RESEARCH IN ORAL HEALTH

DENTAL HYGIENE RIOH PRESENTATIONS 2024

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Dental Hygiene Presentations Schedule

Room 3156	Time	Room 3157	Time
Artificial Intelligence in Dental Hygiene: A futuristic approach to lifelong smiles	6:00	Beyond the Bin: A deep dive into clinical waste	6:00
Matters of the Mouth and Mind: Impact of periodontitis on Alzheimer's Disease	6:30	Recognizing the Signs: A guide to Ectodermal Dysplasia for the oral health professional	6:30
The Dental Hygiene Care Spectrum: A clinician's toolbox for providing exceptional care for children with autism spectrum disorder.	7:00	Virtual Reality & Anxiety/Pain Management: Escape the pain, embrace the virtual gain.	7:00
Beyond the Bin: A deep dive into clinical waste	7:30	Artificial Intelligence in Dental Hygiene: A futuristic approach to lifelong smiles	7:30
Recognizing the Signs: A guide to Ectodermal Dysplasia for the oral health professional	8:00	Matters of the Mouth and Mind: Impact of periodontitis on Alzheimer's Disease	8:00
Virtual Reality & Anxiety/Pain Management: Escape the pain, embrace the virtual gain.	8:30	The Dental Hygiene Care Spectrum: A clinician's toolbox for providing exceptional care for children with autism spectrum disorder.	8:30

Artificial Intelligence in Dental Hygiene: A Futuristic Approach to Lifelong Smiles

Group Members: Corkum H, Frost M, MacDonald K, Porter R.
Advisor: Doucette H.

Background: Artificial intelligence (AI) in computer science allows computers to mimic human behaviors. Its application has expanded into multiple areas, including dentistry, where it has potential to significantly impact future practice such as enhancing the accuracy and efficiency of detecting dental caries, changes in the periodontium, and oral cancers.

Objective: This literature review aims to investigate AI's ability and involvement in preventative oral healthcare.

Methods: A search of available literature was conducted using PubMed, CINAHL, and Embase with the following keywords: artificial intelligence, dental hygiene, oral cancer, caries, periodontal disease, detection, and diagnosis. Inclusion criteria was: English language, peer-reviewed publications within the last ten years. Exclusion criteria was: editorials, non-peer-reviewed articles, and those not relevant to preventative care.

Results: Nine articles met the inclusion criteria, highlighting AI's involvement in caries detection, radiography, changes in the periodontium, and oral cancer detection.

Discussion: AI has shown the ability to assist in the diagnosis of caries, analysis of complex radiographs, early detection of oral cancer. However, AI technology has limitations including confidentiality, accountability, and data security concerns and should therefore be used in conjunction with clinical judgement, not as a replacement.

Conclusion: Incorporating AI into dental hygiene care may offer numerous benefits. As AI's role in oral healthcare grows, professionals should understand its benefits and limitations. By integrating the power of technology to analyze subtle cues and patterns, early intervention and improved oral health outcomes are within reach. More research is required on this topic.

“Beyond the Vin: A deep dive into clinical waste”

Group members –Al Smadi M, Patel P, Afifi L, Jacob A, Kukar A.
Advisor’s name – Wade A.

Objective: This review aims to identify components of oral health clinical waste, evaluate associated management challenges, and establish connections between the Four R's (Reduce, Reuse, Recycle, Rethink) and clinical waste management

Methods: Initially, Google Scholar, CDC, IPAC Canada, and WHO websites were utilized to obtain background information on the topic and to develop keywords. Then, a comprehensive electric data review of the literature was conducted to identify the most up-to-date information on oral health clinical waste using the following databases including PubMed and DOSS. All cited articles were published within the past 10 years.

Results: A total of 20 articles met the criteria; they consisted of: 2 systemic reviews, 3 scoping reviews, 1 survey study, 1 cross-sectional study, and 13 review articles.
The literature revealed that oral health offices should consider using the 4Rs (Reduce, Reuse, Recycle, and Rethink) while maintaining IPAC standards.

Discussion: Clinical waste reduction can be accomplished by reducing the use of plastic and other non-recyclable products, adopting digital radiology, partnering with recycling programs, and rethinking about adopting eco-friendly products and technologies.

Conclusion: More research is needed to understand and develop sustainable practices for managing clinical waste's impact on the ecosystem. Future studies should focus on finding alternative waste management strategies, evaluating current disposal methods' environmental impact, and exploring innovative technologies to reduce the ecological footprint.

Matters of the Mouth and Mind:
The Impact of Periodontitis on Alzheimer's Disease

Group Members: Morgan K, Pople K, Gallant M, Nguyen V, Watson J
Advisor: Hachey S.

Objective: This presentation analyzes the relationship between chronic periodontal inflammation and neurodegeneration in patients with Alzheimer's disease. It explores the possibility of periodontitis as a modifiable risk factor for the development of Alzheimer's disease by examining the presence and influence of periodontal pathogens in neuronal tissue.

Methods: A review of the literature was conducted by searching PubMed, EMBASE, and CINAHL, using keywords such as periodontal disease, periodontal pathogens, periodontitis, Alzheimer's disease, and dementia. The returns were screened using inclusion and exclusion criteria and the studies were critically appraised.

Results: A total of nine articles met the inclusion criteria. A significant theme that emerged was the presence of P. gingivalis in both the brains of mice and post-mortem Alzheimer's brains. Furthermore, several studies emphasized the role of systemic inflammation as a key mediator in the relationship between periodontal disease and neurodegeneration.

Discussion: Several mechanisms have been proposed which suggest how periodontal pathogens are affecting our brain. One of the probable mechanisms is the translocation of bacteria, and another being systemic inflammation. Current literature indicates that periodontal pathogens have been detected in the brains and cerebral spinal fluid of patients with Alzheimer's disease, suggesting that these pathogens can travel from the oral cavity into the bloodstream. Additionally, the literature found that when mice subjects were infected with P. gingivalis, they experienced an increase in neuroinflammation and amyloid plaque production, a widely suggested etiology of Alzheimer's disease.

Conclusion: With current literature revealing a potential link between periodontal pathogens and Alzheimer's disease, dental hygienists should aim to improve their knowledge surrounding this connection and implement this information into individualized patient care.

Recognizing the Signs:
A Guide to Ectodermal Dysplasia for the Oral Health Professional

Group Members: Richardson L, Miles, H, Allakany, A, Gabriel B, Haydar S.
Faculty Advisor: Professor Denise Zwicker

Background: Ectodermal Dysplasia (ED) are disorders that affect at least two structures derived from the ectoderm (skin, sweat glands, hair, teeth, and nails).

Objectives: This literature review aims to increase recognition of ED in oral health professionals by describing characteristics of ED; identifying treatment options and their outcomes; explaining how care of ED patients changes across the lifespan; and highlighting the importance of ED awareness to the dental hygiene process of care.

Methods: This literature review used PubMed and DOSS databases. Inclusion criteria were peer-reviewed, written in English, published within the last ten years, and included keywords werem developed with the aid of a dental librarian.

Results: Twenty-three articles met the criteria. Research themes included treatment modifications by age; clinical presentation; early treatment options; and preparation for surgical/non-surgical interventions.

Discussion: Ectodermal Dysplasia does not present the same for every patient, resulting in delayed diagnosis and treatment. Optimal oral health outcomes are achieved through early intervention and regular preventative dental care, much of which is encompassed within the dental hygiene scope of practice. Even with successful treatment, oral health care of patients with Ectodermal Dysplasia must be monitored closely due to changes that occur over the lifespan.

Conclusion: Oral health professionals play a key role in early diagnosis, treatment, and maintenance over these patients' lifetime, and are instrumental in ensuring optimal outcomes of treatment, and maintaining these results.

The Dental Hygiene Care Spectrum:
A clinician's toolbox for providing exceptional care for children with Autism Spectrum Disorder.

Group Members: Penney A, Thompson B, Bennett D, Buhler H, Coish S.
Advisor: Hare A.

Objective: This presentation's aim is to provide oral health professionals with accommodation solutions to address the oral health needs of children with autism spectrum disorder (ASD) and increase access to care.

Methods: A review was conducted by searching the following databases: PubMed, CINAHL, DOSS, Cochrane Library, and Google Scholar using the keywords 'oral hygiene,' 'dental anxiety,' 'autism spectrum disorder,' and 'children'. The inclusion specified articles written in English, published within the last 10 years, and peer-reviewed, while editorials and letters to editors were excluded.

Results: Eleven articles met the criteria covering accommodation solutions for reducing dental anxiety for children with ASD during oral hygiene appointments.

Discussion: The literature evaluated various interventions, including social stories, tell-show-do, and sensory modulation techniques, aimed at improving the dental hygiene experience for children with ASD. Findings suggest that these interventions, tailored to individual needs, hold promise in mitigating fear and anxiety, enhancing comprehension, and promoting preventative dental hygiene practices.

Conclusion: Integration of accommodation solutions in oral healthcare settings is crucial for children with ASD. Parents, educators, and oral health professionals should collaborate to increase access to care for these children.

Virtual Reality & Anxiety/Pain Management

Group Members: Brown M, Hebb K, Abokar F, Esse A, Olawunmi P.

Advisor: Kenwell L.

Objectives: This presentation aims to explore the fundamental concept of virtual reality (VR), its potential applications within the field of dental hygiene, and the specific challenges and considerations involved in integrating VR technology within oral health offices.

Methods: The methodology involved conducting a comprehensive literature review utilizing prominent databases, including PubMed and DOSS. Search results were screened based on predefined inclusion criteria, such as published in the last 15 years and peer-reviewed articles. Selected studies underwent critical appraisal to ensure rigor and relevance.

Results and Discussion: Nine articles were identified based on the inclusion criteria: 5 randomized controlled trials, 3 cross-sectional studies, and 1 narrative review, examined the use of virtual reality and anxiety/pain management. It was found that using VR during dental hygiene procedures such as debridement and local anesthesia administration, has shown improvement in patient comfort and a reduction in perceived pain and anxiety during these procedures. Challenges to using this technology include cost, patient compliance, and technical limitations.

Conclusion: The integration of virtual reality in oral healthcare can improve the patient's experience by reducing anxiety and enhancing comfort. Future research should prioritize developing cost-effective VR solutions, improving patient comfort, enhancing infection control measures, and overcoming technical challenges to fully utilize VR's potential in oral healthcare.