(RESEARCH ARTICLE)

A suggested assessment scale for parental dental care satisfaction: Peri- and post-procedural composite data of children and parents

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Abstract

There is a lack of knowledge on the relationship between parental satisfaction and the quality of dental treatment that their children get. Based on the findings of the study, it has been determined that about one-third of all children under the age of ten who need dental treatment require general anaesthesia. This is due to the fact that their parents are dissatisfied with the conventional approaches that are being taken towards them. SatTot is a multidimensional evaluation tool that takes into consideration wait times, parental characteristics (such as education level), and child-related aspects (such as age and post-surgery recovery) as major predictors. The purpose of this research was to construct and analyse SatTot on a multidimensional scale. By taking into account all of these significant aspects, this instrument would be able to determine the amount of contentment experienced by parents. We used a historical observational method in order to study the data that was collected from 119 children, ranging in age from three to ten years old, who visited Queen Alia Military Hospital for extractions, exodontia replacements, pulp therapy, or replacements during the months of January 2023 and December 2024. A mix of controlled family follow-ups, professional notes, and electronic medical records (the Hakeem system) was used to gather the data. There was a good level of satisfaction overall, as shown by the findings (mean SatTot = 3.28 ± 1.12), and the model was able to explain 85.2% of the variance in satisfaction ($R^2 = 0.852$, $p < 0.001$). Based on the statistical analysis, it was determined that the level of education of the parents was the most significant positive predictor ($\beta = 0.43$, p lower than 0.001). Following that, the age of the kid was determined ($\beta = 0.38$, $p < 0.001$), and both social activity ($^2 = 0.29$) and eating ($^2 = 0.22$) were used to evaluate the improvements that occurred following the operation. Both of these variables had a p-value that was less than 0.001. When compared to waiting periods, which had a statistically negative impact ($\beta = -0.37$, $p < 0.001$), each 30-day delay resulted in a 0.12 point drop in happiness. Although our findings were consistent with those of other research that investigated socioeconomic difficulties (for example, Almeida et al., 2021), they were distinct from those of locations that had effective appointment systems (for example, Patel et al., 2023) in terms of the cultural and organizational disparities that existed between the two groups. The reliability of the SatTot scale in real-life settings was determined to be fairly high, as shown by the Cronbach's α coefficient, which was 0.891. Through the reduction of wait times, the facilitation of communication between parents with less dental knowledge and their children's dentists, and the standardization of the process by which children recover from surgical procedures, we were able to enhance the dental care that is provided to children. The findings of this research underline the need for having a wide variety of happiness assessments that are culturally appropriate in order to enhance family-centred treatment in paediatric dentistry.

Keywords: Parental Satisfaction; Pediatric Dentistry; Waiting Times; Post-Procedural Recovery

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1. Introduction

Within the realm of holistic healthcare delivery, the degree of contentment experienced by parents of paediatric children in relation to dental treatment is an essential component that is sometimes overlooked. Because it influences treatment adherence, compliance with follow-up visits, and overall judgements of the quality of dental care, parental satisfaction is an essential factor to consider. When it comes to children under the age of ten who need dental treatment, approximately one-third of them end up being placed under general anaesthesia [1]. This is due to the fact that parents are dissatisfied with the outcomes of standard dental care. It is essential to evaluate and enhance the level of satisfaction experienced by parents in order to make the most of the opportunities presented by dental care for children, as shown by this figure.

There are a lot of factors that contribute to the multi-dimensional notion of healthcare satisfaction [2]. These factors include clinical findings, communication, waiting times, and recuperation after the treatment. Due to the limited patient cooperation that occurs in paediatric dentistry, the role that parents attitudes play in shaping the long-term dental care-seeking habits of their children is even more important [3]. Consequently, it is of the utmost importance to enhance the delivery of treatment, establish trust, and guarantee that dental treatments are considered effective and patient-centred by determining the elements that contribute to the pleasure of individuals who are parents. There is a lack of standardization or thorough coverage of relevant factors in many of the assessment measures that are used to assess parental satisfaction, as shown by the research that has been done and is now available [4]. When it comes to dental care for children, a more nuanced approach is necessary, one that takes into consideration both the perspectives of the parents and the outcomes that are special to the kid. This is in contrast to the several validated instruments that are used to evaluate patient satisfaction in adult populations [5].

Despite the fact that some studies have investigated the level of contentment experienced by parents after their children have had dental treatment while under sedation or general anaesthesia, other studies have failed to take into consideration the whole of the experience, instead concentrating on the degree to which the surgery was successful [6]. An all-encompassing assessment instrument should contain several variables, such as expectations before the operation, interactions during the process, and recuperation after the treatment [7]. This will allow for the provision of a robust framework for assessing happiness. Due to the fact that there is not yet a standardised, multidimensional scale that is accessible in the literature, there is an obvious need for a specialist instrument that is capable of addressing the challenges that are associated with performing dental treatment on children.

A composite assessment instrument would be developed by the researchers who are responsible for the proposed study in order to fulfil this demand. This instrument would evaluate parental satisfaction in all of its aspects. The fact that there are a number of interconnected aspects that influence enjoyment will be taken into consideration by this instrument, which will take into account concerns that belong to both children and their parents. When it comes to children, it is essential to take into consideration the degree of pain they experience after the treatment, the length of time it takes for them to recover, and the ease with which they can resume their daily activities (such as eating, sleeping, and socialising with other people) [8]. These aspects have an impact on the overall levels of satisfaction, which in turn have an influence on the thoughts that parents have on the efficacy and comfort of the therapy. On the other hand, parental-specific criteria such as wait times, clarity of communication throughout the procedure, and results that are congruent with expectations are as relevant in terms of satisfaction ratings [9].

The goal of this study is to contribute to the enhancement of the delivery of dental care for children by developing a scale that is more accurate and dependable in terms of measuring parental satisfaction. This will be accomplished by merging the aforementioned elements into a single scale. The approach for this study was a retrospective observational design, and it drew on the information that was collected from paediatric dental patients who were visited at Queen Alia Military Hospital during the months of January 2023 and December 2024. We included children between the ages of three and ten years old who were undergoing typical dental procedures such as extractions, restorations with exodontia, or pulp therapy [10]. This allowed us to build a representative sample that accurately represents the situations that are involved in routine paediatric dental care. The data will be collected via clinical notes, electronic medical records (using the Hakeem system), and direct parental follow-ups in order to increase accuracy and minimise the amount of information that is lacking about the patient. We are going to systematically monitor and assess a variety of factors, such as post-procedural recovery measures and the degrees of satisfaction according to parental reports. The research did not include cases who were first treated with local anaesthesia or had incomplete data that exceeded 5% [11]. This was done to ensure that the data remained correct and relevant throughout the study. This research makes a substantial contribution to the field by using a computational method to assess customers' levels of pleasure.

As a result of the study, a composite score known as "SatTot" will be generated. This score will combine several indicators of satisfaction by categorising them as either low (0) or high (1), based on the criteria that were evaluated [12]. It is possible for us to have a more nuanced understanding of the myriad of ways in which the viewpoints of parents are formed by using this strategy. During the process of statistically validating the composite scale, we will utilise Cronbach's Alpha to check for internal consistency, and we will use inter-term correlation matrices to check for reliability [13]. The need for a significance threshold of $p < 0.05$ is necessary in order to guarantee a robust statistical interpretation, which in turn enhances the reliability of the tool that is generated [14]. The final scale will not only be helpful in clinical settings; it will also contribute to the expanding body of research on the importance of patient-centered therapy in paediatric dentistry.

Furthermore, in addition to the theoretical contributions it makes, this study has significant practical implications for dental practitioners and policymakers throughout the country. The identification of significant determinants of parental satisfaction may provide insight into the improvement of communication, the reduction of waiting times, and the optimisation of post-procedure care regimens [15]. As an additional benefit, the development of a standardised satisfaction measure makes it possible to conduct benchmarking across several institutions, which in turn makes it possible to conduct comparative analysis and CQI projects [16]. This study is in keeping with global trends towards dental treatment models that are more inclusive and responsive [17], which is appropriate given the rising significance of patient-reported outcomes in the healthcare industry. It is possible that future research that investigates long-term applications of the measure may look at the predictive validity of the scale in various cultural or therapeutic contexts [18]. In conclusion, the findings of this study emphasise the importance of parental contentment as a fundamental component, and they urge for a technique of assessing paediatric dental therapy that is both completer and more driven by data.

2. Methods and materials

This research used a methodology known as retrospective observational research [10] to determine the level of satisfaction parents had with the dental treatment their children received at Queen Alia Military Hospital. For the purpose of this research, data will be collected from children within the age range of three to ten years old, with a mean age of six years old, who had one of three common dental operations between January 2023 and December 2024 [11]. Extraction of the tooth, restoration with exodontia, or restoration with pulp therapy were the treatments used in this practice. To provide a comprehensive illustration of the typical dental care provided to children, these procedures were selected. In this way, researchers are able to provide a comprehensive picture of the degree to which parents are pleased with the dental treatment that their children receive in a range of clinical settings [12].

 The information will be obtained via Hakeem, which is the electronic medical record system used by the hospital [19]. Additionally, it will contain dental records that have been written down, as well as direct phone follow-ups with parents in order to clarify any information that is unclear or missing [21]. Cases lacking more than five per cent of patient data will be excluded from the study, as will cases involving children who were under local anaesthesia at the beginning of the research. This is done to ensure that the population under investigation remains unchanged and that the findings are not influenced by variations in the kind of anaesthetic or by a deficiency in data [11, 30]. The features that were investigated in this research may be divided into two primary categories: those that pertain to children and those that pertain to parents [7]. When assessing children, the most important factor is how uncomfortable they feel after treatment.

Depending on the child's age and level of comprehension, the assessment may be accomplished with the use of a visual analogue scale (VAS) that has been authorised or the Wong-Baker FACES Pain Rating Scale [22]. The duration of healing, which is the amount of time it took for the kid to resume regular sleeping, eating, and social activities, will also be recorded in days [8]. Such data will allow for the determination of how the treatment impacted the child's day-to-day life. The number of days that the patient must wait before the surgery, the quality and clarity of interaction with dental practitioners both before and after the treatment [9], and the primary outcome measure, the amount of happiness experienced by the family [1], are all elements that are considered to be involved in the family. In addition to qualitative comments obtained via follow-up conversations, in which parents will be asked standard questions about their overall experience, how effective they believed the process to be, and any aims that were not achieved [21], these parameters will be derived from organised fields inside the Hakeem system [19].

When quantitative and qualitative data are combined, it ensures that the elements that influence happiness are thoroughly researched, and the use of up-to-date medical records helps to limit the possibility of memory bias [27].We will first construct the composite satisfaction scale, also known as SatTot, using a binary classification algorithm. As a result, maternal satisfaction will be divided into two categories: lower (0) and higher (1), according to the limitations

that have been established for each variable [12]. For instance, parents who report that their children had little to no discomfort after the treatment, a short amount of time needed for recovery, and effective communication would get a score of one, while grandparents who report that they are dissatisfied with any of these aspects will receive a score of zero [7]. Next, computer analysis will combine the data from both sides to generate a single score. When it comes to the basics of regression modelling, this score will be weighted according to the degree of significance that each variable was discovered to have [23]. Both the reliability and the internal consistency of the SatTot scale will be evaluated by the researchers with the help of Cronbach's Alpha. When it comes to scale dependability, a value of 0.70 or more is deemed to be acceptable [24]. In addition, an inter-term correlation matrix will be constructed to evaluate the degree of consistency that exists between the variables they are associated with. Performing this action will guarantee that the components of the scale are statistically consistent and do not recur [28]. For the purpose of hypothesis testing, a significance level of $p < 0.05$ will be regarded as significant [14]. We will conduct all the tests using SPSS version 27.0 [23].

We gave significant attention to ethical considerations for this investigation. We first filed it with the Jordanian Institutional Review Board (IRB) on February 4, 2025, under reference number 24_2/2025. Last but not least, on July 14, 2025, it was granted final permission by the Directorate of Educational and Training, in addition to receiving approval from the Institutional Review Board of Queen Alia Military Hospital [25]. For the purpose of protecting the patients' privacy, all of the medical data were "de-identified" before they were evaluated [26]. We took this action because the research was retrospective in nature. We explained the research objectives to the parents contacted for follow-up, and they verbally cooperated. All private data was handled according to HIPAA and Jordanian data protection laws [26]. With retrospective designs, there are a few issues that might arise, such as inconsistencies in the documentation or variations in the manner in which clinical records are maintained [30].

 Before doing the full-scale study, we conducted a pilot audit of fifty records that were selected at random to ensure that the procedures for data extraction were consistent. The pilot audit allowed us to circumvent the issues that were being encountered [27]. Although the condition that children be treated with local anaesthetic be omitted is necessary to maintain consistency in the procedures [11], it is also recognised that this makes it more difficult to generalize the findings to all different kinds of dental treatment for children. Because of [5] The analytical rigour of this research is a consequence of the fact that it examines both clinical and experiential findings. This approach helps to fill in the gaps that exist between objective treatment measurements and the personal ideas of parents. By developing a validated, multidimensional happiness measure, the purpose of this research is to provide medical professionals with a helpful instrument that can be used to monitor and enhance the quality of treatment [16]. In addition to this, it will contribute to a greater discussion about patient-centered outcomes in paediatric dentistry [17]. Future modifications to the SatTot scale could enable real-time satisfaction monitoring through digital technologies [18]. It may also be evaluated in a variety of healthcare settings.

3. Results

Among the 119 paediatric dentistry cases that were examined, the research of mother satisfaction (SatTot) discovered that the mean score was 3.28 (±1.119). This value indicates that the overall levels of pleasure were average, but there was a significant amount of difference amongst the interviewees. The mean age of the children was 5.79 years, with a standard deviation of 1.512, and the mean wait time was 180.14 days, with a standard deviation of 116.578. This figure indicates that there were significant gaps between the time the operations were planned and the time they actually took place.

 A bimodal distribution was seen in the levels of education of the parents, with forty-four per cent of them having completed at least a secondary education (which was denoted by the code G01). The fact that eighty-seven per cent of youngsters resumed their usual food intake and social activities within the anticipated time periods after the treatment is a positive indicator for the overall therapeutic findings. The results of the bivariate analysis revealed that there was a significant relationship between SatTot and all of the anticipated parameters ($p<0.001$). The correlation between age and happiness was relatively strong ($r=0.410$), which indicates that parents of older children reported significantly higher levels of contentment with their life. Waiting days showed the strongest negative connection ($r=-0.675$), which indicates that individuals were much less pleased when they had to wait for a lengthy period of time. The findings of the method showed that there was a large positive correlation between parental education and eating normalisation ($r = 0.395$), whereas the results of social activity resumption ($r = 0.344$) and eating normalisation ($r = 0.395$) were much smaller but still statistically significant.

Notably, there were almost no inter-variable correlations (all correlation coefficients were <0.371), showing no multicollinearity issues.The regression model explained 85.2% of the variation in SatTot ($R^2=0.852$, $F(5,113)=130.177$,

p<0.001), and a corrected R^2 of 84.6% showed that it wasn't overly complicated. Every single one of the parameters had a significant impact on the comprehensive model (p<0.001). The most significant predictor was the level of education of the parents (β=0.433), followed by the number of waiting days (^{2}=-0.370) and the age of the kid (^{2}=0.379). The effects of social healing immediately after surgery (β=0.285) and eating again (β=0.224) were reduced, but they were still significant. The happiness scale equation that was discovered, which is SatTot=0.348+0.281×Age−0.004×WaitingDays+0.973×Education+0.956×SocialActivity+0.775×Feeding, has the potential to be used as a trustworthy computer tool in clinical contexts.

 Particularly noteworthy is the fact that the negative estimate for waiting days (-0.004) demonstrates that the happiness ratings decreased by 0.12 points for every additional 30 days of delay period. Conversely, higher levels of education (0.973) and social healing (0.956) led to practically identical increases. The age-related effects (0.281 each year) demonstrate that developmental characteristics have an impact on how parents feel about their kid's health, even if the youngster does not have any improvement in their condition. In addition to the fact that the 95% confidence intervals for all values other than zero demonstrate that the effects are significant, the standard error of the model, which is 0.440, demonstrates that it is quite accurate. Following the occurrence, the power analysis revealed that there was a more than 99% probability of detecting effects at a significance level of α=0.05. Additionally, residual diagnostics demonstrated that the errors were distributed in a normal manner, as shown by the Shapiro-Wilk p-value of 0.214. The Durbin-Watson statistic, which was 1.923, demonstrated that there was no autocorrelation.

Additionally, the variance inflation factors, which were all less than 1.8, provided further evidence that the model was still stable. Clearly, the pleasure of families is a multifaceted phenomenon. Administrative issues, such as wait times; social factors, such as education; and clinical results, such as healing measures, all have an impact on it. Every one of these elements contributes to the formation of broad perspectives. The investigations of the subgroups revealed intricate patterns. An example of this would be families where the parents had college degrees, who were 1.2 points happier than families where the parents had only basic education (t (117) =5.892, p<0.001). Additionally, cases that took more than 200 days to be treated were 1.8 points less satisfied than those that were treated within 60 days (F (2,116) =27.341, p<0.001). Researchers found a 0.9-point difference in happiness between 7–10-year-olds and 3–6-year-olds (p = 0.003).

This might be due to variances in the severity of the therapy or the degree to which the children were able to communicate effectively. When outliers (n=6) were removed from the model, the coefficients did not vary by more than 3%, and bootstrapped estimates (1,000 samples) revealed essentially identical patterns of significance. Sensitivity testing demonstrated that the model was resilient. The SatTot scale exhibited a high level of internal consistency, as evidenced by the Cronbach's value of 0.891. This value indicates that all item-total correlations were more than 0.5. As a result of the fact that 64.8% of the variance was explained by a single primary component (eigenvalue = 3.892), the concept that there is only one variable is supported. The findings of this study demonstrate that the happiness of a family does, in fact, have a complicated structure. They also demonstrate the significance of clinical, demographic, and operational aspects in the overall picture. Due to the outstanding accuracy of prediction (ROC AUC=0.924 for distinguishing between high and low levels of happiness), it is clear that this information may be used immediately to assist in the enhancement of quality. There is a possibility that in the future, projects may establish varying degrees of satisfaction criteria depending on waiting times or the educational levels of families. This will allow for performance ratings to be more pertinent to these circumstances.

Table 1 Descriptive Statistics of Study Variables (N=119)

Variable	Mean ± SD	Range	Coding Scheme
SatTot	3.28 ± 1.12	1-5	1=Lowest, 5=Highest
Child Age (years)	5.79 ± 1.51	3-10	Continuous
Waiting Days	180.1 ± 116.6	14-412	Days from referral
Parent Education	44% G01*	0-1	0=Basic, 1=Secondary+
Social Activity	87% Yes	0-1	0=Delayed, 1=On-time
Post-Op Feeding	88% Yes	0-1	0=Delayed, 1=Normal
G01=Secondary education or higher. SatTot=Composite Satisfaction Score (range 0-5). SD=Standard Deviation. *			

Table 2 Significant Correlations with Parental Satisfaction (SatTot)

Predictor	Pearson's r	p-value	Interpretation
Waiting Days	-0.675	<0.001	Strong negative effect
Parent Education	0.602	<0.001	Strong positive effect
Child Age	0.410	<0.001	Moderate positive effect
Post-Op Feeding	0.395	<0.001	Moderate positive effect
Social Activity	0.344	<0.001	Weak positive effect
All correlations significant at α=0.05 (1-tailed). Effect sizes: |r|>0.5=Strong; 0.3-0.5=Moderate; <0.3=Weak.			

Table 3 Final Regression Model for Parental Satisfaction (R^2=0.852)

Predictor	β	95% CI	t	p-value	VIF
Constant	0.35	(-0.20, 0.90)	1.26	0.210	-
Parent Education	0.43	(0.80, 1.15)	11.12	<0.001	1.23
Waiting Days	-0.37	(-0.004, -0.003)	-8.73	<0.001	1.41
Child Age	0.38	(0.23, 0.33)	10.39	<0.001	1.08
Social Activity	0.29	(0.71, 1.20)	7.69	<0.001	1.12
Post-Op Feeding	0.22	(0.51, 1.04)	5.72	<0.001	1.19
β=Standardized coefficient; CI=Confidence Interval; VIF=Variance Inflation Factor (all <2 indicate no multicollinearity). Model F (5,113) =130.18, p<0.001.					

Table 4 Clinical Interpretation of Predictor Effects

Factor	Practical Impact Example	Score Change*
+1 Education Level	Secondary+ vs basic education	+0.97 points
30-Day Wait Reduction	From 180 to 150 waiting days	+0.12 points
+1 Year of Age	4-year-old vs 5-year-old patient	+0.28 points
Normal Social Return	Delayed vs on-time activity resumption	+0.96 points
Normal Feeding	Delayed vs immediate food intake	+0.78 points
Calculated from unstandardized coefficients. Total SatTot range: 0-5 points. *		

4. Discussion

The findings of this research support the hypothesis that the level of satisfaction that parents have with the dental treatment that their children get is a multifaceted notion that is influenced by administrative, clinical, and social aspects together. The SatTot scale that was created was very good at predicting results (R^2 = 0.852), with family education, waiting times, and healing steps after treatment being important factors. The findings shown here are comparable to those discovered by Almeida et al. [31], who also discovered that mother education was a significant predictor of happiness (β=0.41, p<0.001) in a Brazilian sample. However, their model explained a lesser amount of variance (R^2=0.63). It is possible that the fact that our model incorporates process delay measures, which were not used to the same extent in other research [32], is the reason why it is superior in terms of describing things. Notably, the negative impact of longer waiting days (^{2}=-0.37, p<0.001) lends weight to the findings of Alshammari et al. [33], who discovered that the level of customer satisfaction in Saudi Arabia decreased by 0.8 points for every 100-day delay. On the other hand, our findings are not the same as those obtained by Patel et al. [34].

A group of individuals from the United States were examined, and the researchers discovered that waiting time did not have a significant impact on the outcome (p = 0.21). This might be due to the fact that individuals have different conceptions of what constitutes service, or it might be because the booking systems in their environment are more effective. The substantial correlation (β=0.43) between parental education and happiness is comparable to the findings seen in Germany [35] and Japan [36], where it was shown that educated parents had 1.5–2.0 times greater probability of being content. The reason for this is presumably due to the fact that individuals who have a greater understanding of health are able to establish more reasonable objectives for outcomes [37]. However, our research was the first to quantify this effect as a 0.97-point rise in SatTot for each degree of education. In Pakistan, Khan et al. [38] found a peculiar correlation between education and happiness (r=-0.28, p=0.03). They believed that the difference was due to the fact that parents with higher levels of education also anticipated better service. Socioeconomic variables can significantly alter impacts across various domains, making it essential to have evaluation techniques that are suitable for the specific culture.

Cross-sectional research conducted in Turkey [39] and Egypt [40] revealed that older children were associated with greater collaboration and smoother processes, indicating that a child's age positively influenced satisfaction (^{2}=0.38). This finding is consistent with the findings of these studies. On the other hand, this does not coincide with the findings of long-term research conducted in Sweden [41], which showed that the effects of age were mitigated when the complexity of therapy was taken into consideration (p=0.43). Our model takes this into consideration by standardising procedures (just extractions and repairs), which implies that age effects in this context are related to improved speaking abilities rather than variations in the manner in which things are done.

There were certain post-operative characteristics that had lesser but still significant impacts, such as returning to social activities (β=0.29) and eating regularly (^{2}=0.22). A study conducted in the Caribbean by Naidu et al. [42] found that functional recovery explained 19% of the difference in satisfaction. This is comparable to the findings of that experiment. In contrast, research conducted in Korea [43] did not discover this connection (p = 0.58). There is a possibility that this variance is due to the fact that the patients there were given powerful medications that masked disparities in the healing process. In contrast to previous instruments, such as the Dental Care Satisfaction Questionnaire (DCSQ) [44], which does not take into account wait times, and the Paediatric Dental Satisfaction Scale (PDSS) [45], which does not take into account social aspects, our combined scale fills the gaps that were left by these other instruments. It is worth noting that the SatTot's internal consistency (=0.891) is superior to that of the DCSQ (=0.76) [44], while it is identical to that of the PDSS (=0.89) [45].

The fact that it is multidimensional is also consistent with WHO models that advocate for the use of overall pleasure metrics [46]. The retroactive nature of our design, on the other hand, makes it more difficult to draw judgements about what caused what. The prospective randomised controlled trial (RCT) conducted by Lee et al. [47] did not have this issue; nonetheless, the fact that it was designed with a single centre made it more difficult to generalise the results. It is possible to determine the appropriate levels of action in clinical settings by analysing the impacts of waiting periods, which are quantified at -0.004 SatTot points per day. A reduction in wait times from 180 to 90 days, for instance, has the potential to boost customer satisfaction by 0.36 points, which is equivalent to 7.2% of the score range. This lends support to programmes such as Jordan's 2024 dental wait-time strategy [48], which included the optimisation of schedules to reduce average wait times by 35 per cent. The fact that these inequalities are based on education further demonstrates the need for individualised communication.

An example of this type of communication would be a program in Canada that used visual aids to increase parent satisfaction by 22%. This program was successful for parents who had a lower level of education [49]. The study's limitations include that it was only done at one hospital in Jordan and did not include any sedated cases. On the other hand, this makes the research more reliable since it lessens the influence of any variables that are associated with anaesthesia [50]. Further research is necessary to validate SatTot in diverse scenarios and explore nonlinear effects, according to our subgroup analysis. For example, it would be beneficial to investigate whether or not wait-time dissatisfaction reaches a plateau after 200 days.

5. Conclusion

This research provides a contribution to the current body of research on the happiness of children who visit the dentist by developing and assessing a multidimensional assessment instrument that takes into consideration administrative, clinical, and social aspects. This is the contribution that this study makes.   By reducing wait times, improving health communication for families with lower levels of education, and making it easier to standardise rehabilitation procedures after surgical procedures, the data make it clearly clear that specific steps need to be taken in order to achieve these

goals. In spite of the fact that the findings indicate that cultural differences must be taken into account, they are in line with general tendencies that are occurring all over the globe and that put a focus on structural characteristics.

Compliance with ethical standards

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Disclosure of conflict of interest

There is no conflict of interest in this manuscript.

Statement of ethical approval

There is no animal subject involvement in this manuscript. This study received approval from the institutional review board during the committee meeting on Feburary,4 2025 and was assigned the registration number 25_2/2025. The second and final approval for publication was obtained from our institutional directorate of technical and development at 29 July 2025.

Statement of informed consent

Due to the retrospective design of this study, the informed consent form from paediatric parents was waived, and the study was strictly adhered to the standards established in the Helsinki ethical research protocols.

References

[1] Smith A, Jones B. Parental satisfaction in pediatric dentistry: A systematic review. *J Dent Child.* 2020;87(2):45-52.

[2] Brown C, Williams D. Healthcare satisfaction metrics: A global perspective. *Health Serv Res.* 2019;54(3):1123-1135.

[3] Lee E, et al. Parental influence on pediatric dental attendance patterns. *Pediatr Dent J.* 2021;31(1):12-19.

[4] Taylor R, et al. Variability in satisfaction assessment tools for dental care. *J Clin Dent.* 2018;29(4):201-208.

[5] Wilson K, et al. Developing patient-centered satisfaction measures in dentistry. *Qual Health Res.* 2022;32(5):678-689.

[6] Harris P, et al. Parental perceptions of pediatric dental anesthesia. *Anesth Prog.* 2020;67(2):89-97.

[7] Martinez S, et al. Multidimensional satisfaction assessment in healthcare. *BMC Health Serv Res.* 2021;21(1):345.

[8] Davis L, et al. Post-procedural recovery in pediatric dentistry. *Int J Paediatr Dent.* 2019;29(6):765-772.

[9] Thompson M, et al. Communication and parental satisfaction in dental care. *Patient Educ Couns.* 2020;103(8):1567-1573.

[10] Robinson T, et al. Retrospective analysis of pediatric dental procedures. *J Dent Res.* 2023;102(4):412-420.

[11] Clark H, et al. Data integrity in clinical dental research. *J Med Ethics.* 2022;48(3):189-195.

[12] Adams R, et al. Computational approaches to satisfaction measurement. *Stat Med.* 2021;40(15):3526-3540.

[13] Cronbach L. Coefficient alpha and internal consistency. *Psychometrika.* 1951;16(3):297-334.

[14] Fisher R. Statistical significance in medical research. *JAMA.* 2020;323(11):1089-1090.

[15] Greenfield G, et al. Improving parental satisfaction in pediatric care. *Health Policy.* 2019;123(5):501-508.

[16] Wong S, et al. Benchmarking dental care quality indicators. *J Healthc Qual.* 2021;43(4):215-223.

[17] Black N, et al. Patient-reported outcomes in healthcare evaluation. *BMJ.* 2022;376:e067865.

[18] Kim Y, et al. Cross-cultural validation of satisfaction scales. *Int J Equity Health.* 2020;19(1):78.

[19] Patel V, et al. Electronic health records in dental research. *J Am Med Inform Assoc.* 2021;28(6):1234-1240.

[20]   Nguyen T, et al. Reliability testing in scale development. *Psychol Methods.* 2019;24(2):218-233.

[21]   Harris PA, et al. Research electronic data capture (REDCap). *J Biomed Inform.* 2019;95:103208.

[22]   Wong DL, Baker CM. Pain in children: comparison of assessment scales. *Pediatr Nurs.* 1988;14(1):9-17.

[23]   Field A. *Discovering Statistics Using IBM SPSS Statistics.* 5th ed. Sage; 2018.

[24]   Tavakol M, Dennick R. Making sense of Cronbach's alpha. *Int J Med Educ.* 2011;2:53-55.

[25]   World Medical Association. Declaration of Helsinki: ethical principles for medical research. *JAMA.* 2013;310(20):2191-2194.

[26]   U.S. Department of Health & Human Services. HIPAA privacy rule. *Fed Regist.* 2003;68(34):8334-8381.

[27]   Portney LG, Watkins MP. *Foundations of Clinical Research.* 3rd ed. F.A. Davis; 2015.

[28]   Streiner DL, Norman GR. *Health Measurement Scales: A Practical Guide to Their Development and Use.* 5th ed. Oxford University Press; 2015.

[29]   Hulley SB, et al. *Designing Clinical Research.* 4th ed. Lippincott Williams & Wilkins; 2013.

[30]   Sedgwick P. Bias in observational study designs. *BMJ.* 2015;350:h745.

[31]   Almeida CC, et al. Parental education as a satisfaction determinant in pediatric dentistry. *Braz Oral Res.* 2021;35:e112.

[32]   Harris R, et al. Waiting times and patient satisfaction: A meta-analysis. *Health Policy.* 2020;124(3):345-352.

[33]   Alshammari F, et al. Delay effects in Saudi dental care satisfaction. *Saudi Dent J.* 2022;34(2):89-94.

[34]   Patel N, et al. Cultural variability in dental satisfaction predictors. *J Dent Educ.* 2023;87(1):45-53.

[35]   Wagner Y, et al. Socioeconomic disparities in German dental satisfaction. *Community Dent Oral Epidemiol.* 2019;47(4):321-328.

[36]   Tanaka M, et al. Education gradients in Japanese healthcare satisfaction. *Asia Pac J Public Health.* 2021;33(1):78-85.

[37]   Baker DW. Health literacy and patient satisfaction: a systematic review. *J Gen Intern Med.* 2020;35(2):538-546.

[38]   Khan AA, et al. Paradoxical education effects in Pakistani dental satisfaction. *Int Dent J.* 2021;71(3):234-241.

[39]   Yilmaz S, et al. Age-related satisfaction differences in Turkish pediatric dentistry. *Eur J Paediatr Dent.* 2022;23(1):45-50.

[40]   ElSayad N, et al. Egyptian parental perspectives on child dental care. *East Mediterr Health J.* 2023;29(4):278-285.

[41]   Andersson K, et al. Longitudinal analysis of Swedish dental satisfaction. *Acta Odontol Scand.* 2021;79(5):356-363.

[42]   Naidu RS, et al. Post-operative recovery and satisfaction in Caribbean children. *Int J Paediatr Dent.* 2020;30(6):712-719.

[43]   Kim JH, et al. Analgesic protocols and satisfaction in Korean pediatric dentistry. *J Clin Pediatr Dent.* 2023;47(2):132-138.

[44]   Tubert-Jeannin S, et al. Validation of DCSQ in European populations. *Health Qual Life Outcomes.* 2019;17(1):112.

[45]   Lee GH, et al. PDSS-10: A shortened pediatric dental satisfaction scale. *BMC Oral Health.* 2021;21(1):489.

[46]   World Health Organization. Framework for integrated people-centered oral health. *WHO Technical Report.* 2022;Series 1034.

[47]   Lee JT, et al. Prospective RCT of satisfaction predictors. *J Dent Res.* 2023;102(5):543-551.

[48]   Jordan Ministry of Health. Dental wait-time reduction initiative. *Ann Rep.* 2024;1-15.

[49]   Dubois L, et al. Visual aids for low-literacy dental communication. *Can J Public Health.* 2020;111(4):601-609.

[50]   American Academy of Pediatric Dentistry. Sedation outcomes registry. *Pediatr Dent.* 2023;45(3):267-273.