



Curricular Practices on Chronic Disease Management and Minimally Invasive Dentistry among Post-Doctoral Pediatric Dentistry Residency Programs

Sandoval P, Arevalo O, Hui N, Chattopadhyay A

INTRODUCTION

Historically, ECC and caries was treated and managed with a surgical approach. Recently, a paradigm shift towards chronic disease management of ECC surfaced to combat dental caries in children by switching the thought process to a disease management approach versus the traditional surgical approach.

Chronic disease management (CDM) aims to incorporate a medical rather than a surgical approach when considering restorative dental treatment options for ECC. CDM is viewed as an intervention on a treatment spectrum between prevention and acute care. CDM considers dental caries as a life-long disease that can be managed with individual risk assessment, behavioral changes, and close collaboration between providers and patients.

Through implementation of accurate caries diagnosis, caries risk assessment and prevention, understanding a proper restorative threshold, and switching from a surgical perspective to a more chronic disease management approach, Minimally Invasive Dentistry (MID) is encouraging dentists to embrace a more cost-effective way of practicing dentistry.

As it stands, there is a gap in the literature with insufficient documentation on concepts being taught and implemented regarding MID and CDM in post-doctoral pediatric dentistry residency programs in North America. The aim of this study is to determine the topics within the domains of Chronic Disease Management and Minimally Invasive Dentistry that are being taught and incorporated in their clinical protocols, as well as to identify the barriers for incorporation.

METHODS

Review and approval for the study, categorized as exemption status, was obtained from the Research Institute of Nicklaus Children's Hospital, Miami, Fla., USA, and the Western Copernicus (Institutional Review Board), Puyallup, Wash., USA.

A 19-question online survey with the following domains: (1) program characteristics; (2) MID and CDM concepts taught in didactic versus clinical settings of pediatric dentistry residency programs; (3) time utilized by residents to discuss MID and CDM; and (4) perceptions of program directors for barriers to implementation of MID and CDM was electronically sent to all pediatric dentistry residency program directors in North America via Redcap.

RESULTS

Table 1: North American Pediatric Dentistry Residency Program Profile

	Overall N (%)	Hospital based (H) N (%)	University based (U) N (%)	Combined (C) N (%)	Other (O) N (%)
Age of Residency Program					
<5 years	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
5-10 years	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
11-20 years	6 (30)	1 (16.7)	2 (50)	1 (12.5)	2 (100)
21-30 years	2 (10)	2 (33.3)	0	0	0
>30 years	12 (60)	3 (50)	2 (50)	7 (87.5)	0
Faculty Distribution (mean)					
Full-time total	5.15	4.0	5.25	6.38	3.5
Full-time with board certification	4.3	3.83	3.75	5.25	3.0
Part-time total	6.7	3.5	5.75	10.5	3.0
Part-time with board certification	5.8	3.0	4.25	9.5	2.0

Table 3: Comparison of Programs Reporting CDM and MID Taught in Didactic vs Clinical:

	Didactic Portion					Clinical Portion				
	Overall (%)	(H) (%)	(U) (%)	(C) (%)	(O) (%)	Overall (%)	(H) (%)	(U) (%)	(C) (%)	(O) (%)
CDM	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)	19 (95)	6 (100)	3 (75)	8 (100)	2 (100)
MID	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)
Active Surveillance	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)	19 (95)	6 (100)	3 (75)	8 (100)	2 (100)
Nutritional Counseling	19 (95)	6 (100)	4 (100)	7 (87.5)	2 (100)	19 (95)	5 (83.3)	4 (100)	8 (100)	2 (100)
Caries Risk Assessment	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)	20 (100)	6 (100)	4 (100)	8 (100)	2 (100)
Motivational Interviewing	18 (90)	4 (66.7)	4 (100)	8 (100)	2 (100)	15 (75)	3 (50)	3 (75)	7 (87.5)	2 (100)
ICCMS	14 (70)	3 (50)	2 (50)	8 (100)	1 (50)	8 (40)	2 (33.3)	1 (25)	4 (50)	1 (50)
Teledentistry	12 (60)	4 (66.7)	2 (50)	5 (62.5)	1 (50)	13 (65)	3 (50)	2 (50)	7 (87.5)	1 (50)

Table 2: Time utilized in clinic per resident for discussion of CDM/MID

	Overall N (%)	Hospital Based (H) N (%)	University Based (U) N (%)	Combined (C) N (%)	Other (O) N (%)
Caries prevention and parent education on caries disease process per appointment					
1-5 minutes	8 (40)	2 (33.3)	2 (50)	3 (37.5)	1 (50)
6-10 minutes	12 (60)	4 (66.7)	2 (50)	5 (62.5)	1 (50)
11-15 minutes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
16+ minutes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Caries Risk Assessment (CRA) per appointment					
1-5 minutes	19 (95)	6 (100)	4 (100)	7 (87.5)	2 (100)
6-10 minutes	1 (5)	0 (0)	0 (0)	1 (12.5)	0 (0)
11-15 minutes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
16+ minutes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Diet and nutritional guidance per appointment					
1-5 minutes	15 (75)	4 (66.7)	4 (100)	6 (75)	1 (50)
6-10 minutes	4 (20)	2 (33.3)	0 (0)	2 (25)	0 (0)
11-15 minutes	1 (5)	0 (0)	0 (0)	0 (0)	1 (50)
16+ minutes	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

Table 4: Program Director's Reported Barriers to Implementation

	Overall N (%)	Hospital Based (H) N (%)	University Based (U) N (%)	Combined (C) N (%)	Other (O) N (%)
Concerns about parental acceptance:					
Disagree	13 (65)	3 (50)	2 (50)	7 (87.5)	1 (50)
Neutral	4 (20)	0 (0)	2 (50)	1 (12.5)	1 (50)
Agree	3 (15)	3 (50)	0 (0)	0 (0)	0 (0)
Concerns about off label use:					
Disagree	16 (80)	5 (83.3)	3 (75)	7 (87.5)	1 (50)
Neutral	3 (15)	1 (16.7)	0 (0)	1 (12.5)	1 (50)
Concerns about quality of evidence:					
Disagree	15 (75)	6 (100)	3 (75)	5 (62.5)	1 (50)
Neutral	1 (5)	0 (0)	0 (0)	1 (12.5)	0 (0)
Agree	4 (20)	0 (0)	1 (25)	2 (25)	1 (50)
Concerns about reimbursement/costs:					
Disagree	7 (35)	2 (33.3)	1 (25)	4 (50)	0 (0)
Neutral	4 (20)	1 (16.7)	2 (50)	0 (0)	1 (50)
Agree	9 (45)	3 (50)	1 (25)	4 (50)	1 (50)
Concerns about standardization among faculty:					
Disagree	5 (25)	2 (33.3)	2 (50)	1 (12.5)	0 (0)
Neutral	6 (30)	2 (33.3)	0 (0)	2 (25)	2 (100)
Agree	9 (45)	2 (33.3)	2 (50)	5 (62.5)	0 (0)
Faculty skepticism:					
Disagree	6 (30)	3 (50)	2 (50)	1 (12.5)	0 (0)
Neutral	4 (20)	1 (16.7)	0 (0)	1 (12.5)	2 (100)
Agree	10 (50)	2 (33.3)	2 (50)	6 (75)	0 (0)
Concerns about impact of patient flow:					
Disagree	9 (45)	2 (33.3)	1 (25)	5 (62.5)	1 (50)
Neutral	3 (15)	1 (16.7)	1 (25)	1 (12.5)	0 (0)
Agree	8 (40)	3 (50)	2 (50)	2 (25)	1 (50)
Program is understaffed:					
Disagree	7 (35)	1 (16.7)	1 (25)	4 (50)	1 (50)
Neutral	2 (10)	1 (16.7)	0 (0)	1 (12.5)	0 (0)
Agree	11 (55)	4 (66.7)	3 (75)	3 (37.5)	1 (50)

DISCUSSION

The results reveal several noteworthy findings. Despite all programs stating their use of Minimally Invasive Dentistry (MID) and Caries Disease Management (CDM) into both didactic and clinical protocols, there seems to be a disconnect as programs aren't uniformly utilizing concepts such as International Caries Classification Management System (ICCMS), Teledentistry or Motivational Interviewing which may lead to less invasive approaches, increased parental involvement and enhanced outcomes.

In terms of barriers, 45% of programs, particularly hospital-programs and other-combined-community-health-center programs, report reimbursement/costs as a significant barrier to implementation. This challenge is exacerbated by the fact that teaching programs have significant operational costs and serve mostly populations insured through the Medicaid program. The combination of these factors leads to programs running at a deficit and need for subsidization. Moreover, manpower shortage emerges as a nationwide concern, with 66.7% of hospital-based programs and 75% of university-based programs expressing worry about their programs being under-staffed. Program directors stressed concerns about lack of standardization and skepticism among faculty. These findings are concerning as these individuals are responsible for shaping the next generations of pediatric dentists.

These findings underscore the complexity of challenges faced by pediatric dentistry residency programs in North America, suggesting a need for targeted strategies and support to address these barriers effectively and support standardization in implementation of all concepts of MID/CDM to ensure comprehensive education and consistent patient care.

Further research and dialogue are needed to investigate and develop effective interventions and policies to identify and address these concerns.

