
Factors Influencing Customer Retention and Loyalty in Dental Practice in the United States

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Abstract

This mixed study is an analysis of factors that influence customer retention and loyalty in dental practices in the US. The study determines and encourages patient choice to visit specific dental offices, ensures the well-being of dental customers, and supports the viability of dental practices in the industry. A mixed research methodology was employed, which started with a thematic content analysis of the sampled literature. This produced 18 influencing factors for the dental industry. Afterward, these factors were constructed into survey questions to conduct the primary research via SurveyMonkey and identify dental patient perceptions regarding these 18 factors. Finally, a non-parametric Kruskal-Wallis test was employed to rank and group the 18 factors based on their importance as perceived by US dental patients. The study highlighted the similarities and differences in the influencing factors across extant literature and contemporarily collected data in the US. While the extant literature ranked communication and relation as essential factors in retaining dental patients, the survey prioritized skill and trust as the crucial factors a patient would consider when choosing a dental clinic. This study grouped and ranked all 18 of the identified factors, which any dental clinic could consider retaining and enhancing the loyalty of their existing and prospective clients.

Keywords: Dental practice, customer loyalty, customer retention, Kruskal-Wallis, literature review

Introduction

Background

This study is an assessment of the dental practice business, focusing on factors that promote customer retention and loyalty towards the dental clinic. Identifying the factors that motivate patients to come to dental clinics would be a win-win scenario for both the clinic and the dental patients. Even though owning a private dental practice requires proficient clinical experience and management capabilities as Rehan (2020) claims, there is often no formal education or training in business management at dental schools (Nazir et al., 2018).

The pervasiveness of the internet has made unverified dental practice accessible, in these kinds of practice, patients try alternative treatments to avoid dental visits and attempting

treatment on their own, such as whitening tools, retainers, and alignment appliances (Edelstein, 2020). Often, when the case is severe, this can have detrimental impacts on a patient's health. The patients' lack of awareness of evidence-based treatments could be problematic for US oral healthcare. Moreover, in the US, about 124 billion US\$ are spent on dental care every year according to Centers for Disease Control and Prevention (2023), and Sikka and Savin (2014) state that the sudden loss of patients may place a financial burden on the clinics, so the dental spending needs to be assessed if it has an impact on the retention. On top of that, Abdelrahman et al. (2021) claim the frequency of dental visits has changed after the Coronavirus (COVID-19) pandemic emerged, and it could be speculated that customer psychology and behavior toward

dental visits in the US might have changed compared to the past.

Based on the backgrounds, this study comprised three research questions (RQs):

RQ1: What factors influence customer retention and loyalty in dental practice?

RQ2: Are all factors mentioned in the answer to Research Question 1 equally crucial for clients of dental service providers?

RQ3: If the answer to Research Question 2 is no, what is the ranking of the significance of the factors that influence customer retention and loyalty for clients of dental service providers?

Since RQ1 is qualitative, the study framed the research hypothesis only for RQ2 and RQ3.

Hypothesis for RQ2:

H_0 : All factors mentioned in answer to Question 1 are equally important in influencing patient loyalty and retention of dental services.

H_a : There is a disparity among the influences of the factors mentioned in answer to Question 1 about dental service patient loyalty and retention.

Hypothesis for RQ3:

H_0 : There exists no significant difference between the factors taken into consideration.

H_1 : There exists significant difference between the factors taken into consideration.

Methods and Materials

The study employed a mixed approach, which eliminates research limitations of employing only particular types of tools for data gathering connected to a single research design or combining many studies to achieve an overall goal (Teddlie & Tashakkori, 2009).

Research Design and Method

Aligning to the objectives of RQ1, articles were selected and sorted based on the tag words on which the systematic literature review was conducted, to carry out a thematic content analysis. The analysis enabled the organization and analysis of the literature review, which is difficult to integrate due to the different nature of each article (Williams & Moser, 2019). For RQ2, a survey questionnaire was crafted based on the 18 influencing factors identified in RQ1 and on the researcher's professional expertise as a dentist. The Dental Study Questionnaire (DSQ) designed by Balkaran et al. (2014) and McAlexander et al. (1994) was incorporated into the survey design

phase in this study. SurveyMonkey was used to collect responses.

The responses were collected by using an online portal – 'Survey Monkey'. And to make sure the sample represents the attributes of the population, multiple constraints/conditions were kept before collecting the sample, for example, i) the respondent had to have visited the dental clinic at least one time within the last five year, ii) the respondents have to be within the USA, iii) the proportion of gender selected has to be equal. In the process of data collection, the total sample selected for the study was 346, after cleaning the data, 289 were fed in the SPSS for inferential analysis. In the fact Kruskal Wallis test could be conducted when the sample size is small, a sample size of more than 5 is enough for conducting Kruskal-Wallis test (Mugabe et al., 2022).

Following the data collection, a batch Kruskal-Wallis test was employed. This is a non-parametric test used when quantitative research is carried out with ordinal or rank-based data (Gordon, 2022). This test examined if there were any differences among the factors influencing why clients chose certain dental clinics. Ultimately, the presence of differences in RQ2 prompted the researcher to create RQ3 and carry out a more rigorous stepwise Kruskal-Wallis test with an objective of ranking the influencing factors based on responses in the US.

Instrumentation

The thematic content analysis was carried out for the analysis of sampled literature in RQ1 using MS-Excel. The survey questionnaire was designed, and the data was collected through SurveyMonkey for RQ2. A five-point Likert Scale, where a scale of one (1) identifies *strongly disagree* to five (5) *strongly agree*, was provided for the survey. A Statistical Package for the Social Sciences (SPSS) was used to carry out a batch and stepwise Kruskal-Wallis test for RQ2 and RQ3, respectively.

Results

RQ1: Influencing Factors in Dental Practice

Table 1 summarizes the most frequently referenced themes in the sampled papers, along with the names of their authors. There were 32 journal articles from 19 countries, and communication was the most referenced factor,

followed by relation, service quality (SQ), trust, facility, perceived value, time management effectiveness (TimeMgt), empathy, equipment, word of mouth (WOM), professional manner (ProfMn), skillfulness, treatment gentleness (TxGentl), flexibility of appointment (FlexAppt),

cost transparency (Transp), insurance, accessibility, and Social Networking Service (SNS).

Table 1
Influencing Factors Per the Literature Review

S. No	Factors	Number of Articles	Authors
1	Communication	18	American Dental Association, n.d.-a; American Dental Association, n.d.-d; Baldwin & Sohal, 2003; De Lira & Magalhães, 2018; Fujimura, 1995; Geangu et al., 2010; Hamanaka, 2015; Htang, 2019; Ismail & Bader, 2004; Lasadika, 2018; Lee et al., 2014; Matsuda, 2015; McAlexander et al., 1994; McGuigan & Eisner, 2006; Taylor, 2007; Turley, n.d; Ueltschy et al., 2007; Wilson, 2006.
2	Relation	16	Baldwin & Sohal, 2003; De Lira & Magalhães, 2018; Geangu et al., 2010; Gremler & Brown, 1996; Htang, 2019; Lasadika, 2018; Lee et al., 2014; Matsuda, 2015; McAlexander et al., 1994; McGuigan & Eisner, 2006; Royals, 2020; Turley, n.d; Ueltschy et al., 2007; Vargas Perez et al., 2015; Vargas et al., 2012; Wilson, 2006.
3	SQ	12	Baldwin & Sohal, 2003; Geangu et al., 2010; Hashem & Ali, 2019; Htang, 2019; Ismail & Bader, 2004; Köseoğlu & Mutlu, 2019; Lasadika, 2018; Matsuda, 2015; McAlexander et al., 1994; Ueltschy et al., 2007; Vargas Perez et al., 2015; Vargas et al., 2012.
3	Trust	12	Alhidari & Alkadhi, 2018; Fujimura, 1995; Gremler & Brown, 1996; Hamanaka, 2015; Htang, 2019; Ismail & Bader, 2004; Köseoğlu & Mutlu, 2019; Lasadika, 2018; Matsuda, 2015; Turley, n.d; Ueltschy et al., 2007; Vargas et al., 2012.
5	Facility	11	Baldwin & Sohal, 2003; Balkaran et al., 2014; Fujimura, 1995; Hamanaka, 2015; Htang, 2019; Ismail & Bader, 2004; Lasadika, 2018; Matsuda, 2015; Siripipatthanakul & Nyen Vui, 2021; Ueltschy et al., 2007; Wanyonyi et al., 2017.
6	Perceived Value	10	Alhidari & Alkadhi, 2018; Baldwin & Sohal, 2003; De Lira & Magalhães, 2018; Hamanaka, 2015; Htang, 2019; Lasadika, 2018; Linh et al., 2020; Matsuda, 2015; Siripipatthanakul & Nyen Vui, 2021; Taylor, 2007.

6	TimeMgt	10	Baldwin & Sohal, 2003; De Lira & Magalhães, 2018; Fujimura, 1995; Htang, 2019; Lasadika, 2018; Lee et al., 2014; McGuigan & Eisner, 2006; Okuji, 2016; Siripipatthanakul & Nyen Vui, 2021; Turley, n.d.
8	Empathy	9	Baldwin & Sohal, 2003; Hamanaka, 2015; Hashem & Ali, 2019; Ismail & Bader, 2004; Lasadika, 2018; Matsuda, 2015; Ueltschy et al., 2007; Vargas Perez et al., 2015; Vargas et al., 2012.
8	Equipment	9	Baldwin & Sohal, 2003; Fujimura, 1995; Hamanaka, 2015; Htang, 2019; Ismail & Bader, 2004; Lasadika, 2018; Matsuda, 2015. Siripipatthanakul & Nyen Vui, 2021; Ueltschy et al., 2007.
8	WOM	9	Fujimura, 1995; Hamanaka, 2015; Hashem & Ali, 2019; Htang, 2019. Ismail & Bader, 2004; Köseoğlu & Mutlu, 2019; Lasadika, 2018. Matsuda, 2015; McGuigan & Eisner, 2006.
11	ProfMn	7	American Dental Association, n.d.-a; Baldwin & Sohal, 2003; Hamanaka, 2015; Htang, 2019; Matsuda, 2015; Siripipatthanakul & Nyen Vui, 2021; Vargas Perez et al., 2015.
11	Skillfulness	7	Baldwin & Sohal, 2003; Fujimura, 1995; Hamanaka, 2015; Htang, 2019; Matsuda, 2015; Siripipatthanakul & Nyen Vui, 2021; Vargas Perez et al., 2015.
11	TxGentl	7	Baldwin & Sohal, 2003; Fujimura, 1995; Hamanaka, 2015; Htang, 2019; Matsuda, 2015; Siripipatthanakul & Nyen Vui, 2021; Vargas Perez et al., 2015.
14	FlexAppt	6	Baldwin & Sohal, 2003; Htang, 2019; Okuji, 2016; Sharifian & Dean, 2016; Siripipatthanakul & Nyen Vui, 2021; Ueltschy et al., 2007.
15	Transp	5	Alhidari & Alkadhi, 2018; Burger, 2018; Geangu et al., 2010; Okuji, 2016; Turley, n.d.
15	Insurance	5	Burger, 2018; McGuigan & Eisner, 2006; Okuji, 2016; Sharifian & Dean, 2016; Turley, n.d.
17	Accessibility	4	Baldwin & Sohal, 2003; Htang, 2019; Okuji, 2016; Sharifian & Dean, 2016.
18	SNS	3	Alhidari & Alkadhi, 2018; American Dental Association, n.d.-a; De Lira & Magalhães, 2018.

Once the sampled articles were assessed, the researcher generated 18 open codes/themes as the influencing factors. *Table 2* summarizes employed open, axial, and selective code based on thematic content analysis. After generating the influencing factors, the axial code was developed

to categorize themes by sorting the shared characters and features of the factors. The 18 themes were then sorted into six groups as nodes in axial code. Finally, selective code was determined and ranked based on the total counts in *Table 2*.

Table 2
Outcome of the Thematic Content Analysis

Nodes	Themes	Individual Reference	Total
Relationship	Relation	16	55
	Communication	18	
	Trust	12	
	Empathy	9	
Internal factors	Facilities	11	42
	Equipment	9	
	Accessibility	4	
	FlexAppt	6	
	SQ	12	
Professionalism	Skillfulness	7	31
	ProfMn	7	
	TxGentl	7	
	TimeMgt	10	
Referral	WOM	9	12
	SNS	3	
Customer's value	Perceived value	10	10
Costs	Transp	5	10
	Insurance	5	

Note. Axial code is derived from the open code.

As illustrated in *Table 2*, the relationship factor had a score of 55, the highest in total sum, based on the cumulative sum in selective code. This indicated that this factor was the most important element among the six groups. However, the scores of internal factors and professionalism, 42 and 31, respectively, were also high. The other three lower factors, referral,

customer value, and costs had much lower scores.

RQ2: Are all Factors Equally Important?

Table 3 shows a descriptive analysis of the sample collected through SurveyMonkey. The 18 factors were ordered by the total number of Likert Scale points.

Table 3
Descriptive Analysis

	Mean	Median	Mode	Standard Deviation	Sum
Skillfulness	4.70	5	5	0.59	1358
Trust	4.70	5	5	0.63	1357
Communication	4.47	5	5	0.69	1291
Transp	4.46	5	5	0.71	1289
ProfMn	4.46	5	5	0.67	1289
SQ	4.45	5	5	0.64	1285
Accessibility	4.43	5	5	0.67	1280
TxGentl	4.40	5	5	0.69	1272
Perceived Value	4.39	4	5	0.68	1270
Equipment	4.39	5	5	0.72	1268
Empathy	4.30	4	5	0.78	1244
TimeMgt	4.29	4	4	0.74	1239
FlexAppt	4.25	4	4	0.78	1228
Facility	4.22	4	4	0.71	1220
Insurance	4.14	4	5	0.90	1196
Relation	4.13	4	5	0.95	1195
WOM	3.40	4	4	1.09	984
SNS	2.66	3	3	1.25	768

Table 4 depicts the outcome of the Kruskal-Wallis test. Since the p -value is zero, the null hypothesis (H_0) was rejected, inferring that all the

18 factors included in the test were not equally important in influencing customer retention and loyalty to the dental practice.

Table 4
Outcome of the Kruskal-Wallis Test

H_0	Sig.	Decision
All factors are equally important.	.000	Reject H_0 .

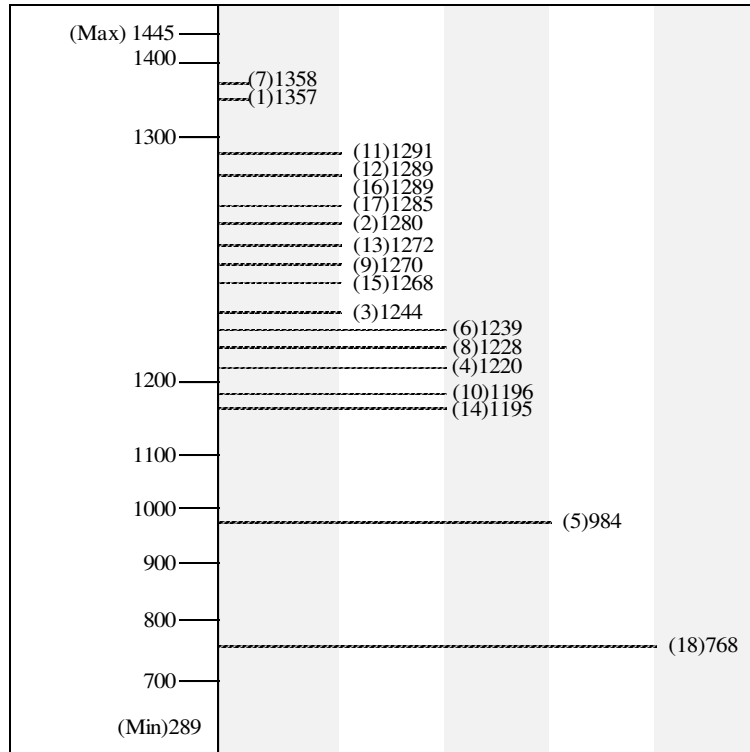
RQ3: Ranking the Influencing Factors

Since the equal importance of sampled influencing factors was rejected in RQ2, further assessment was carried out in RQ3, which focused on the individual prioritization of the elements considered in RQ2.

Analysis of Likert Scale Point

The 18 factors were ranked based on the total sum of the Likert Scale point in *Figure 1*, which was later tested using the Kruskal-Wallis test, and the total sum was derived from the descriptive analysis (Table 3).

Figure 1
Total Likert Point of Each Factor



As shown in *Figure 1*, each factor's total sum of Likert Scale points was recorded into a scale, and the influencing factors were numbered in the scale based on a random order by the researcher for the survey questionnaire provided for RQ2.

Kruskal-Wallis Test Following the Likert Scale Analysis

Following the order on *Figure 1*, a Kruskal-Wallis test was employed again to analyze the numeric significance among the factors. Then the

influencing factors were categorized based on their significance values.

Rank 1 and Group 1

First, trust and skillfulness, the highest and second highest factors in the Likert Scale points, were compared via significance value through a Kruskal-Wallis test. The results showed no difference between the two factors since the significance value was 0.914, so H_0 was retained (Table 5).

Table 5
Outcome to Determine Rank 1 and Group 1

H_0	Sig.	Decision
Compared factors are equally important.	.914	Retain H_0 .

Following the first comparison, the third influencing factor, communication (11), was added to the two preexisting factors (1 and 7),

and a Kruskal-Wallis test was conducted for these three factors. The computation revealed that the significance value was less than 0.001,

so there was a statistical difference between them, and H_0 was rejected (Table 6). Therefore, the outcome indicated that trust and skillfulness

had the same level of importance, but the third factor (communication) differed from the other two factors (i.e., 1 and 7).

Table 6
Outcome to Distinguish Rank 1 and Group 1

H_0	Sig.	Decision
Compared factors are equally important.	<.001	Reject H_0 .

Since communication (11) was confirmed to be significantly different from skillfulness (7) and

trust (1), rank 1 as group 1 was generated (Table 7).

Table 7
Summary of Rank 1 and Group 1

S. No	Factor	P-Value	P-Value	Remark	Remark
1	Trust	0.914	0.001	F1=F7	(F1=F7) not equal to F11
7	Skillfulness				
11	Communication				

Rank 2 and Group 2

A new Kruskal-Wallis test was performed where communication was introduced as the opening factor for the second group (since it was observed to be different by the respondents, it was kept in the new group). The researcher

continued to compare the third factor (i.e., communication) with the remaining factors (12, 16, 17, 2, 13, 9, 15, and 3), one by one in descending order (Figure 1) and continued adding one more factor to the same group until a difference in significance was observed.

Table 8
Outcome to Determine Rank 2 and Group 2

H_0	Sig.	Decision
Compared factors are equally important.	0.226	Retain H_0 .

The test revealed that the significance value for the factors (11), (12), (16), (17), (2), (13), (9), (15), and (3) had the p -value of 0.226. Hence, we retained H_0 since no difference in the importance of the factors was perceived by the dental patients (Table 8).

Next, when the twelfth factor, TimeMgt (6), was added to the existing factors (11, 12, 16, 17, 2, 13, 9, 15, and 3), the p -value was 0.018, so H_0 was rejected at that point (Table 9). Therefore, since TimeMgt (6) had a different significance, it was introduced again as an opening factor for Group 3 and Rank 3.

Table 9
Outcome to Distinguish Rank 2 and Group 2

H_0	Sig.	Decision
Compared factors are equally important.	.018	Reject H_0 .

Since TimeMgt was confirmed to be significantly different from the elements (11, 12, 16, 17, 2, 13, 9, 15, and 3), rank 2 and group 2

was generated, and Table 10 is a summary of the computation process until the significance was met.

Table 10
Summary of Rank 2 and Group 2

S.	No	Factor	PV	PV	PV	PV	PV	PV	PV	PV	PV	Rmk	Rmk
	11	Comm	0.988	0.95	0.881	0.869	0.731	0.616	0.621	0.226	0.018		
	12	Transp											
	16	ProfMn										F11	(F11
	17	SQ										=F12	=F12
	2	Access										=F16	=F16
		Tx										=F17	=F17=
	13	Gentl										=F2	F2
		Pcvd										=F13	=F13
	9	Value										=F9	=F9
	15	Equip										=F15	=F15
	3	Emp										=F3	=F3)
	6	TME											is not
													equal
													to F6

Rank 3 and Group 3

Again, TimeMgt (6) was kept as an influencing factor for Rank 3 and Group 3. The remaining elements, (8), (4), (10), and (14),

continued to be added one at a time until we had a *p*-value higher than 0.05 (Table 11).

Table 11
Outcome to Determine Rank 3 and Group 3

<i>H₀</i>	Sig.	Decision
Compared factors are equally important.	.437	Retain <i>H₀</i> .

Moreover, when WOM (5) was added to the existing group of factors, (6), (8), (4), (10), (14), the *p*-value was observed to be zero (Table 12). Therefore, *H₀* was rejected, inferring that WOM met a different level of significance in comparison to (6), (8), (4), (10), and (14). Thus, WOM was kept as the opening factor for Rank 4 and Group

4, and (6), (8), (4), (10), and (14) were categorized into Rank 3 and Group 3. In short, the test confirmed that the seventeenth factor (i.e., WOM) had a different significance than the factors of Group 3, so the factor of WOM was taken as an opening factor for Group 4.

Table 12
Outcome to Distinguish Rank 3 and Group 3

<i>H₀</i>	Sig.	Decision
Compared factors are equally important.	.000	Reject <i>H₀</i> .

Since WOM was confirmed to be significantly different from the elements (6, 8, 4, 10, and 14), rank 3 as group 3 was generated, and Table 13

is a summary of the computation process until the significance was met.

Table 13
Summary of Rank 3 and Group 3

S. No	Factor	P-Value	P-Value	P-Value	P-Value	P-Value	Remark	Remark
6	TimeMgt	0.629	0.473	0.651	0.437	0	F6=F8 =F4=F10 =F14	(F6=F8= F4=F10 =F14) is not equal to F5
8	FlexAppt.							
4	Facility							
10	Insurance							
14	Relation							
5	WOM							

Rank 4 and Group 4

Finally, when WOM (5) was kept as an opening factor for the fourth group and SNS (18) was added to it, the results showed that the significance between the two factors was less

than zero (0). Since H_0 was rejected (Table 14), the computation demonstrated that the two factors were not equally important for the dental customer.

Table 14
Analysis to Distinguish Rank 4 and Group 4

H_0	Sig.	Decision
Compared factors are equally important.	<.001	Reject H_0 .

Thus, from Table 14, we can see that WOM (5) and SNS (18) have different levels of importance in the eye of dental customers. WOM

was ranked 4th in Group 4; SNS was ranked 5th in Group 5.

Table 15
Rank and Group of Influencing Factors

Rank (R)Group (G)	Factors
R1G1	(7) Skillfulness (1) Trust (11) Communication (12) Cost Transparency (16) ProfMn (17) SQ
R2G2	(2) Accessibility (13) TxGentl (9) Perceived Value (15) Equipment (3) Empathy (6) TimeMgt
R3G3	(8) FlexAppt (4) Facility (10) Insurance (14) Relation
R4G4	(5) WOM
R5G5	(18) SNS

As shown in **Table 15**, the 18 influencing factors were further classified into five distinct groups with the respective ranking of each group. While the ranking was based on the total Likert point, the grouping was based on the Kruskal-Wallis test. Each of the factors in a group was perceived equally necessary by the respondents; there was no difference among the factors in groups.

Discussion / Implications

Out of the 18 influencing factors identified in RQ1 through the thematic content analysis of extant literatures, relationship which comprised of four influencing factors (relation, communication, trust and empathy) was the highest rank following dental clinic's internal factors which comprised of five influencing factors (facilities, equipment, accessibility, FlexAppt and SQ) as the second. Likewise, the batch Kruskal-Wallis test carried in RQ2 for 18 influencing factors rejected the null hypothesis resulting in an inference that not all of the influencing factors were equally important. Finally, the stepwise Kruskal-Wallis test in RQ3 categorized trust and skillfulness as ranked 1 and group 1 factors, whereas SNS and WOM were ranked as least important by the dental clients. This result reveals a cognitive gap between the understanding of the relevant research articles and customers' expectations regarding the critical factors influencing customer retention and loyalty.

As the outcome of the quantitative research, the actual expectation for skillfulness from customers is still high, and also the importance of that factor as professional competency has been discussed (American Dental Association, n.d.-c). As stated by Alrubaiee and Alkaa'ida (2011), trust from customers was another very crucial factor in the study for the success of medical healthcare business, especially for a small practice business. The SNS and WOM were less important for the respondents when choosing a dental clinic. This implies that customers do not consider these factors as important, which is a slightly different result from the relevant research articles (Alhidari & Alkadhi, 2018).

In comparison with the relevant articles, the study by Alhidari and Alkadhi (2018) had similarities in research direction and stated perceived value and trust as an important factor. Also, while McAlexander et al. (1994) focused on

dental service quality, this study has brought 18 influencing factors focusing on a systematic review of dental literature based on the tag words.

Conclusion

This mixed study highlighted the importance of the factors that dental clients would consider before selecting the dental clinics. While the systematic analysis of extant literatures stated 18 crucial factors where communication and the relation between the dental clients and clinics were on the top of the list, the inferential test carried on the same variables concluded that skills of doctors and trust were the prime factors for deciding a dental clinic. The findings from the study will help dental firms focus on the factors that clients think of prime importance while selecting the dental clinics. The perception could further be studied across the different demographic dimensions like their age, income level, education level, and gender.

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