020	0.39 ± 1.01	0 (0-1)	-	<0.001***
Dif-2020-2021	0.065 ± 0.8	0 (0-0)	-	1.000***
Dif-2019-2021	0.455 ± 1.35	0 (0-1)	-	<0.001***
Debts/year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	110943.58 ± 197931.91	44067 (9457-138045.75)	1.97	0.089*
2020 (p<0.001**)	118177.89 ± 221683.3	42062.5 (9481.25-132593.25)	2.08	
2021 (p<0.001**)	118247.25 ± 233969.02	37280.5 (8011.25-127028.25)	1.95	
Revenue/year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	152148.5 ± 221726.88	94003.5 (49022-172868.5)	1.88	<0.001*
2020 (p<0.001**)	173059.27 ± 281136.5	99987.5 (47951.25-184062.25)	1.71	
2021 (p<0.001**)	235388.68 ± 419504.43	128408 (62340-224810.75)	2.41	
Post-hoc comparison				
Dif-2019-2020	-20910.77 ± 161728.4	2482 (-30274.75 – 24638.5)	-	0.014***
Dif-2020-2021	-62329.4 ± 174237.96	-21505 (-64312.25 - -24)	-	<0.001***
Dif-2019-2021	-83240.17 ± 309561.78	-18391.5 (-80320 – 11535.25)	-	<0.001***
Expenses/year (N=508)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	140634.16 ± 175420.63	92517.5 (50938.5 – 164000)	2.01	<0.001*
2020 (p<0.001**)	147067.15 ± 213219.82	88509 (45217.75 – 159439.25)	1.74	
2021 (p<0.001**)	186179.76 ± 309589.23	101270 (49559-179933.75)	2.25	
Post-hoc comparison				
Dif-2019-2020	-6432.99 ± 97548.65	4193 (-14431 – 20880)	-	<0.001***
Dif-2020-2021	-39112.6 ± 128520.75	-10344.5 (-35999.5 -3997)	-	<0.001***
Dif-2019-2021	-45545.59 ± 204647.39	-4349.5 (-38883.75 – 16274)	-	<0.001***
T/E /year (N=443)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	56597.17 ± 24160.92	55530 (38206-76357)	1.68	<0.001*
2020 (p<0.001**)	79318.3 ± 73668.49	62180 (39413-95685)	1.80	
2021 (p<0.001**)	107606.21 ± 114919.61	77626 (49200-136501)	2.52	
Post-hoc comparison				
Dif-2019-2020	-22721.13 ± 68164.11	-4398 (-30092 – 7644)	-	0.242***
Dif-2020-2021	-28287.9 ± 69752.14	-14873.37 (-43081 – -1019.3)	-	<0.001***
Dif-2019-2021	-51009.04 ± 109738.34	-21829 (-72894 – 160)	-	<0.001***

*related-samples Friedman's two-way analysis of variance by ranks test; **Shapiro-Wilk test;

***post-hoc Dunn-Bonferroni test.

and their impact during the pre-pandemic, pandemic and post-pandemic periods.

The data in Table 1 show the comparison of financial indicators between the years 2019,

2020 and 2021 in practices with a T/E ratio of < 100,000 RON *per employee* in 2019. Out of the 1,626 practices active in 2019, 2020 and 2021, 1,088 had T/E values calculated in 2019 (number of employees > 0, turnover > 0). Among these, 508 practices had < 100,000 RON *per employee* (46.69%) and 580 practices $\geq$ 100,000 RON *per employee* (53.31%). The results indicate that most indicators (with the exception of debts, $p = 0.089$) were significantly different between the years according to the Friedman tests ($p < 0.05$). The post-hoc tests reveal elements that will be discussed in the following section.

The analysis of the financial performance of dental practices with a T/E ratio of < 100,000 RON *per employee* in 2019, over the pre-pandemic, pandemic and post-pandemic periods, reveals a series of trends in the face of the economic challenges posed by the Covid-19 pandemic. The evolution of each financial indicator over the three years (2019, 2020, 2021) will now be presented for dental practices with a T/E ratio of < 100,000 RON *per employee* in 2019.

Evolution of turnover

The turnover of the analyzed dental practices experienced fluctuations across the pre-pandemic, pandemic and post-pandemic periods. In 2020, the pandemic year, turnover decreased significantly compared to 2019. This decline in 2020 can be directly attributed to the economic impact of the pandemic, which reduced the activities of dental practices due to restrictions and isolation measures. However, the year 2021 showed a strong rebound, indicating an economic recovery in the post-pandemic context, as reflected by a turnover that exceeded the 2019 levels.

Evolution of profit

The profit of the analyzed dental practices followed a rising trend, with an increase in 2021 compared to previous years. In 2020, profit also was higher comparative to 2019, resulting in an adaptation of the economic profile of dental practices in the pandemic. Hence, the management strategies applied by the management

team worked and resulted in the increase of the profit in 2020, despite the decline in turnover.

Number of employees

From our analysis (Table 1), the number of employees decreased during the pandemic. Hence, the median number of employees was two in 2019, decreased to one in 2020 and remained one in 2021. Therefore, the reduction presents how the pandemic affected the employment structure and the human resources cost cutting for the dental practices in a complicated crisis.

Revenues and expenses

Practice revenues followed a similar pattern to turnover, recording a significant decrease in 2020 and a strong recovery in 2021. This variation is directly correlated with the economic activity of practices and the adaptation measures implemented following the pandemic. Expenses decreased in 2020 compared to 2019, demonstrating efforts to reduce costs in the context of lower revenues, but also the decrease in dental activity. In 2021, with the return to normal activity, expenses increased, indicating the resumption of investments and normal practice activity.

T/E (turnover/expenses) – new financial parameter

The T/E indicator registered a significant increase in 2021 compared to previous years. This growth shows that in 2021, the dental practices managed to have a higher turnover *per employee* than in the preceding years. These practices maintained the reduced number of employees observed in 2020 during the pandemic but increased their dental activity and implemented new management strategies, thereby raising their turnover *per employee*.

The analyzed period highlighted the capacity of dental practices to adapt to adverse economic conditions. The reduction in the number of employees and the optimization of expenses were essential strategies implemented to maintain profitability during the pandemic. After the pandemic, the adoption of efficient management strategies based on the lessons learned from the

pandemic contributed to the increase in profit observed in 2021.

The Covid-19 pandemic had a significant impact on the financial performance of dental practices with a T/E ratio of $< 100,000$ RON per employee in 2019. The decrease in turnover, revenues and number of employees in 2020 reflected the difficulties encountered due to restrictions and reduced dental activity. However, 2021 demonstrated a spectacular recovery in both turnover and profitability, indicating efficient adaptation and resilience of the dental practices in the face of economic changes.

In conclusion, the detailed three-year analysis of the financial performance of dental practices with a T/E ratio of $< 100,000$ RON per employee in 2019 highlights the profound impact of the Covid-19 pandemic on these practices, as well as their ability to adapt and recover. The reduction in the number of employees and expenses in 2020 was a necessary measure for financial survival, and the increase in turnover and profit in 2021 demonstrates the effectiveness of the implemented strategies. The T/E indicator increased in 2021, reflecting a more efficient use of resources and an improvement in post-pandemic financial performance. These results suggest that, despite the challenges encountered, dental practices have managed to consolidate their financial position and adapt to the new economic conditions, thereby preparing for future challenges and identifying strategies for long-term sustainability.

Analysis of dental practices with $\geq 100,000$ RON/employee in 2019

In this section, the financial performance of dental practices with a T/E ratio of $\geq 100,000$ RON per employee in 2019 will be analyzed. The analysis will assess the financial characteristics of these practices in order to identify economic vulnerabilities and their impact during the pre-pandemic, pandemic and post-pandemic periods.

The data in Table 2 show the comparison of financial parameters between the years 2019, 2020 and 2021 for dental practices with a T/E ratio of $\geq 100,000$ RON per employee in 2019. The results indicate that the financial indicators were statistically significantly different be-

tween the years according to Friedman tests ($p < 0.05$), and the post-hoc tests reveal details that will be presented in the following section.

The analysis of the financial performance of dental practices with a T/E ratio of $\geq 100,000$ RON per employee in 2019, over the pre-pandemic, pandemic and post-pandemic periods, reveals strategic adaptations in response to the economic challenges posed by the Covid-19 pandemic.

Evolution of turnover

The turnover of the analyzed practices experienced significant fluctuations over the studied period. In 2020, turnover decreased considerably compared to 2019. This decline in 2020 was directly attributed to the economic impact of the pandemic, which reduced the activity of dental practices due to restrictions and isolation measures. However, 2021 showed a significant rebound, indicating a substantial economic recovery in the post-pandemic context, as reflected by turnover levels surpassing those of 2019 and 2020.

Evolution of profit

The profit of the practices followed a trend similar to turnover, with a moderate decline in 2020 compared to 2019 and a notable increase in 2021. This moderate decrease in 2020, followed by a substantial increase in 2021, indicates a strategic adaptation by the dental practices, which managed to efficiently handle financial resources during a period of reduced activity and then achieve an economic recovery post-pandemic to improve their profit.

Revenues, expenses and T/E

The revenues of the practices followed a pattern similar to turnover, recording a significant decline in 2020 and a strong recovery in 2021. The economic activity of dental practices and all the restrictive measures that were made in the pandemic, determined this variation in dental practices economic status.

The expenses were lower in 2020 compared to 2019. In a context where revenues were lower, dentists made all the efforts for reducing

TABLE 2. Comparison of financial parameters between 2019-2020-2021 in companies with $\geq 100,000$ RON/employee in 2019

Turnover/year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	1142493 ± 3240305.3	436503 (222437.2-1013658.5)	1.89	<0.001*
2020 (p<0.001**)	1115064.4 ± 3215939	419017 (217778-1052190.2)	1.51	
2021 (p<0.001**)	1538274.3 ± 4563399.7	551790 (275932.2-1431421.5)	2.60	
Post-hoc comparison				
Dif-2019-2020	27428.65 ± 546158.12	26383 (-53979.5 – 105933.75)	-	<0.001***
Dif-2020-2021	-423209.8 ± 1429893.5	-124431 (-370628.7 – -39973.2)	-	<0.001***
Dif-2019-2021	-395781.2 ± 1647557.8	-88035 (-321918.2 – 14540)	-	<0.001***
Profit/year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	239139 ± 408220.9	109407 (46002.5-297953.2)	1.93	<0.001*
2020 (p<0.001**)	227573.3 ± 408908.4	108525 (28551.2-263058)	1.74	
2021 (p<0.001**)	330641.6 ± 611294.3	165991 (44256-405825)	2.32	
Post-hoc comparison				
Dif-2019-2020	11565.6 ± 263381.7	7331.5 (-49848.7 – 64308.2)	-	0.004***
Dif-2020-2021	-103068.2 ± 309587.3	-43170.5 (-132143.5 – 8430)	-	<0.001***
Dif-2019-2021	-91502.5 ± 399933	-36986.5 (-143089.5 – 41665.2)	-	<0.001***
Number of employees per year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	4.447 ± 10.212	2 (1-4)	2.06	0.002*
2020 (p<0.001**)	4.316 ± 10.5	2 (1-4)	1.93	
2021 (p<0.001**)	4.497 ± 10.644	2 (1-5)	2.01	
Post-hoc comparison				
Dif-2019-2020	0.131 ± 2.192	0 (0-0)	-	0.064***
Dif-2020-2021	-0.181 ± 1.796	0 (0-0)	-	0.530***
Dif-2019-2021	-0.05 ± 2.662	0 (0-0)	-	1.000***
Debts/year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	349885 ± 1619000.2	76299 (18399.25-267397.5)	2.08	0.045*
2020 (p<0.001**)	373062.7 ± 1764445.4	78788.5 (17234-284950.75)	1.96	
2021 (p<0.001**)	446097.4 ± 2228157.5	86701 (20240.5-300337)	1.96	
Post-hoc comparison				
Dif-2019-2020	-23177.74 ± 247826.2	1626 (-15591.5 – 25986.2)	-	0.104***
Dif-2020-2021	-73034.7 ± 853161.2	647.5 (-37961.25 – 28122.25)	-	1.000***
Dif-2019-2021	-96212.4 ± 889963.1	435.5 (-55589 – 34301.75)	-	0.083***
Revenue/year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	1155465.8 ± 3298909	439967 (224300.7-1023036.2)	1.86	<0.001*
2020 (p<0.001**)	1142560.8 ± 3329630.2	433037.5 (220677.5-1069825.2)	1.54	
2021 (p<0.001**)	1570516.2 ± 4659289.2	579201.5 (282971-1470877.7)	2.60	
Post-hoc comparison				
Dif-2019-2020	12904.97 ± 560374.3	21156 (-61715.5 – 100710.2)	-	<0.001***
Dif-2020-2021	-427955.4 ± 1416042.7	-122383.5 (-374759.5 – -35225.2)	-	<0.001***
Dif-2019-2021	-415050.4 ± 1683139.8	-98009 (-363110.7 – 9732.25)	-	<0.001***
Expenses/year (N=580)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	901021.1 ± 2983584.2	269383.5 (130954.5-788235)	1.88	<0.001*
2020 (p<0.001**)	902411.9 ± 3107749.5	275469 (119890.5-733062.7)	1.61	
2021 (p<0.001**)	1220960.9 ± 4248114.8	364264.5 (144846.2-1025406.2)	2.52	
Post-hoc comparison				
Dif-2019-2020	-1390.78 ± 552147.3	7354 (-36810 – 56117.75)	-	<0.001***
Dif-2020-2021	-318548.9 ± 1208797.9	-71669.5 (-245958.7 – -10683.7)	-	<0.001***
Dif-2019-2021	-319939.7 ± 1532780	-51904.5 (-223868.5 – 7222.75)	-	<0.001***
T/E /year (N=554)	Average ± SD	Median (IQR)	Mean rank	p
2019 (p<0.001**)	245375.6 ± 167430.8	195689.2 (138052.3-296586)	1.86	<0.001*
2020 (p<0.001**)	245903.1 ± 180497.1	201687.8 (129157.2-301550.4)	1.62	
2021 (p<0.001**)	323923.9 ± 241889.7	261911.7 (167096.6-402479.7)	2.52	
Post-hoc comparison				
Dif-2019-2020	-527.53 ± 106843.21	6876.43 (-36429.3 – 47192.66)	-	<0.001***
Dif-2020-2021	-78020.8 ± 130029.4	-52371.1 (-113249.7 – -13620.52)	-	<0.001***
Dif-2019-2021	-78548.3 ± 167466.68	-42118.5 (-130694.7 – 12499.91)	-	<0.001***

*related-samples Friedman's two-way analysis of variance by ranks test; **Shapiro-Wilk test;

***post-hoc Dunn-Bonferroni test.

their costs. In 2021, with the return to normal activity, expenses increased, indicating the resumption of investments and standard operational activity within the practices.

The T/E ratio in 2020 decreased significantly compared to 2019, indicating a reduction in economic efficiency in the context of reduced activity. In 2021, the T/E ratio increased considerably. These results highlight a more efficient use of human resources and also an improvement in post-pandemic economic performance. It is shown that dental practices have grown their ability to manage costs and revenues in an economic environment emerging from crisis.

The results showed that dental practices with a T/E ratio of $\geq 100,000$ RON per employee in 2019 had a higher capacity for adaptation in a new environment. The new strategies that dental practices opted for determined an increase in turnover and profit in 2021. The significant rise in the T/E indicator reflects a more effective use of human resources and an improvement in post-pandemic financial performance. The reduction in expenses in 2020 was an essential measure for financial survival in the context of diminished activity. Various management strategies, including cost management, reorganization of work schedules and streamlining human resources to increase revenue per unit of time, enabled the practices to sustain their operations

during the crisis and later capitalize on opportunities for economic recovery in 2021.

In conclusion, the detailed analysis of the financial performance of dental practices with a T/E ratio of $\geq 100,000$ RON per employee in 2019 highlights both the profound impact of the Covid-19 pandemic on these practices and their capacity to adapt and recover. $\square$

CONCLUSIONS

Figure 1 illustrates the conclusion of the sections above, presenting the evolution over the three years (2019, 2020, 2021) of the two categories of analyzed practices: those with a T/E ratio of $< 100,000$ RON per employee in 2019 and those with a T/E ratio of $\geq 100,000$ RON per employee in 2019.

The T/E parameter, which measures the ratio between turnover and the number of employees, is designed to demonstrate the financial performance of dental practices. A higher value of this ratio indicates that, on average, each employee contributes to a higher turnover, suggesting a better utilization of human resources and, consequently, greater economic efficiency.

Figure 1 presents the evolution over the three analyzed years – 2019 (pre-pandemic), 2020 (pandemic) and 2021 (post-pandemic) – of the following financial parameters: turnover, profit, T/E, revenues and expenses. The light blue color

FIGURE 1. Performance of dental practices based on T/E parameter (2019-2021)



indicates the difference between 2019 and 2020, while the dark blue color indicates the difference between 2020 and 2021, for each of the two categories of dental practices. The data used for Figure 1 were extracted from Tables 1 and 2.

Following the analysis of Figure 1, it is clearly observed that, for both practices with a T/E ratio of < 100,000 RON per employee in 2019 and those with a T/E ratio of $\geq$ 100,000 RON per employee in 2019, all described indicators increased in 2021. This positive evolution is due to the management strategies implemented based on the lessons learned during the pandemic.

What is particularly interesting is the specific evolution of practices with a T/E ratio of $\geq$ 100,000 RON per employee in 2019. Figure 1 shows that all indicators increased dramatically in 2021, far surpassing the previous years as well as the other category of dental practices. These practices, which already had a better T/E ratio before the pandemic compared to the others, also possessed the financial resources, education

and information necessary to more easily overcome this period of crisis.

Thus, by correlating the results obtained, it can be stated that practices with a T/E ratio of $\geq$ 100,000 RON per employee in 2019 prove to be more efficient in terms of financial performance. According to the data from Tables 1 and 2 and Figure 1, this category of dental practices generates a higher turnover per employee compared to practices with a T/E ratio of < 100,000 RON per employee in 2019, indicating greater productivity and efficient adaptation to the new conditions.

In conclusion, according to the T/E indicator, dental practices with a T/E ratio of $\geq$ 100,000 RON per employee are considered to be more efficient than those with a T/E ratio of < 100,000 RON per employee. $\square$

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REFERENCES

1. Tariq K, Iqbal K, Bhutta H, et al. Perceived Economic Impact of COVID-19 on Dental Practitioners: A Bi-Country Survey. *Eur J Gen Dent* 2022;11:114-122, doi: 10.1055/s-0042-1747924.
2. Rădoi D, Pantea M, Imre M, et al. Economic impact of covid-19 on Romania's capital dental practices" *Romanian Journal of Oral Rehabilitation* 2024;16:164-173, doi: 10.6261/RJOR.2024.4.16.16.
3. Rădoi D, Pantea M, Imre M, et al. Aspects regarding the impact of the Covid-19 Pandemic on private dental practices in Bucharest, Romania. *Romanian Journal of Oral Rehabilitation* 2023;15:312-322. WOS:001128394100052.
4. Liu DZ, Gallo GN, Babikow E, et al. Effects of the COVID-19 pandemic on dentists' workforce confidence and workflow. *J Am Dent Assoc* 2022;153:610-624.e8, doi: 10.1016/j.adaj.2021.11.011.
5. Farrokhi F, Farrokhi F, Mohebbi SZ, Khami MR. A scoping review of the impact of COVID-19 on dentistry: financial aspects. *BMC Oral Health* 2024;24:945, doi: 10.1186/s12903-024-04726-4.
6. Lo Nigro G, Bizzoca ME, Lo Muzio L, Campisi G. The Management of Dental Practices in the Post-COVID 19 Era: An Economic and Operational Perspective. *Int J Environ Res Public Health* 2020;17:8905, https://doi.org/10.3390/ijerph17238905.
7. Wolf TG, Barth A, Hüttmann J, et al. Economic Impact of COVID-19 Pandemic on Dental Practices in Germany: A Cross-Sectional Survey. *Int J Environ Res Public Health* 2022;19:6593, https://doi.org/10.3390/ijerph19116593.
8. Dayal G, Verma P. Factors instigating employee turnover intention amid COVID-19. *Int J Health Sci* 2022;6:5617-5637, https://doi.org/10.53730/ijhs.v6nS7.13288.
9. Karaaslan F, Dikilitaş A, Yiğit U. Effects of COVID-19 Pandemic on Turkish Private Practice Dentists' Economic Well-Being. *Balkan Journal of Dental Medicine* 2021;25:178-182.
10. Villarim NLS, Muniz IAF, Perez DEDC, et al. Evaluation of the economic impact of COVID-19 on Brazilian private dental clinics: A cross-sectional study. *Work* 2022;71:79-86, doi: 10.3233/WOR-210989.
11. Guo H, Zhou Y, Liu X, Tan J. The impact of the COVID-19 epidemic on the utilization of emergency dental services. *J Dent Sci* 2020;15:564-567, doi: 10.1016/j.jds.2020.02.002.
12. Benizian H, Beltrán-Aguilar E, Mathur MR, Niederman R. Pandemic Considerations on Essential Oral Health Care. *J Dent Res* 2021;100:221-225, doi: 10.1177/0022034520979830.
13. Amato A, Caggiano M, Amato M, et al. Infection Control in Dental Practice During the COVID-19 Pandemic. *Int J Environ Res Public Health* 2020;17:4769, https://doi.org/10.3390/ijerph17134769.
14. Kinariwala N, Samaranayake LP, Perera I, Patel Z. Concerns and fears of Indian dentists on professional practice during the coronavirus disease 2019 (COVID-19) pandemic. *Oral Dis* 2021;27 Suppl 3(Suppl 3):730-732, doi: 10.1111/odi.13459.