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Review article

Clinical holding as a behavior guidance technique in clinical pediatric dentistry: an integrative review

Contención clínica como técnica de manejo de conducta en odontología pediátrica: revisión integrativa

Contenção clínica como técnica de manejo do comportamento em odontologia pediátrica: revisão integrativa

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ABSTRACT

Introduction. The shaping, managing, and guiding of a child's behavior in the stressful context of a dental setting forms one of the pillars of clinical pediatric dentistry. When pharmacological methods are inaccessible, unavailable, and unaffordable, establishing a direct physical contact with the pediatric patient to counter their maladaptive behavior becomes imperative. The way a child should be held is called clinical holding. However, there exists no singular policy or guideline for dental practitioners on how children should be held in a controlled, comfortable, careful, legal, and appropriate manner. This article thus critically reviews the current literature and recommends a training regimen or protocol for clinical holding as applicable to pediatric dentistry. **Methodology.** A literature search was carried out across relevant databases, and studies were included for final data synthesis based on the research question framed by the SPIDER framework. **Results.** 16 articles were identified at the end of the literature search. They went through a realistic evaluation based on the Context-Mechanism-Outcome configuration. **Discussion.** Whetten's Model of Theory Development was then followed



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Author contributions

BS.

Conceptualization, methodology, software, formal analysis, investigation, data curation, writing – original draft.

AKP. Supervision, validation, resources, writing – review and editing, project administration, visualization.

to outline an evidence-backed theory by a phase-wise evaluation of the included studies. An outline for recommendations and a training regimen was then drawn to justify clinical holding in dentistry. **Conclusion.** This review recommends clinical holding as an approach to guiding a child's maladaptive behaviors in dentistry by developing a theory and framework of its use with recommendations for healthcare professionals.

Keywords:

Bioethics; Child Behavior; Psychology, Child; Evidence-Based Dentistry; Pediatric Dentistry; Restraint, Physical; Ergonomics; Pediatric, Nursing.

RESUMEN

Introducción. La modelación, gestión y orientación de la conducta del niño en el contexto estresante de la consulta odontológica constituye uno de los pilares de la odontología pediátrica. Cuando los métodos farmacológicos son inaccesibles, no están disponibles o no son asequibles, se vuelve imperativo establecer un contacto físico directo con el paciente pediátrico para contrarrestar conductas desadaptativas; a esta técnica se le denomina contención clínica (clinical holding). Sin embargo, no existe una política ni una guía única para los profesionales de la odontología sobre cómo sujetar a los niños de manera controlada, cómoda, cuidadosa, legal y apropiada. El objetivo de este artículo es revisar críticamente la literatura disponible y proponer un programa de formación o un protocolo de contención clínica aplicable a la odontología pediátrica. **Metodología.** Se realizó una búsqueda bibliográfica en bases de datos relevantes y se incluyeron estudios para la síntesis final de datos con base en una pregunta de investigación formulada mediante el marco SPIDER. **Resultados.** Se identificaron dieciséis artículos al finalizar la búsqueda

bibliográfica. Estos fueron sometidos a una evaluación realista basada en la configuración Contexto–Mecanismo–Resultado. **Discusión.** Se aplicó el Modelo de Desarrollo de Teoría de Whetten para delinear una teoría sustentada en la evidencia mediante una evaluación por etapas de los estudios incluidos. A partir de ello se elaboró un esquema de recomendaciones y un programa de entrenamiento para respaldar el uso de la contención clínica en odontología. **Conclusiones.** Esta revisión respalda la contención clínica como una estrategia de manejo de conducta en odontología pediátrica y presenta un marco teórico con recomendaciones para los profesionales de la salud sobre su uso adecuado.

Palabras clave:

Bioética; Conducta Infantil; Psicología Infantil; Odontología Basada en la Evidencia; Odontología Pediátrica; Restricción Física; Ergonomía; Enfermería Pediátrica

RESUMO

Introdução. A modelagem, gestão e orientação do comportamento da criança no contexto estressante da consulta odontológica constituem um dos pilares da odontologia pediátrica. Quando os métodos farmacológicos são inacessíveis, indisponíveis ou não viáveis, torna-se imperativo estabelecer contato físico direto com o paciente pediátrico para neutralizar comportamentos desadaptativos; essa técnica é denominada contenção clínica (*clinical holding*). No entanto, não existe uma política ou diretriz única para orientar profissionais de odontologia sobre como segurar as crianças de maneira controlada, confortável, cuidadosa, legal e adequada. O objetivo deste artigo é revisar criticamente a literatura disponível e propor um programa de formação ou um protocolo de contenção clínica aplicável à odontologia pediátrica. **Metodologia.** Foi realizada uma pesquisa bibliográfica em bases de dados relevantes e foram incluídos estudos para a síntese final dos dados com base em uma pergunta de pesquisa formulada através do método SPIDER. **Resultados.** Foram identificados dezesseis artigos ao final da pesquisa bibliográfica. Estes foram submetidos a uma avaliação realista com base na configuração Contexto–Mecanismo–Resultado. **Discussão.** O Modelo de Desenvolvimento de Teoria de Whetten foi aplicado para delinear uma teoria baseada em evidências por meio de uma avaliação em etapas dos estudos incluídos. A partir disso, foi elaborado um esquema de recomendações e um programa de treinamento para apoiar o uso da contenção clínica em odontologia. **Conclusões.** Esta revisão respalda a contenção clínica como estratégia de manejo do comportamento em odontologia pediátrica e apresenta um marco teórico com recomendações para profissionais de saúde sobre seu uso adequado.

Palavras-chave:

Bioética; Comportamento Infantil; Psicologia da Criança; Odontologia Baseada em Evidências; Odontopediatria; Restrição Física; Ergonomia; Enfermagem Pediátrica

Introduction

The field of pediatric dentistry (PD) lays special emphasis on behavior guidance and child psychology to ascertain successful treatment outcomes while simultaneously instilling a positive dental attitude. The amalgamation of PD and child psychology directly corresponds to the psychodynamic state of the child’s mind. This psychological state can be tamed through pharmacological and non-pharmacological means. Techniques included in the former category are preferred less when sedation services are inaccessible, unaffordable, and unacceptable (1–3). In such cases, the application of non-pharmacological techniques comes into the picture.

The display of maladaptive behaviors (hyperactivity, adverse to authority, hysterical, rebellious, defiant) by pediatric patients after the employment of less invasive non-pharmacological techniques makes it imperative for the dental surgeon to establish direct physical contact with the patient. Depending on the cognitive and emotional developmental state of the pediatric patient, how the child is held can have significant clinical implications over some time. Three prominent papers published since 2020 on this subject have revealed that dental practitioners often find

restraining a child to evoke negative emotions, create ethical dilemmas, and raise psychological feelings of professional failure (1,4,5).

Clinical Holding (CH) is a concept widely used in the field of nursing and is defined as positioning a child so that a medical procedure can be carried out in a safe and controlled manner, wherever possible with the consent of the child and parent/carer (6). The application of CH in dentistry is defined as the use of physical holds to assist or support a patient to receive dental care or treatment in situations where their behavior may limit the ability of the dental team to effectively deliver treatment, or where the patient’s behavior may present a safety risk to themselves, members of the dental team or other accompanying persons (7).

CH in dentistry contributes to the understanding of behavioral science in the context of a dental setting with the help of CH as a type of behavioral medicine. Child psychology, PD, nursing, psychodynamics, cognitive behavior therapy, and behavior medicine are key components of CH. The multifaceted & interdisciplinary nature of this non-pharmacological physical intervention makes it an approach that should be approached with caution (Figure 1).

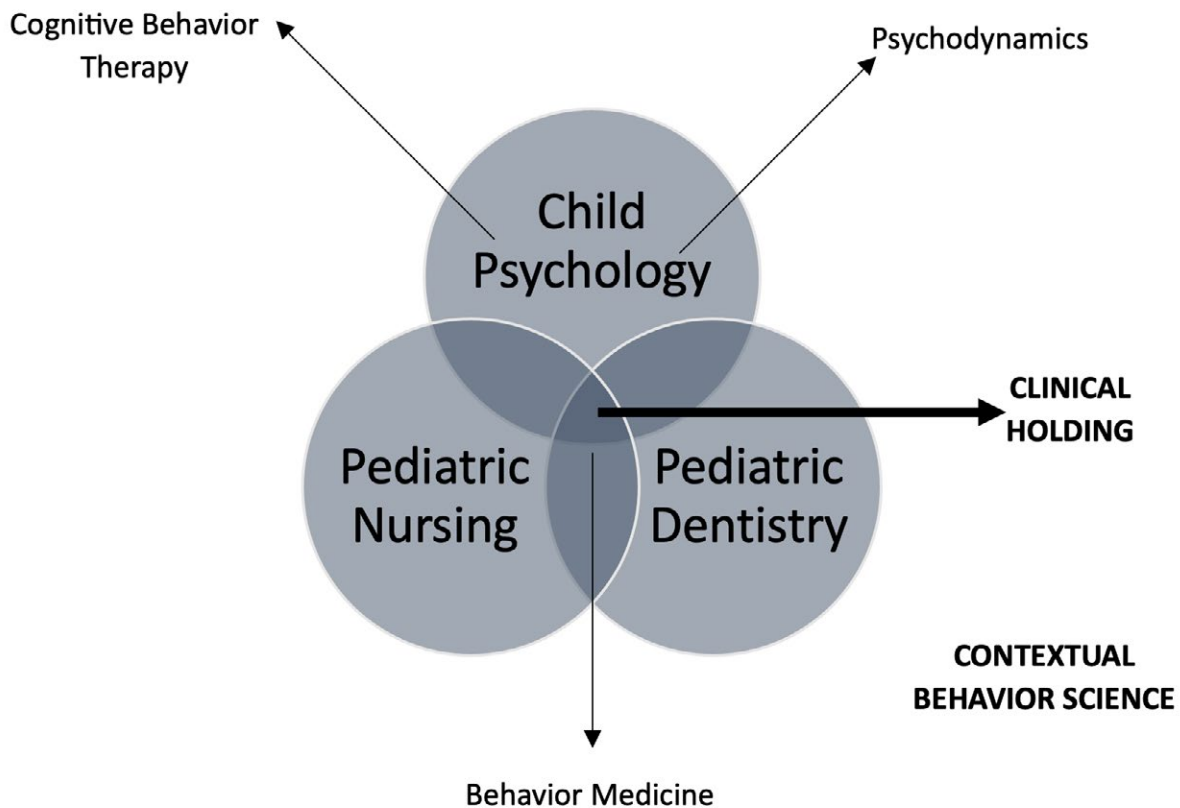


Figure 1: The multi-faceted nature of clinical holding
Source: prepared by the author

Since CH is a restrictive intervention, it can infringe on the patient's human rights and freedom of movement. Thus, it should be performed in a manner in which Article 12 and Article 24 of the United Nations Convention on the Rights of the Child (UNCROC) are not violated (8,9).

CH has been used interchangeably with supportive holding, therapeutic holding, restraint, physical restriction, immobilization, comfort positioning, comfort holding, and secure cuddling (10). The lack of consistency between these terms is a matter of concern to understand these holding techniques (11).

Restraint is the positive application of force to overpower the child without assent. Restraints can be physical (direct contact), mechanical (stabilization equipment or devices), chemical (medications), environmental (buildings or rooms designed to restrict movement), or psychological (depriving the patient of his/her lifestyle choices). Restrictive Physical Intervention (RPI) is described as any method that involves some degree of direct force to restrict movement. 'Containing' was initially used to describe a form of physical barrier that prevents the patient from leaving, harming themselves, or causing serious property damage. However, containing and restraint are no longer separate terminologies and are now grouped under RPIs (12).

Restriction of a patient's freedom of movement, with or without the patient's permission is called protective stabilization. It is listed as an advanced behavior guidance technique by the American Academy of Pediatric Dentistry (AAPD). It can be performed by the dentist, staff, or parent (active restraint), with the help of a stabilization device (passive restraint), or as a combination of both. Passive restraint utilizes mouth props and papoose boards. However, as papoose boards are placed around the chest, they pose a serious threat to the patient's respiration cycles and to patients who are about to receive medications (13). Furthermore, the AAPD's Handbook of Pediatric Dentistry used to formerly (4th edition) use the term 'Hold and Go' as an advanced behavior management technique which requires consent. However, in its description, it stated that this technique does not have a formal definition and is yet commonly performed (14). The term 'Hold and Go' was thus eliminated from the subsequent edition, and as per its latest edition (6th), sedation, and protective stabilization are the only recommended behavior management techniques (15).

Escorting is a light grasp with which the patient or a part of the patient's body is moved to the desired location. If a patient is unable to let go of this grasp, it is considered a manual restraint (16).

CH differs from restraint, RPI, protective stabilization, and escorting by the degree of force used, the intention of the hold, and the agreement of the child. There are three degrees of force corresponding to the holding technique used. The first degree of force is minimal with the child consenting to perform the clinical hold. The second degree of force may or may not require the child's consent. At this stage, ceasing the treatment and the clinical hold would not be in the best interest of the child. The third degree of force represents restraint (17–19).

How a child is held can often be forceful or punitive. Thus, an inclination arises to address the need for clinical "holds" that can alleviate the need for restraint in pediatric patients (20). This paper narrates a critical review of the literature on CH as applicable to PD and further presents clinical recommendations based on Whetten's Model of Theory Development (21).

Methodology

The protocol of this scoping review was registered on Open Science Framework (<https://doi.org/10.17605/OSF.IO/TV3ZN>). This manuscript is reported as per the PRISMA-ScR guidelines. The reporting of this manuscript was done as per the guidelines by Goris SJAG. (22). The formulation of the research question along with the inclusion and exclusion criteria was done by the SPIDER tool (Table 1) (23).

A thorough literature search was performed across the following databases: PubMed, PubMed Central, Scopus, Cochrane Library, MedNar, ScienceDirect, and Google Scholar. The keywords used were "clinical hold", "therapeutic hold", "supportive hold", "comfort position", "comfort hold", "secure cuddling", and "pediatric dentistry". Necessary Boolean operators and truncation symbols were used to refine the search. The limits used in the search strategy were time (till 2021), language (English), species (humans), and age (birth to 12 years; children/pediatric).

All studies that mention the use of CH in PD or nursing for behavior guidance were included in this study. The types of studies included were clinical practice guidelines, review articles, position/theoretical papers, policies, and recommendations. The following data was charted to make the synthesis suitable for a realist evaluation. The following data was extracted: Publication year, First author, Study design, Context for the use of CH, Technique of CH used, Outcome after the use of CH.

Table 1. SPIDER framework for the formulation of research question

RESEARCH QUESTION	INCLUSION CRITERIA	EXCLUSION CRITERIA
Sample	Pediatric patients in dental and nursing settings	Pediatric patients managed by pharmacological techniques or other non-pharmacological interventions
Phenomena of Interest	Clinical Holding (or any synonymous term) used as a behavior guidance technique	i) Pediatric patients not indicated for any physical interventions for behavior guidance ii) Articles where “clinical hold” refers to the suspension or delay of an ongoing clinical investigation.
Design	Clinical Practice Guidelines, Review Articles, Position/Theoretical Papers, Policies, Published Recommendations	Observational studies
Evaluation	Context, Mechanism & Outcomes (CMO) Configuration	-
Research Type	Qualitative	-

Source: prepared by the author

Studies included in the final synthesis were done in three phases: identification of the study type, screening of abstracts, and full-text review. Manual additions through expert advice and cross-referencing were added

retrospectively and duplicates were removed using a web-based tool for reviews (Rayyan). A total of 33 articles were identified out of which 16 were included for final evidence synthesis (Table 2).

Table 2. Included articles with realist evaluation

YEAR & AUTHOR	TYPE OF PAPER	REALIST EVALUATION (CMO CONFIGURATION)		
		CONTEXT	MECHANISM	OUTCOME
1997 Stirling et al. (42)	Theoretical Framework	Violence in people with learning disabilities healthcare settings	Clinical Audit	Non-aversive natural therapeutic holding was quick and preferred by the staff
1998 Stirling et al. (40)	Case Study	Violence in people with learning disabilities healthcare settings	Case Study	Non-aversive natural therapeutic holding is a safe and ethical procedure and allows the patient to cope better.
2002 Peretz et al. (35)	Clinical Guidelines	Demographic & Cultural Factors influencing dentists’ use of restraint	Critical Review	Practice Location, Educational Level of Dentists and Parents play a key role in the selection of restraint strategies
2003 Lambrenos et al. (6)	Policy	Guidelines, Training, Implementation & Piloting of CH	Policy Drafting	Decision-making process in CH
2009 Nunn et al (7)	Policy	CH Skills for Dental Services	Policy Drafting	Professional Framework for the use of CH in dental services
2009 Romer (29)	Critical Review	Consent and immobilization in dental patients with developmental disabilities	Review of Existing Guidelines	Informed consent and use of restraint should be incorporated in overall guidelines for selection of behavior management techniques
2011 Duff et al (18)	Clinical Guidelines	Managing distressing procedures in children	Pediatric Psychology Network Guidelines	Preparing, Positioning, Coping, Reacting and Training approaches for managing pediatric psychological distress
2013 Kerr et al (3)	Policy Review	CH in Special Care Dentistry	Clinical Audit	CH was effective in reducing the need of general anesthesia
2014 NHS Grampian	Clinical Guidelines	Use of Physical Interventions	Policy Drafting	Staff training, Risks and Documentation of Physical Interventions
2016 Allen et al (27)	Policy	CH in Dental Care of Children	Policy Drafting	Clinical Guidelines on CH in PD
2016 Kennedy & Binns (45)	Policy	Therapeutic Safe Holding in Hospital	Policy Drafting	Rationale, Training and Further implications of Practice for therapeutic safe holding

2019 RCN (12)	Clinical Guidelines	RPIs and CH of young people	Policy Drafting	CH guidelines for children receiving healthcare interventions
2019 Page (44)	Clinical Guidelines	Ethical CH for Nurses in United Kingdom	Case Studies	Ethical Framework proposed for clinical holds at different levels of value-based interventions in different situations
2020 AAPD (13)	Clinical Guidelines	Behavior Guidance techniques in PD	Expert and consensus review	Protective Stabilization is an advanced behavior guidance technique
2020 Costa et al (39)	Critical Review	Curriculum for managing dentally anxious children	Survey and modified Delphi	Need for the dental curricula to be customized to solve misconceptions about behavior management practices among pediatric oral healthcare practitioners
2021 Hollins et al (43)	Evaluation Framework	Common restraint techniques by expert practitioners	Survey	Physical holds commonly taught by practitioners

CH: Clinical Holding; PD: Pediatric Dentistry

Source: prepared by the author

Appraisal of the included studies was done by two independent reviewers (BS, AP) using the sum-score decision rule to ensure face and content validity. If a conflict arose, two external experts (one in the field of PD, and one in the field of nursing) were consulted to

decide through consensus regarding the inclusion of the article. A total of 33 articles were identified out of which 16 were included for final evidence synthesis. A PRISMA Flow diagram can be referred to understand the process behind the identification of the studies (Figure 2).

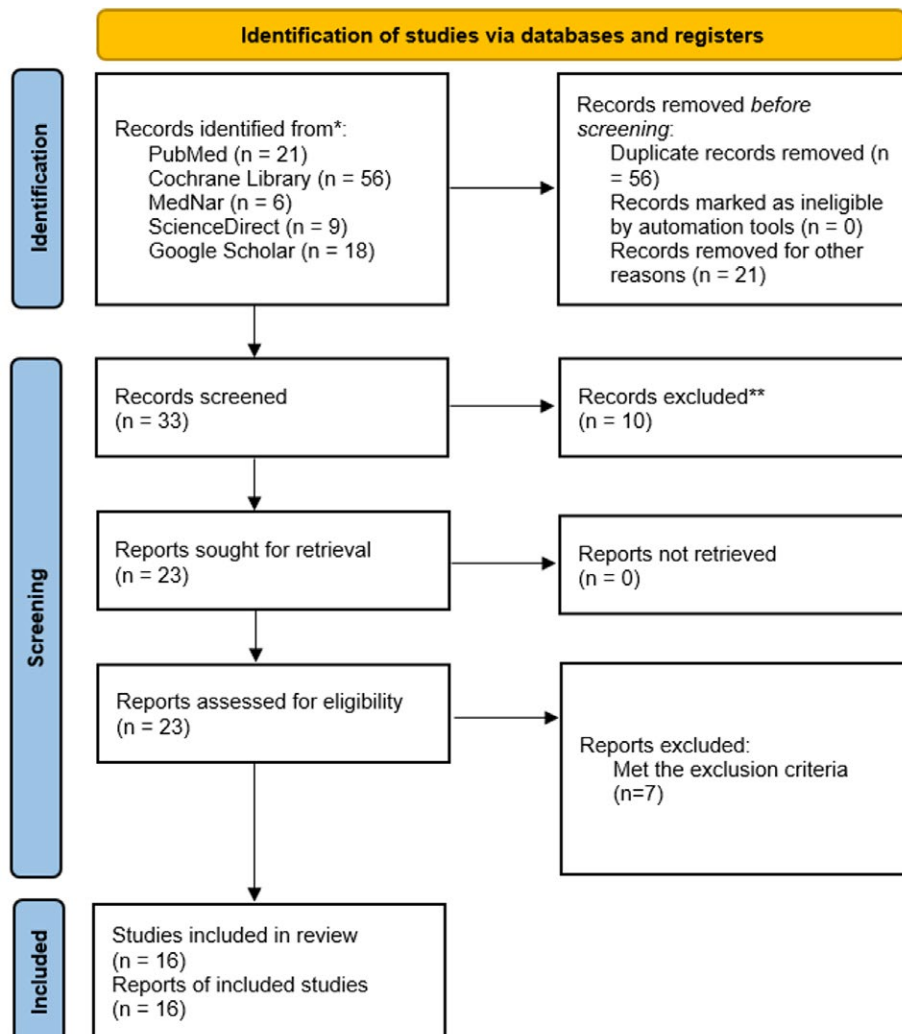


Figure 2: PRISMA Flow Diagram
Source: prepared by the author

To construct a theoretical model of CH as applicable to PD, Whetten's Model of Theory Development was followed. This model comprises four questions: What are the constructs and concepts? (Phase I), How are the various factors involved related to each other? (Phase II), Why and which factors justify the proposed relationships between the factors? (Phase III), Who, where, and when - implications for practice (Phase IV).

Results

All the included studies were published between 1997 to 2021. Each source of evidence chosen for the literature search was a prominent database that housed biomedical research works. The context, setting, or the focus sample for CH in the included studies were children with disabilities (n = 3), dentists (n = 5), general hospital setting (n = 4), and training and guideline development programs (n = 4). Each included study was scored either 4 (representative) or 5 (completely representative) as per the sum score-decision rule during critical appraisal by the two independent reviewers (Supplementary File 1). The distribution of the 16 included papers was as follows: 1 theoretical framework, 2 case studies, 1 evaluation framework, 1 policy review, 2 critical reviews, 6 clinical guidelines, and 4 policy drafts (Table 2).

A realist evaluation of the included studies was done based on the context-mechanism-outcome (CMO) configuration to justify their relevance to this study (24).

Discussion

Despite being a technique that finds its roots in the field of nursing, clinical or therapeutic holding of patients based on Grounded theory appears to have a significant theory-practice gap. In the field of PD, where the holding of a child during treatment can become imperative in some cases, there is a complete absence of CH in its curricula. Dentists prefer CH as the most favorable advanced behavior management technique. However, there is a paucity of guidelines to adhere to (10,25). Based on this research gap, the authors propose a standardized protocol for holding children in dentistry backed by Whetten's model.

Phase I – What are the constructs and concepts?

A total of thirteen constructs were identified following a full-text review of the included studies.

The first construct addresses the ethical principle of beneficence which means that CH must be done in the best interest of the patient (26). The second construct suggests that CH should be opted for only after the dismissal of less restrictive options (12). The principle of non-maleficence is identified as the third construct, according to which CH should be done to prevent any harm coming to the individual. The fourth construct emphasises that healthcare providers must stick to published guidelines

while performing CH (44). Governance of risks, including avoiding airway obstruction, aspiration, pressure injuries, soft tissue injuries, articular/bony injuries, psychological harm/distress, urinary incompetence, obesity, heart disease, general ill health, and exhaustion of the patient makes the fifth construct of CH (28).

Involvement of parents and staff in the CH of the patient are the sixth and seventh constructs respectively. The eighth construct recommends that staff members must be appropriately trained in the CH of the pediatric patient (45). They must also be aware of the alternatives to restraint, holding, and containing children. According to the ninth construct, since CH is done in the best interest of the patient, children can consent, but not refuse the procedure (7). The tenth construct further explains that CH is primarily done to reduce the patient's distress or non-compliance, and not as a form of punishment (29).

The eleventh construct chronicles how pre-emptive action whenever possible must be employed. Physical interventions can be of two types: planned and unplanned. Planned physical interventions should take into consideration environmental factors and behavior management techniques whose goal must be to prevent the use of CH. Seclusion and de-escalation techniques should be advocated before opting for CH. Unplanned physical restrictions involve sharp decision-making during the situation and require a team that knows the proper techniques of restraint and is within acceptable levels. These emergencies can involve the child trying to break away or disengage from dangerous or harmful contact, or when the patient is under threat of a dangerous situation (injury due to dental equipment or instrument) (7,30).

The twelfth construct characterizes the duration of CH. There are no standard guidelines suggesting how long a child should be physically restrained. However, a historical review article suggests that physical restraints must not last longer than 1 hour for a patient younger than 10 years of age, 2 hours for a patient between 10 to 18 years of age, and 4 hours for patients older than 18 years (31). These durations are far-fetched for dental procedures and hence, it is best advised that the total duration of child holding must be decided by considering the age of the child, level of agitation, clinical procedure to be carried out, parent's opinion, and child and staff safety.

Finally, the thirteenth construct focuses on the monitoring of the patient after CH. CH should not terminate abruptly. After the required clinical procedure is carried out, the patient is closely monitored for any change in the physical condition of the patient which needs attention. Patients should be given a chance to review their experience of physical restraint with the involvement of the operating dentist, parents, and staff. Every effort must be made towards reducing the potential negative impact that can have on the patient's mind following CH (7).

Phase II – How are the various factors involved related to each other?

If the identified constructs in Phase I are to be implemented, then it becomes necessary to establish the patient-related factors that directly influence CH in the dental setting. Five themes were identified based on patient assessment: appointment schedule, medication history, dental environment, communication, triggers for behavior change, and augmentative techniques.

The child's best behavior can be expected after knowing about his or her daily routine beforehand. This can be done by the pediatric dentist during anamnesis. A history of medications can help in understanding if the drug contributes to delirium, confusion, and movement disorders for the child. Lighting, temperature, dental chair comfort, clinical area ambiance, and noise level need to be consistent all the time to keep the patient's behavior as predictable as possible (27,32).

The first goal of behavior guidance is to establish communication (13). The presence of physiological factors like dementia, depression, anxiety, agitation, fear, grief, post-traumatic stress, substance abuse, and different primary language may create a communication gap.

Parents and guardians must be asked about the behavioral history of the patient, and they can learn about factors that can trigger an unsafe behavior change in the patient. Coburn and Mycyk have stated the need to recognize the three phases of violence to initiate de-escalation strategies (33). These are anxiety (Phase 1), defensiveness (Phase 2), and physical aggression (Phase 3). Phase 1 and Phase 2 must be dealt with by establishing communication, rapport, and seclusion. If voice control is ineffective in controlling Phase 3, physical or chemical restraints are warranted.

CH works best when combined with other behavior guidance techniques. These augmentative techniques

include music therapy, relaxation techniques, embedded commands, acclimatization, and consistency (34).

Phase III – Why and which factors justify the proposed relationships between the factors?

To justify CH in PD, it is important to rule out other behavior guidance techniques. Usually, when non-pharmacological methods fail to achieve any success in managing a child's behavior, pharmacological options are opted for. However, there are instances where pharmacological means cannot be vouched for. Poor access to sedation services, unaffordability of these services by patients of low socioeconomic status, and lack of acceptance of pharmacological interventions in patients with cognitive impairments are some common scenarios where physical intervention is preferred over pharmacological means. Even if the child's treatment can be completed through general anesthesia, parents may not be patient enough to wait till the procedure is scheduled and might not be compliant with the child's endurance of pain. In such cases, an ethical dilemma arises, making it mandatory for the healthcare provider to caution the parents about the psychological distress that the child may experience in case de-escalation strategies fail (1–3,35).

CH has been used more often in hospitals and its use in PD has been under-reported. Professionals involved in holding and restraining procedures have reported negative and psychological factors that can affect the service provider. Factors that can very well be detrimental for the dental staff members who are involved in CH of a pediatric patient include moral distress, compassion fatigue followed by post-traumatic stress disorder, anxiety-provoking experience, re-traumatization, demeaning experience, anger and abuse in response to patient's behavior and sense of dread (25,28,36,37).

The healthcare profession must also be well-versed in the scenarios wherein CH must be discontinued (Table 3).

Table 3. Scenarios where Clinical Holding must be discontinued

Patient withdraws consent, unless: <ul style="list-style-type: none"> • CH has been decided upon and the patient cannot make any decision • It is an emergency and safeguarding the patient or others from serious harm is necessary
Psychological distress/anxiety
Pain or discomfort during a particular hold
Shown signs of circulatory compromise
Vomited during the hold
An episode of seizure or convulsion
Construed a direct contact as indecent or one that arouses sexual feelings or expectations or re-traumatizes a child or a young patient

CH: Clinical Holding

Source: prepared by the author

Phase IV – Who, Where, and When - Implications for Practice

CH in PD requires extensive and long-term studies to distinguish it from the more severe forms of physically restrictive interventions. Quality Improvement (QI) programs/projects can be done which can help in educating dentists about the indications, contraindications, and training regime for CH.

Need for training

Failure to anticipate the emotional and physical harm that may arise through physical interventions can result in allegations of battery and abuse. To ensure effective treatment and prevention of post-procedural psychological, it is necessary to have a team of trained people holding the patient still (36).

The need for restraining children arises as a response to problematic behavior and when it is required for the child to stay still during clinical procedures. Nurses and healthcare professionals have expressed their concerns wherein they are faced with the dilemma of either applying restraints or allowing patients' freedom of movement (32). It is also a matter of concern that ethical approval from parents or the assent of the children is not taken into consideration by doctors who resort to CH.

Peretz et al. (35) report that the long-term psychological impact that can have on the child's mind is a major reason why directors of advanced pediatric educational programs have reservations about the use of restraints. The authors further state there is an ample amount of literature describing the short-term success of the use of restraints, but there is almost no literature describing the long-term psychological impact on the patients (35).

Collier et al. (38) identified only two methods of restraining children during clinical procedures: (a) hand-over-mouth restraint during dental procedures and (b) restrain methods for physically aggressive children in psychiatric settings. The authors' landmark survey of 394 pediatric nurses revealed the need of developing guidelines on how and when to hold a child still in medical procedures (38).

The ones who are trained in RPIs themselves have raised particular doubts about joint locks and flexion to trigger pain. Moreover, trained staff members may often resort to physical interventions straight away without applying de-escalation techniques, which is more likely to elicit an aggressive response (37).

Recommended training regime

There is a need to develop safe, systematic, standardized, and culturally appropriate restraint techniques for health settings in developing countries (16,39). The salient features of a CH training program can be taught by keeping

the modules following the CALM (Crisis, Aggression, Limitation, and Management) protocol or by breaking it down stage-wise (confrontation, rejection, de-escalation, resolution, and exploration) (6,40).

- All professionals must be educated about positive behavioral support, information provision, preparation, distraction, de-escalation, and the appropriate use of local anesthetics and oral analgesics (12).
- It should be repeatedly emphasized that CH should only be used as a last resort (12).
- The teacher should be able to accurately demonstrate holding and restraining techniques (37).
- Since CH is based on the context of a dental setting, it is important to learn how to establish a safe "holding environment" for the child (34).
- Complex techniques involving a partner can only be skilfully retained through frequent repetitions of performing the technique (37).
- Control and Restraint, and Safe Breakaways are some of the common techniques used. While the former is aimed at the immobilization of the patient, the latter trains the healthcare provider in escaping, disengaging, and defencing safely against the violent attacks of the patient (37).
- Control and Restraint can be done through passive holds (basket holds, stabilizing hold, seated hold, floor hold, repositioning hold), low-level single-person restraint to three-man team restraints, and wrist and arm locks. The clinical holds should be such that they avoid pressure against joints, breathing restrictions, and pain in children (6,30,34,37,41,42).
- Training in Supine Holds and Shoulder Hugs for medical procedures on face, head, mouth, ear, and nose procedures can be effectively applied in PD (41).
- The concept of 'gradient of control' must be used, wherein the nature of a specific hold applied should be proportionate to the action or behavior of the patient (7).
- Healthcare professionals trained in CH should only be involved. The role of parents who are willing to help must be restricted to simply supporting the patient (e.g., holding by the hand) (7).

- CH techniques can have high variations and differentiations across populations and clinical settings. A training program aimed at a particular clinical setting must be confined to a pre-existing framework that can constitute good holding and restraining techniques (43). To the authors' best knowledge, there is no such particular framework, guidelines, or protocol addressing CH in PD.
- A refresher course of at least one day every 12 months is needed for the trained professionals (7).
- Trained professionals must be taught about proper record-keeping in situations where CH is needed (7).

Conclusions

CH in PD is an unexplored topic that has no reliable document to bank upon. The techniques of CH are questionable in dental practice because of the lack of evidence on its frequency of use and documentation that explains why it was opted for in the first place. Future research on CH in PD should take a step further from this paper, by explaining more practical approaches to the topic.

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Conflict of interest

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Ethical responsibilities

Protection of people: This study is considered risk-free due to its nature. It was approved by the Institutional Ethics Committee.

Confidentiality of data: The authors declare they have followed their work center's protocols on the publication of patient data.

Right to privacy and informed consent: The authors have obtained the informed consent of patients and/or subjects mentioned in the article. This document is in the possession of the corresponding author referred to in the article.

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