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Original Article

Parental perceptions and acceptance of silver diamine fluoride treatment in Kingdom of Saudi Arabia

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ABSTRACT

Objectives: Dental caries managed through two main approaches: Treatment and prevention; one of the recently preventive measures is silver diamine fluoride (SDF), which proven to be a cost effective, minimally invasive, and handy. SDF also is a treatment that could be chosen for uncooperative patients to stop active caries. SDF has drawbacks, and one of these is staining, which may raise esthetic concerns.

Materials and Methods: This was a cross-sectional study, and the collected data were obtained from Saudi volunteers in Kingdom of Saudi Arabia. Questionnaire designed to obtain demographic data from participants and their opinion about the staining was shown in the photographs after using SDF on primary teeth.

Results: Of the 222 participants, when we asked their opinion about the staining, we found that the majority reject this type of treatment. In our analyses, there was statistically significant difference in acceptance ratings between male and female with SDF on posterior teeth ($P > 0.05$).

Conclusion: The majority reject this type of treatment. There was a difference in acceptance to the treatment between anterior and posterior teeth. Dentist should provide informed consent form which includes clear photographs showing expected staining, especially when treating anterior teeth.

Keywords: Acceptance, dental caries, Kingdom of Saudi Arabia, prevention, primary teeth, silver diamine fluoride, staining

Introduction

Dental caries remains the most common childhood disease.[1] It affects all social and demographic layers of societies. However, caries risk is a variable among populations, and there are high-risk and low-risk populations.[2] Different factors could control the level of caries risk, for instance, socioeconomic status, diet, level of educations, and other demographic factors.[3] Giving that dental caries is a global issue, scientific institutions and research centers all over the world have spent time, effort, and money to find an effective solution for dental caries. Furthermore, dental caries was known to be managed through two main approaches: Treatment, which includes drill and fill; and prevention, which depends on cease the process of caries formation at an early stage. Logically, the last approach is more effective. One of the recently marketed preventive measures of dental caries is silver diamine fluoride (SDF), which proven to be a cost-effective, minimally invasive, and handy.[4-6] More important, it has shown a noticeable success rate in caries prevention, especially in early childhood caries cases.[7-9] It provides families with an alternative solutions for managing dental caries, particularly if the caries at early stage, and has not shown any symptoms. Moreover, it could save time and effort for both the family and the dental team. SDF also is a harmless treatment that could be chosen for uncooperative patients to stop active caries. Consequently, it can prevent any emotional and psychological impacts, which may happen as a result of more invasive treatment options. As most of the medicaments, SDF has its drawbacks. On top of these drawbacks is staining. It causes dark stains on enamel and dentin, which may raise esthetic concerns.[10] However, parents have different attitudes toward using SDF considering its positives and negatives. The study measured parental acceptance about this treatment option A study, which was conducted in China, showing low parental concern about staining following SDF application.[11] However, another study that was conducted in the states indicated a different tolerability level.[12] It seems that parents could tolerate SDF staining in the posterior teeth more than the anterior teeth.[13]

Materials and Methods

In this cross-sectional study, collected data were obtained from 222 Saudi volunteers living in Kingdom of Saudi Arabia (KSA). The purpose of this research is to measure the SDF

acceptability by parents and relate demographic data to this type of treatment. Purposeful questionnaire was designed and used for collection of the required data. The following information were obtained from each participants: Age, sex, level of education, income, moreover, their opinion about the staining as shown in the photographs after using SDF on the anterior and posterior primary teeth.

We conducted the questionnaire with the introduction about SDF which contains advantages, disadvantages, indications, and contraindications of using SDF as well as photographs show pre/post-operative anterior and posterior teeth treated with SDF.[12]

To evaluate parent's acceptance to this treatment option, we presented standard photographs [Figure 1], and the photographs show carious teeth before any treatment and stained enamel as well as dentin in both anterior and posterior teeth after SDF treatment.

The questionnaire was drafted with a 5-point Likert scale ranging from strongly accept, accept, neutral, refuse, and strongly refuse. Data were coded and keyed into the Statistical Product and Service Solutions software version 21 (SPSS Inc., Chicago, IL) for analysis and to perform Pearson Chi-square test for statistical significance (*P* value). $P < 0.05$ was considered statistically significant. Each participant was asked to sign a written ethical consent during the questionnaire's interview. The informed ethical consent form was designed and approved by the Ethical Committee of the University of Hail, KSA.

Results

In this study, a total of 222 parents completed the survey and provided their demographic information. All of the parents had at least one child who had experienced dental caries in the past, so they were familiar with the process of having teeth with caries restored.

Of the 222 participants, 87/222 (39.2%) were males and 135/222 (60.8%) were females giving male:females ratio of 1.00:1.55 as shown in Figure 2 and their ages ranging from 20 to 52 years. The great majority of the participants were in the age range of 31–40 years representing 103/222 (46.4%), followed by age ranges 41–50 (41.0%) as indicated in Figure 3.

When we asked their opinion about the staining shown in the photographs, We found most of parents judged staining on the anterior teeth to be esthetically not acceptable (Strongly Refuse 90%). As well as, parents judged staining on the posterior teeth to be also not acceptable (refuse 28.4% and strongly refuse 68.5 %) as shown in Tables 1 and 2.

In a more detailed analysis of SDF acceptability, we compared the age group depending on tooth location (anterior–posterior). In terms of tooth location, we found that there was

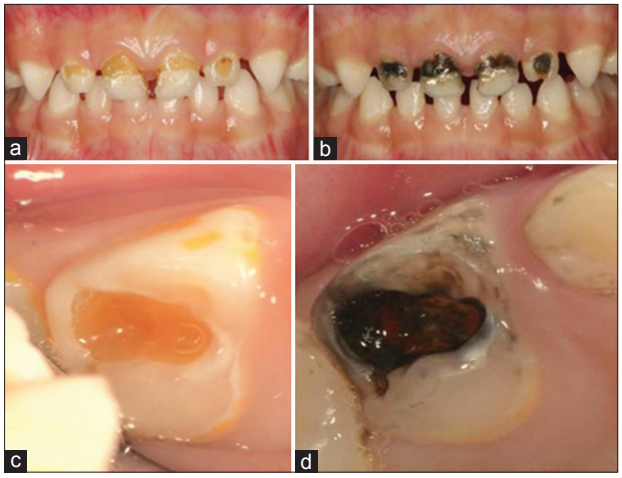

Figure 1: (a-d) Before and after the application of silver diamine fluoride

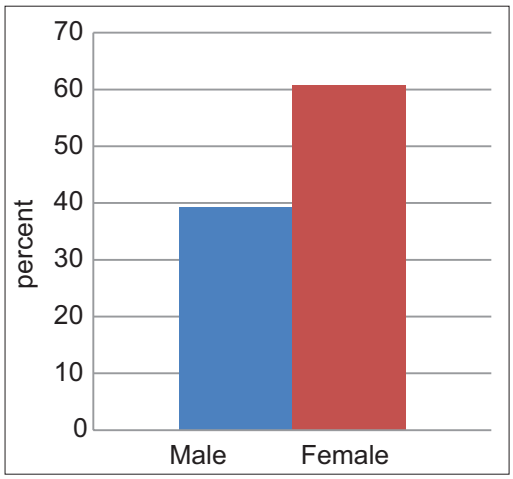

Figure 2: Study population by gender

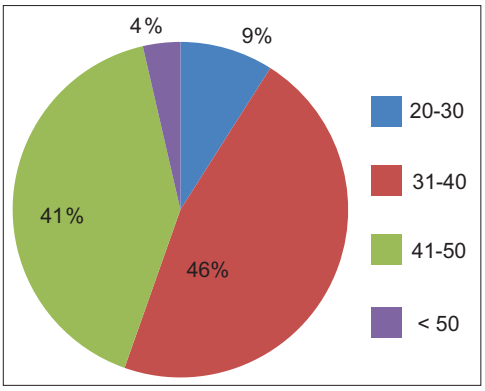

Figure 3: Study population by age

no statistically significant difference in parental ratings of using SDF on the anterior and posterior teeth with $P = 0.623$ ($P < 0.05$) [Figures 4 and 5].

In our additional analyses, we added parental gender to determine the potential moderating effects on parental acceptance ratings.

Table 1: Parental acceptance ratings of using SDF on the posterior teeth

Answer	Frequency (%)
Neutral	7 (3.2)
Refuse	63 (28.4)
Strongly refuse	152 (68.5)
Total	222 (100.0)

SDF: Silver diamine fluoride

Table 2: Parental acceptance ratings of using SDF on the anterior teeth

Answer	Frequency (%)
Refuse	22 (9.9)
Strongly refuse	200 (90.1)
Total	222 (100.0)

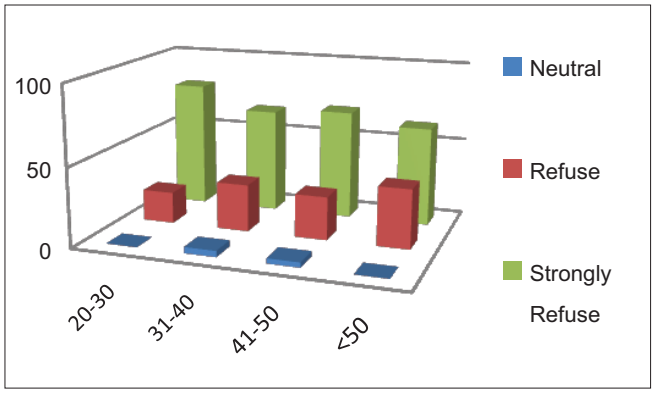

Figure 4: Effects of age on treatment acceptance (posterior teeth)

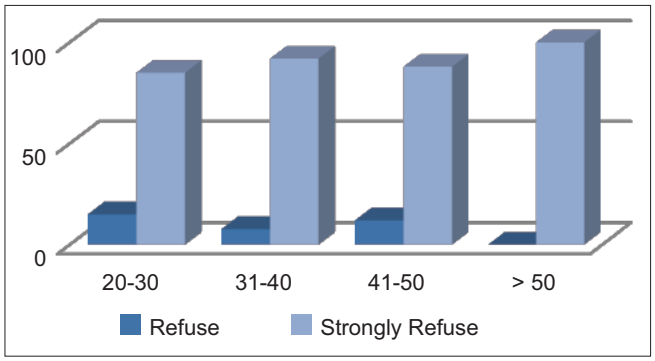

Figure 5: Effects of age on treatment acceptance (anterior teeth)

According to Figure 6, there was a statistically significant difference in acceptance ratings between male and female with SDF on posterior teeth in $P = 0.019$ ($P > 0.05$) by applying Independent sample *t*-test. However, there was no difference in acceptance ratings between male and female with SDF on anterior teeth in $P = 0.173$ ($P < 0.05$) as shown in Figure 7.

Figures 8 and 9 show the effects of education on the acceptance of treatment; it was evident that parents had a low acceptance of staining. Moreover, parents who had a lower level of education strongly refused by 100% on using SDF on anterior

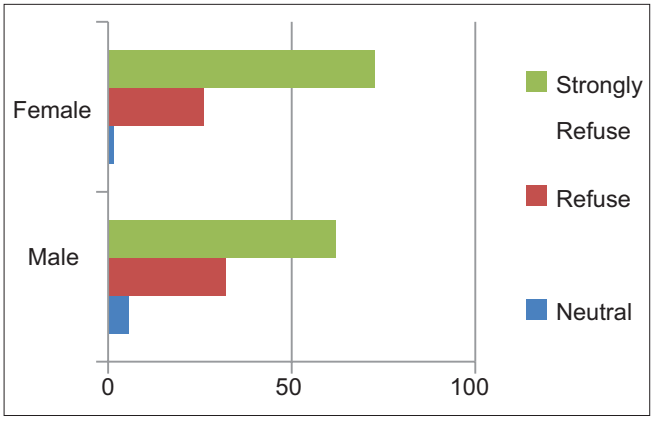

Figure 6: Effects of gender on treatment acceptance (posterior teeth)

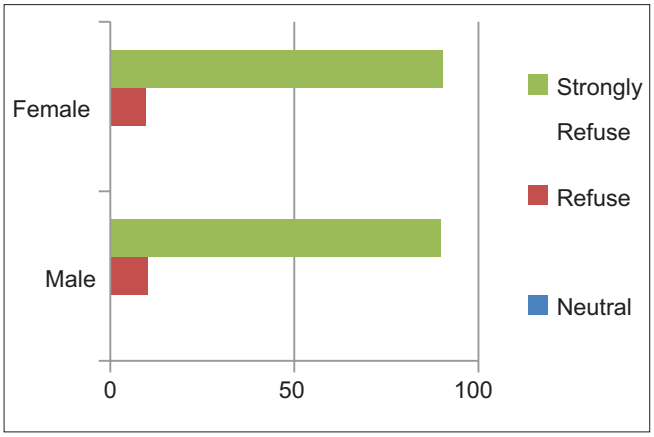

Figure 7: Effects of gender on treatment acceptance (anterior teeth)

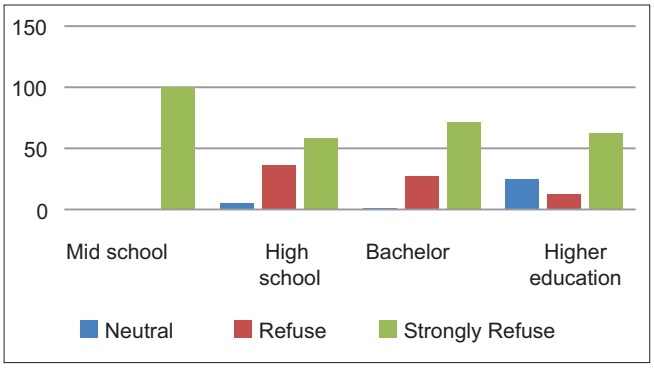

Figure 8: Effects of level of education on treatment acceptance (posterior teeth)

and posterior teeth, while other parents approximately in the same range. Similar trends were evident for the groups defined by income as shown in Figures 10 and 11.

Discussion

There is a lack of literature regarding SDF uses and acceptance. In fact, our study is the first to concentrate on SDF parental acceptance in the Middle East. Parents could tolerate SDF staining in the posterior teeth more than the anterior teeth in

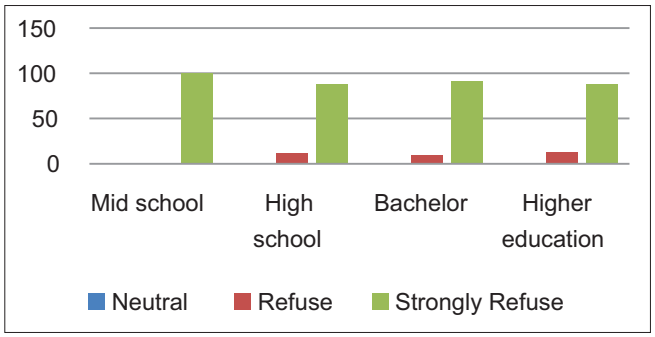

Figure 9: Effects of level of education on treatment acceptance (anterior teeth)

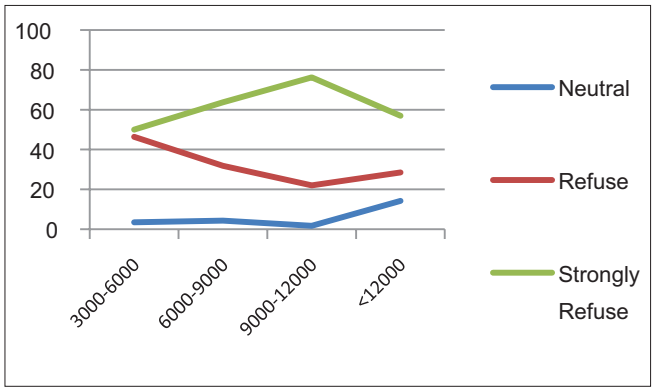

Figure 10: Effects of income on treatment acceptance (posterior teeth)

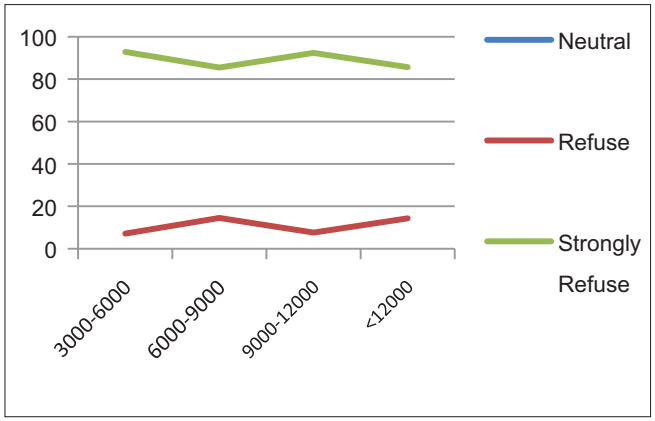

Figure 11: Effects of income on treatment acceptance (anterior teeth)

a study that was conducted in the United States as well as in this study.

In our study, we received 260 participants; however, we excluded 38 participants due to incomplete questionnaire, double reporting, and participants without previous experience. The questionnaire was drafted with a 5-point Likert scale ranging from strongly accept, accept, neutral, refuse, and strongly refuse. Nor strongly accept neither accept were chosen by any of the participants regarding the question related to posterior teeth. Similarly, none of the participants had chosen strongly accept, accept, or neutral regarding the question related to anterior teeth.

The questionnaire divided the age groups into four different age groups (20–30, 31–40, 41–50, and more than 50 years old); the most trending group was between 31 and 40 years old which is reasonable due to Saudi population in age group between 20 and 44 by 41.8% of the population. Moreover, this age group was the most group to reject this treatment option by 92% (strongly refuse) to the anterior teeth and 66% (strongly refuse) to the posterior teeth.

Parents judged staining on the anterior teeth to be esthetically not acceptable (strongly refuse by 90%).

In fact, Saudi's social and economic lifestyle indicates these statistical results. Likewise, in the posterior teeth, parents judged SDF as not acceptable treatment option by refuse (28.4%) and strongly refuse (68.5 %) because they are aware of other treatment options provided in primary health care, general hospitals, or private institutions that give better esthetic result.

In regard to the gender, about 40% of the participants were male and 60% were female. Ordinarily, mothers can take the decisions about the treatment and they were more cooperative with this study. Besides, there was statistically significant difference in acceptance ratings between male and female with SDF on the posterior teeth in *P* value ($P > 0.05$) but not the anterior teeth.

Conclusion

Although there are not many studies in the literature on SDF, we conduct this study to measure parental acceptance about this treatment option.

After showing before and after SDF treatment photographs to the parents, the majority of them reject this type of treatment; undoubtedly, there is a difference in acceptance to the treatment between the anterior and posterior teeth.

Dentist should provide informed consent form which includes clear photographs showing expected staining, especially when treating anterior teeth.

Conflicts of Interest

No potential conflict of interest was reported by the authors.

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