



Knowledge on Silver Diamine Fluoride in Pediatric Dentistry Among Dental Students in Tamilnadu- A Questionnaire-Based Survey

A Anusre ^a, Joyson moses ^b, Evansal Ranj J ^c

^aDental resident, Thai Moogambigai Dental College and Hospital

^bHOD, Department of Pedodontics, Thai Moogambigai Dental College and Hospital

^cTutor, Department of Pedodontics, Thai moogambigai Dental College and Hospital

Abstract:

Background: Silver Diamine Fluoride (SDF) is a colorless alkaline liquid applied topically with the combined effects of silver and fluoride that significantly arrest dental caries. SDF can serve as an effective choice, particularly for children who cannot tolerate traditional dental treatment.

Aim: The present online-based questionnaire study was aimed to assess the knowledge of various application aspects of Silver Diamine Fluoride in pediatric dentistry among dental students across Tamilnadu based on their clinical experience.

Methodology: A questionnaire-based online cross-sectional survey was conducted among dental students across Tamilnadu using Google forms distributed through various social media platforms. The scores were evaluated based on responses, and relevant statistical analysis was performed using SPSS (Statistical Package for the Social Sciences) statistics Version 22.0.

Result: Only 60% of respondents predominantly CRRIs 35 (23.3%) among undergraduates have heard about the use of SDF in pediatric dentistry ($p < .05$). More than half of the respondents (56%) were not aware of the antibacterial action of SDF in the oral cavity ($p < .05$) while lower/incorrect responses were observed on questions on the amount of fluoride in SDF, nature of tooth staining, type of staining and mechanism of action. Nonetheless, 88% firmly agrees with using SDF as an option for treating pediatric patient in future practice.

Conclusion: Significant lack of knowledge on clinical aspects of SDF among undergraduate students clearly shows the need for implementation of educational experience with clinical practice that would positively contribute towards knowledge, attitude, and use of SDF as an effective preventive material in pediatric dentistry.

Keywords: Arrested caries, Children, Discoloration, Fluoride, Knowledge, Parental acceptance.

Introduction:

Dental caries remains to be the most common, complex chronic disease of childhood in India with a higher prevalence rate ranging from 50.8% to 62.4% despite several preventive measures, advanced restorative procedures, and significant attention established in day-to-day dental practice [1, 2]. In 1978, The American Academy of Pediatric Dentistry (AAPD) released the term "Nursing Bottle Caries" as a phenomenon associated with bottle feeding habits, however subsequent understanding over the next two decades, AAPD recognized a distinctive clinical pattern of dental caries in children that was not consistently related to poor feeding practices (formerly termed "nursing bottle caries", "baby bottle tooth decay") and adopted the term "Early Childhood Caries" (ECC). ECC is a multifactorial disease of the primary tooth with the presence of one or more decayed (non-cavitated or cavitated), missing (due to caries), or filled tooth surfaces in a 71 months of age or younger child. Since then, the AAPD has been actively encouraging and urging community oral health care providers, school health care providers, caretakers, health instructors, and several other organizations involved in oral health practices to implement preventive measures to decrease a child's risk of this multifactorial devastating disease [3-5].

Prevention and control of dental caries in children is a challenging task that largely depends on several factors such as psychological influences, demographic locations, urban-rural variations, socio-economic groupings, culture, age-related variations, and attitude toward oral hygiene, dental care availability, and urge towards a need for quick, inexpensive, non-invasive painless procedures [6]. Several control measures such as early detection of caries, caries risk assessment, diet counseling, plaque control methods, incorporation of effective oral hygiene practices, along with caries prevention by use of fluoride supplements as dental sealants, in-office fluoride application, dentifrices and sugarless or xylitol chewing gum are used invariably across the world [7, 8]. One such advanced therapeutic material that has proved itself to be a reliable caries arrest agent when traditional removal of caries and restoration with a permanent material mode of dental treatment could not be provided conveniently is Silver Diamine Fluoride (SDF) [9].

SDF is a colorless alkaline liquid applied topically with the combined effects of silver and fluoride that enhances the mineral content of dental hard tissues, promotes absorption of calcium, and induces remineralization thus directly aiding in the prevention and arrest of actively progressing dental caries [1, 10, 11]. In 2014, Food and Drug Administration (FDA), U.S recommended SDF in the treatment of tooth hypersensitivity similar form as fluoride varnish. The American Academy of Pediatric Dentistry (AAPD) also suggests 38% SDF for caries prevention, to arrest cavitated lesions in primary teeth as a comprehensive treatment option [1, 4, 5, 9]. SDF is often used as an alternative treatment option in pediatric patients with cognitive and/or physical impairments, low tolerance to dental treatment, and in relative health risk cases for general anaesthesia to arrest cavitated carious lesions and also to treat hypersensitivity [10-12].

Studies by Horst JA et al [9], Mei ML et al [10], Shah SG et al [13], and Yee et al, [14] showed a significant reduction in the arrested carious lesion that largely depends on type and time of application, dose-response effectiveness and active caries risk. A Systematic review by Wilson TG also observed the use of SDF could be a therapeutic choice for caries administration at the cavitation degree among pre-school children, especially people that have poor access to dental hygiene [15]. Several disadvantages such as teeth discoloration, and allergic reactions to metallic compounds were also reported over the years [1, 3, 6, 10-12]. Despite allowing the arrest of dental caries, cost-effective, easy application, topical medicament, and effective innovative method of managing cavitated caries lesions, SDF implementation as a preventive and therapeutic material among dental students is not fully established [16, 17]. Hence a brief understanding of the applications, contraindications, advantages, and disadvantages of SDF plays an important role in the comprehensive management of pediatric patients. Thus, the present survey was aimed to assess the existing knowledge of Silver Diamine Fluoride in pediatric dentistry among dental students across Tamilnadu based on their educational and clinical experience.

Materials and methods:

A questionnaire-based cross-sectional assessment survey was carried out amongst the dental students across Tamilnadu to assess their knowledge of various application aspects of Silver Diamine Fluoride (SDF) in pediatric dentistry based on their clinical experience. After obtaining the Ethical clearance, the prerequisite information was collected and 14 relevant questions were prepared using available evidence-based literature about the present study. The self-administered questionnaire was distributed among undergraduate and postgraduate dental students with few selected responses to specific questions along with close-ended questions (Yes/ No/ don't know) in the English language. Since this study was carried out during the COVID-19 Pandemic situation, online Google forms were generated and circulated through various social media platforms.

Statistical Assessment:

Non-probability random sampling method was employed that yielded information from 150 dental students across Tamilnadu taken into this cross-sectional observational study. Responses recorded were evaluated using SPSS (Statistical Package for the Social Sciences V22.0 Illinois, Chicago) software Version 22.0. The internal consistency of the questionnaire was adequate (Cronbach's alpha = 0.795). All the study participants were instructed about the purpose of the study and pre-filled online consent was obtained before the survey through Google forms and guaranteed that their participation was purely voluntary.

Results:

On analysis of the given data the mean age of the study population was observed as 21.06 ± 2.288 years (mean \pm S.D) with 0.3692 at a 95% confidence level comprising 63 (42%) male and 87 (58%) female participants categorized as I-II year undergraduate dental students (34%), III-IV year undergraduate dental students (28%), CRRIs (27.34%) and postgraduate dental students (10.66%) respectively.

Among the study participants, only 90 (60%) respondents predominantly CRRIs 35 (23.3%) followed by III-IV years 25 (16.6%) have heard about the use of Silver Diamine Fluoride in pediatric dentistry ($p < .05$) (Q1) through online dental platforms 20 (22.22%) and dental textbooks 11 (12.22%) as the major source of information ($p < .05$) whereas I-II year 36 (60%) were unfamiliar with its application ($p < .05$) (Q2). 56 (37.33%) out of 150 participants majority being I-II years 34 (22.6%) followed by III-IV years 12 (8%) were not aware of the antibacterial action of SDF in the oral cavity ($p < .05$) while 13 out of 16 (81%) postgraduates responded correctly (Q3). 77 out of 150 (51.33%) being III-IV years consider silver has the primary antibacterial action ($p < .05$) while 61 out of 150 (40.6%) predominantly postgraduates answered fluoride action provides the antibacterial activity ($p < .05$) (Q4). 16 out of 25 (60%) I-II years replied with a "False" response on the cariogenic role of SDF in dentinal tubules while other participants responded "TRUE" mechanism of action (Q6) ($p < .05$).

The Majority of lower/incorrect responses were observed between undergraduate and postgraduate students when questioned on the amount of fluoride in SDF (Q5), zombie effect in SDF (Q7), nature of tooth staining (Q8), type of staining caused by Silver Diamine Fluoride stain (Q9). 98 out of 150 (65%) recommend the use of SDF based on the caries risk of an individual (Q11) while 88% of the study population (132 out of 150) think SDF can be the best option for managing caries in pediatric patients with cognitive and/or physical impairments (Q12) though 129 out of 150 (86%) never had any clinical experience using SDF (Q13). On the contrary, 66.6% (100 out of 150) consider allergic reactions, and discolorations of soft and hard tissues to be the chief disadvantages of SDF application (Q10) despite 88% of respondents firmly agree with using SDF as an option for treating a pediatric patient in future practice (132 out of 150) (Q14) (Table 1). The overall knowledge analysis showed no significant difference though slightly higher scores were observed among postgraduates followed by CRRIs (Graph 1).

Discussion:

Management of dental caries in children can be a challenging task that requires advanced skills, high-cost instrumentation, and cooperation, especially in a young child with limited coping ability. In such clinical situations arresting caries progression has been proposed to manage untreated dental caries to avoid further complex disease progression. SDF, a fluoridated agent was introduced in the field of pediatric dentistry to halt the caries process and simultaneously prevent the formation of new caries. The present study conducted among undergraduate and postgraduate dental students to assess their knowledge of SDF showed 60% of the respondents predominantly CRRIs (23.3%) followed by III-IV years (16.6%) have heard about the use of Silver Diamine Fluoride in pediatric dentistry. Studies by Balaji V & Mathew MG [3], M Zakirulla et al [16], Alajlan G et al [17] and Dang C et al [18] also showed similar responses (undergraduates) while few questions were not consistent with observations made in this study.

About 57.3% undergraduates and 81% postgraduates agreed that SDF can be used to arrest cavitated lesions owing to its antibacterial activity similar to the existing literature. Studies by Balaji V & Mathew MG [3], M Zakirulla et al [16], Alajlan G et al [17], Dang C et al [18] and Chibinski et al [19], showed a better acceptance rate and agreed SDF would be far better than other alternative remedies or placebo in arresting dental care caries in case of primary dentition. This could be attributed to increasing educational training, and professional development programs on SDF application among pediatric postgraduates when compared to undergraduates and other specialty postgraduates since it is predominantly used in children. Nelson et al also reported that 79.9% of pediatric dentistry curricula in the US have included SDF in the management of arrested caries [20].

The Majority of lower/incorrect responses were observed between undergraduate and postgraduate students when questioned on the amount of fluoride in SDF, the concentration of SDF used, and its mechanism of action. Jabin Z et al [1], M Zakirulla et al [16], Llodra JC et al [21] and Magno MB et al [22] reported free fluoride concentration of SDF is around 44,800 ppm and silver concentrations maybe around 255,000 ppm. Studies by Yee R et al [14], Fung MHT et al [23], and Tolba ZO et al [24] showed that 38% SDF has greater efficacy with increased caries arrest rate than other concentrations. In the present study, undergraduates believed silver has the primary antibacterial action while postgraduates answered fluoride action provides the antibacterial activity. M Zakirulla et al [16], Alajlan G et al [17] and Nelson T et al [20] reported that silver particles act on proteins, making sure the antibacterial activity of SDF. However efficacy, safety, and mechanism of action at these higher concentrations of SDF/Fluoride in all these studies were not completely established suggesting a need for In-vivo/In-vitro studies, and clinical trials at varying concentrations with perceived outcomes.

In the present study 66.6% consider allergic reactions, and discolorations of soft and hard tissues as the most common disadvantages of SDF application in children. Studies by Jabin Z et al [1] and Alajlan G et al [17] revealed adverse reactions with gingival contact. Studies by Jabin Z et al [1], Hiremath AM et al [12], Shah SG et al [13], M Zakirulla et al [16], and Cernigliaro et al [25] also showed a higher incidence of black discoloration or staining of the carious surface. Regardless of antimicrobial effectiveness, silver contaminants, however, have the effect of causing blackening of carious enamel and dentin. SDF should be used with caution among children who might not be comfortable with the black discoloration of the teeth, especially in the anterior teeth regions nonetheless can be a treatment of choice in posterior teeth.

More than two-thirds (88%) of the study population think SDF can be the best option for managing caries in pediatric patients with cognitive and/or physical impairments. Similar studies by Akshitha E et al [6], Monse et al [26], Gordon NB [27], Bagher et al [28] and Nguyen V et al [29] also observed more than 60% of parents accept SDF in children who had previously shown uncooperative behavior to conventional restorations or children who need more specialized behavior modifications during dental care. Majority (88%) of respondents firmly agree with using SDF as an option for treating a pediatric patient in future practice. This is consistent with results by Jabin Z et al [1], Hiremath AM et al [12], Alajlan G et al [17] and Antonioni MB et al [30] that showed more than half of those who answered the question regarding the expectation of the future use of SDF were positive and expected it would increase. Suggesting that higher parental acceptance despite discolorations and esthetical compliances of SDF application is related to willingness towards non-invasive techniques rather than more extensive behavior modification techniques.

Conclusion:

Within the limitations of this study, a significant lack of knowledge on clinical aspects of SDF use in the paediatric population among undergraduate dental students was noted. Implementation of SDF teaching in undergraduate dental curriculum, and professional development through continuing dental education programs, training workshops, dental journals/other publications, and updating online resources by increasing self-reporting of SDF would positively contribute towards knowledge, attitude, and its use in pediatric dentistry. However further studies on the application of SDF in a non-carious tooth under controlled environment with modified composition to avoid tooth surface staining may serve as a useful preventive material of choice in management of dental caries in the near future.

References:

1. Jabin Z, Vishnupriya V, Agarwal N, Nasim I, Jain M, Sharma A. Effect of 38% silver diamine fluoride on control of dental caries in primary dentition: A Systematic review. *J Family Med Prim Care*. 2020 Mar 26; 9(3):1302-1307.
2. Mehta A. Trends in dental caries in Indian children for the past 25 years. *Indian J Dent Res*. 2018; 29:323.
3. Balaji V, Mathew MG. Knowledge and Awareness on Silver Diamine Fluoride among Paediatric Dentists and Post Graduates in India-A Survey. *JPRI* 2020; 32(16): 168-176.

4. American Academy of Pediatric Dentistry. Symposium on the prevention of oral disease in children and adolescents. Chicago, Ill; November 11-12, 2005: Conference papers. *Pediatr Dent* 2006; 28(2):96-198.
5. American Academy of Pediatrics. Policy on early childhood caries (ECC): classifications, consequences, and preventive strategies. *Pediatric dentistry*. 2008; 30(7 Suppl):40-3.
6. Akshitha E, Girish SR, Shankar S, Lalithambigai G, John S. Assessment of parental perceptions and acceptance of silver diamine fluoride staining among the children with dental caries experience in a Town in South India – A cross-sectional study. *J Global Oral Health* 2022; 5:20-4.
7. Rethman MP, Beltrán-Aguilar ED, Billings RJ, Burne RA, Clark M, Donly KJ, Hujoel PP, Katz BP, Milgrom P, Sohn W, Stamm JW. Nonfluoride caries-preventive agents: executive summary of evidence-based clinical recommendations. *The Journal of the American Dental Association*. 2011 Sep 1; 142(9):1065-71.
8. Riley III JL, Richman JS, Rindal DB, Fellows JL, Qvist V, Gilbert GH, Gordan VV. Use of caries prevention agents in children: findings from the dental practice-based research network. *Oral health & preventive dentistry*. 2010; 8(4):351.
9. Horst JA, Ellenikiotis H, Milgrom PM, UCSF Silver Caries Arrest Committee. UCSF protocol for caries arrest using silver diamine fluoride: rationale, indications, and consent. *Journal of the California Dental Association*. 2016 Jan; 44(1):16.
10. Mei ML, Ito L, Cao Y, Lo EC, Li QL, Chu CH. An ex vivo study of arrested primary teeth caries with silver diamine fluoride therapy. *J Dent*. 2014; 42: 395–402.
11. Chu CH, Lo EC, Lin HC. Effectiveness of silver diamine fluoride and sodium fluoride varnish in arresting dentin caries in Chinese pre-school children. *J Dent Res*. 2002; 81:767–70.
12. Hiremath A M, Anbu V, Kuduruthullah S, Khalil E, Elsahn NA, Samuel S R. Acceptability of silver diamine fluoride as interim measure towards untreated dental caries and its impact on ohrqol among children with HIV: Pilot study. *Indian J Dent Res* 2020; 31:502-6.
13. Shah SG, Bhaskar V, Chawla S, Venkataraghavan K, Choudhary P, Ganesh M, et al. Efficacy of silver diamine fluoride as a topical fluoride agent compared to fluoride varnish and acidulated phosphate fluoride gel: An in vivo study. *J Pediatr Dent*. 2014; 2:5–12.
14. Yee R, Holmgren C, Mulder J, Lama D, Walker D, van Palenstein Helder W. Efficacy of silver diamine fluoride for arresting caries treatment. *J Dent Res*. 2009; 88:644–7.
15. Wilson TG. Silver diamine fluoride receives new FDA designation. *Decisions Dent* 2016; 2:10.
16. M Zakirulla, Ahmed Ali Althuqbi, Hassan I Asiri, Thamra M Alqahtani, Albatoool Mohammed Alqahtani, Abeer A Alghothimy et al. Dentists' Education, Knowledge and Attitudes towards Silver Diamine Fluoride, *J Res Med Dent Sci*, 2021, 9 (1): 186-191.
17. Alajlan G, Alshaikh H, Alshamrani L, Alanezi M, Alarfaj S, AlSwayyed T. Knowledge on and Attitude toward Silver Diamine Fluoride among Saudi Dental Practitioners in Riyadh Public Hospitals. *Clin Cosmet Investig Dent*. 2020 Sep 30; 12:399-407.
18. Dang C, Connick CL, Tabrizi M, Kaufman L, Soto A, Smith BM, et al. Assessment of knowledge and perception about silver diamine fluoride (SDF) for treating older adults among graduating dental students. *J Dent Educ*. 2020 Nov; 84(11):1210-1218.
19. Chibinski AC, Wambier LM, Feltrin J, et al. Silver Diamine fluoride has efficacy in controlling caries progression in primary teeth: A systematic review and meta-analysis. *Caries Res* 2017; 51:527–541.
20. Nelson T, Scott JM, Crystal YO, et al. Silver diamine fluoride in pediatric dentistry training programs: survey of graduate program directors. *Pediatr Dent* 2016; 38(3):212-7.
21. Llodra JC, Rodriguez A, Ferrer B, Menardia V, Ramos T, Morato M. Efficacy of silver diamine fluoride for caries reduction in primary teeth and first permanent molars of schoolchildren: 36-month clinical trial. *Journal of dental research*. 2005 Aug; 84(8):721-4.
22. Magno MB, Silva LP, Ferreira DM, Barja-Fidalgo F, Fonseca-Gonçalves A. Aesthetic perception, acceptability and satisfaction in the treatment of caries lesions with silver diamine fluoride: a scoping review. *International Journal of Paediatric Dentistry*. 2019 May; 29(3):257-66.
23. Fung MHT, Duangthip D, Wong MCM, Lo ECM, Chu CH. Randomized clinical trial of 12% and 38% silver diamine fluoride treatment. *J Dent Res*. 2018; 97:171–8.
24. Tolba ZO, Hamza HS, Moheb DM, Hassanein HE, El Sayed HM. Effectiveness of two concentrations 12% versus 38% of silver diamine fluoride in arresting cavitated dentin caries among children: A systematic review. *Gaz Egypt Paediatr Assoc*. 2019; 67:1.
25. Cernigliaro D, Kumar A, Northridge ME, Wu Y, Troxel AB, Cunha-Cruz J, et al. Caregiver satisfaction with interim silver diamine fluoride applications for their children with caries prior to operating room treatment or sedation. *J Public Health Dent* 2019; 79:286-91.

26. Monse B, Heinrich-Weltzien R, Mulder J, Holmgren C, van Palenstein Helderma WH. Caries preventive efficacy of silver diamine fluoride (SDF) and ART sealants in a school-based daily fluoride toothbrushing program in the Philippines. BMC oral health. 2012 Dec; 12(1):1-9.
27. Gordon NB. Silver diamine fluoride staining is acceptable for posterior primary teeth and is preferred over advanced pharmacologic behavior management by many parents. Journal of Evidence Based Dental Practice. 2018 Mar 1; 18(1):94-7.
28. Bagher SM, Sabbagh HJ, AlJohani SM, Alharbi G, Aldajani M, Elkhodary H. Parental acceptance of the utilization of silver diamine fluoride on their child's primary and permanent teeth. Patient preference and adherence. 2019; 13:829.
29. Nguyen V, Neill C, Felsenfeld J, Primus C. Potassium iodide. The solution to silver diamine fluoride discoloration. Health. 2017; 5(1):555655
30. Antonioni MB, Fontana M, Salzmann LB, Inglehart MR. Pediatric dentists' silver diamine fluoride education, knowledge, attitudes, and professional behavior: a national survey. J Dent Educ. 2019; 83(2):173–182.

Tables and Graph:

Table 1: Table showing the Questionnaire Responses (N %) among the study population:

Graph 1: Graph showing the overall knowledge score among the study population:

Table showing the Questionnaire Responses (N %) among the study Population:

S NO	QUESTIONS	OPTIONS	I-II Years N (%)		III-IV years N (%)		CRRI N (%)		PG's N (%)		TOTAL N (%)		p-value
1	Have you heard about Silver Diamine Fluoride?	Yes	15	10%	25	16.6%	35	23.3%	15	10%	90	60%	<.00001*
		No	36	24%	17	11.3%	6	4%	1	0.6%	60	40%	
2	If yes, from which resources?	Dental books	11	12.2%	3	3.33%	10	11.1%	4	4.44%	28	31.1%	<.00001*
		Online resources	3	3.33%	20	22.22%	19	21.11%	2	2.22%	44	48.8%	
		Educational programs	1	1.11%	2	2.22	6	6.66%	9	10%	18	20%	
3	What is SDF?	An antibacterial liquid used to treat active dental caries and prevent further progression of disease.	16	10.66%	28	18.66%	29	19.33%	13	8.66%	86	57.3%	.00026*
		An antibiotic liquid used to help promote oral hygiene.	1	0.66%	2	1.33%	4	2.66%	1	0.66%	8	5.33%	
		Not aware	34	22.66%	12	8%	8	5.33%	2	1.33%	56	37.33%	
4	Which component provide antimicrobial activity?	Silver	21	14%	35	23.33%	20	13.33%	1	0.66%	77	51.3%	<.00001*
		Diamine	6	4%	1	0.66%	3	2%	2	1.33%	12	8%	
		Fluoride	24	16%	6	4%	18	12%	13	8.66%	61	40.6%	
5		9040 ppm	14	9.33%	12	8%	8	5.33%	4	2.66%	38	25.33%	0.0771

	What is the amount of fluoride in SDF?	12,300 ppm	15	10%	14	9.33%	24	16%	9	6%	62	41.33%	
		44,800 ppm	22	14.66%	16	10.66%	9	6%	3	2%	50	33.33%	
6	SDF kills cariogenic bacteria in dental tubules.	True	35	23.33%	36	24%	39	26%	15	10%	125	83.3%	.00373*
		False	16	10.66%	6	4%	2	1.33%	1	0.66%	25	16.66%	
7	What is zombie effect in SDF?	If silver is reactivated, the dead bacteria will kill the living bacteria.	11	7.33%	12	8%	17	11.33%	11	7.33%	51	34%	.00412*
		If silver is reactivated, the dead bacteria will kill the healthy cells.	3	2%	1	0.66%	4	2.66%	2	1.33%	10	6.66%	
		Not aware	37	24.66%	29	19.33%	20	13.33%	3	2%	89	59.33%	
8	Does silver diamine fluoride stain teeth?	Yes	10	6.66%	21	14%	29	19.33%	9	6%	69	46%	.000185*
		No	8	5.33%	5	3.33%	2	1.33%	1	0.66%	15	10%	
		Maybe	34	22.66%	16	10.66%	10	6.66%	6	4%	66	44%	
9	If yes, is it permanent?	Yes	6	4%	16	10.66%	21	14%	8	5.33%	51	34%	.54365
		No	4	2.66%	5	3.33%	8	5.33%	1	0.66%	18	12%	
10	What are the disadvantages of SDF?	Avoided in patient with silver allergy	16	10.66%	13	8.66%	8	5.33%	1	0.66%	38	25.33%	.41964
		Can discolour tooth coloured fillings	1	0.66%	1	0.66%	3	2%	2	1.33%	7	4.66%	
		Temporarily discolors the soft tissue	2	1.33%	1	0.66%	1	0.66%	1	0.66%	5	3.33%	
		All the above	32	21.33%	27	18%	29	19.33%	12	8%	100	66.6%	
11	How often should SDF be applied?	Once in year	11	7.33%	4	2.33%	3	2%	1	0.66%	19	12.66%	.00187*
		Twice a year	9	6%	5	3.33%	16	10.66%	3	2%	33	22%	
		Depends on caries risk	31	20.66%	33	22%	22	14.66%	12	8%	98	65.33%	
12	Do you think SDF can be the best option for managing caries in pediatric patients with cognitive and /	Yes	47	31.33%	37	24.66%	33	22%	15	10%	132	88%	.3172
		No	4	2.66%	5	3.33%	8	5.33%	1	0.66%	18	12%	

	or physical impairments?												
13	Do you have any clinical experience using SDF?	Yes	12	8%	5	3.33%	3	2%	1	0.66%	21	14%	.0970
		No	39	26%	37	24.66%	38	25.33%	15	10%	129	86%	
14	Will you be using SDF as an option for treating pediatric patient in future practice?	Yes	47	31.33%	37	24.66%	33	22%	15	10%	132	88%	.3172
		No	4	2.66%	5	3.33%	8	5.33%	1	0.66%	18	12%	

*p<.05- Significant

Graph showing the overall knowledge score among the study population:

