كليـــــــة الـطب
والصيدلة - مراكش
FACULTÉ DE MÉDECINE
ET DE PHARMACIE - MARRAKECH
MARRAKECH
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UNIVERSITÉ CADI AYYAD

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PARENTAL PRESENCE AND PAIN PERCEPTION IN THE CHILD

THESIS

PRESENTED AND PUBLICLY DEFENDED ON THE 13/11/2024

BY

Ms. Oumaima NOUHAIL

Born on the 04/10/1999 in El Youssoufia

TO OBTAIN THE DEGREE OF DOCTOR OF MEDICINE

KEY WORDS

Pain – Children– Parents

JURY

Mr.	S.YOUNOUS Professor of Anesthesiology and Critical care medicine	Chairperson
Mrs.	I.AIT SAB Professor of Pediatrics	Advisor
Mr.	M.BOURROUS Professor of Pediatrics	Judges
Mrs.	H.NASSIH Professor of Pediatrics	

{رَبِّ أَوْزِعْنِي أَنْ أَشْكُرَ نِعْمَتَكَ
الَّتِي أَنْعَمْتَ عَلَيَّ وَعَلَى وَالِدَيَّ
وَأَنْ أَعْمَلَ صَالِحًا تَرْضَاهُ وَأَصْلِحْ
لِي فِي ذُرِّيَّتِي إِنِّي تُبْتُ إِلَيْكَ
وَإِنِّي مِنَ الْمُسْلِمِينَ}

سورة النمل الآية : 19

بِسْمِ ٱللَّهِ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ

قَالُوا۟ سُبْحَٰنَكَ لَا عِلْمَ لَنَآ إِلَّا مَا عَلَّمْتَنَآ ۖ إِنَّكَ أَنتَ ٱلْعَلِيمُ ٱلْحَكِيمُ ﴿٣٢﴾

صَدَقَ ٱللَّهُ ٱلْعَظِيمُ

سورة البقرة ٢:٣٢

Serment d'Hippocrate

***A**u moment d'être admis à devenir membre de la profession médicale, je m'engage solennellement à consacrer ma vie au service de l'humanité.*

***J**e traiterai mes maîtres avec le respect et la reconnaissance qui leur sont dus.*

***J**e pratiquerai ma profession avec conscience et dignité. La santé de mes malades sera mon premier but.*

***J**e ne trahirai pas les secrets qui me seront confiés.*

***J**e maintiendrai par tous les moyens en mon pouvoir l'honneur et les nobles traditions de la profession médicale.*

***L**es médecins seront mes frères.*

***A**ucune considération de religion, de nationalité, de race, aucune Considération politique et sociale, ne s'interposera entre mon devoir et mon patient.*

***J**e maintiendrai strictement le respect de la vie humaine dès sa conception.*

***M**ême sous la menace, je n'userai pas mes connaissances médicales d'une façon contraire aux lois de l'humanité.*

***J**e m'y engage librement et sur mon honneur.*

Déclaration Genève, 1948

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FACULTE DE MEDECINE ET DE PHARMACIE

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274	BOUZID Fatima zahrae	Pr Ass	Génétique

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280	NASSIRI Mohamed	Pr Ass	Traumato-orthopédie
281	AIT-DRISS Wiam	Pr Ass	Maladies infectieuses
282	AIT YAHYA Abdelkarim	Pr Ass	Cardiologie
283	DIANI Abdelwahed	Pr Ass	Radiologie
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288	BENNIS Lamiae	Pr Ass	Anesthésie-réanimation
289	BENDAOUD Layla	Pr Ass	Dermatologie
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294	YOUSFI Jaouad	Pr Ass	Gériatrie
295	NACIR Oussama	Pr Ass	Gastro-entérologie
296	BABACHEIKH Safia	Pr Ass	Gynécologie-obstétrique
297	ABDOURAFIQ Hasna	Pr Ass	Anatomie
298	TAMOUR Hicham	Pr Ass	Anatomie
299	IRAQI HOUSSAINI Kawtar	Pr Ass	Gynécologie-obstétrique
300	EL FAHIRI Fatima Zahrae	Pr Ass	Psychiatrie
301	BOUKIND Samira	Pr Ass	Anatomie

302	LOUKHNATI Mehdi	Pr Ass	Hématologie clinique
303	ZAHROU Farid	Pr Ass	Neurochirugie
304	MAAROUFI Fathillah Elkarim	Pr Ass	Chirurgie générale
305	EL MOUSSAOUI Soufiane	Pr Ass	Pédiatrie
306	BARKICHE Samir	Pr Ass	Radiothérapie
307	ABI EL AALA Khalid	Pr Ass	Pédiatrie
308	AFANI Leila	Pr Ass	Oncologie médicale
309	EL MOULOUA Ahmed	Pr Ass	Chirurgie pédiatrique
310	LAGRINE Mariam	Pr Ass	Pédiatrie
311	OULGHOUL Omar	Pr Ass	Oto-rhino-laryngologie
312	AMOCH Abdelaziz	Pr Ass	Urologie
313	ZAHLAN Safaa	Pr Ass	Neurologie
314	EL MAHFOUDI Aziz	Pr Ass	Gynécologie-obstétrique
315	CHEHBOUNI Mohamed	Pr Ass	Oto-rhino-laryngologie
316	LAIRANI Fatima ezzahra	Pr Ass	Gastro-entérologie
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318	DAFIR Kenza	Pr Ass	Génétique
319	CHERKAOUI RHAZOUANI Oussama	Pr Ass	Neurologie
320	ABAINOU Lahoussaine	Pr Ass	Endocrinologie et maladies métaboliques
321	BENCHANNA Rachid	Pr Ass	Pneumo-phtisiologie
322	TITOU Hicham	Pr Ass	Dermatologie
323	EL GHOUL Naoufal	Pr Ass	Traumato-orthopédie

324	BAHI Mohammed	Pr Ass	Anesthésie-réanimation
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326	DREF Maria	Pr Ass	Anatomie pathologique
327	ENNACIRI Zainab	Pr Ass	Psychiatrie

328	BOUSSAIDANE Mohammed	Pr Ass	Traumato-orthopédie
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338	MERBOUH Manal	Pr Ass	Anesthésie-réanimation
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342	ATBIB Yassine	Pr Ass	Pharmacie clinique
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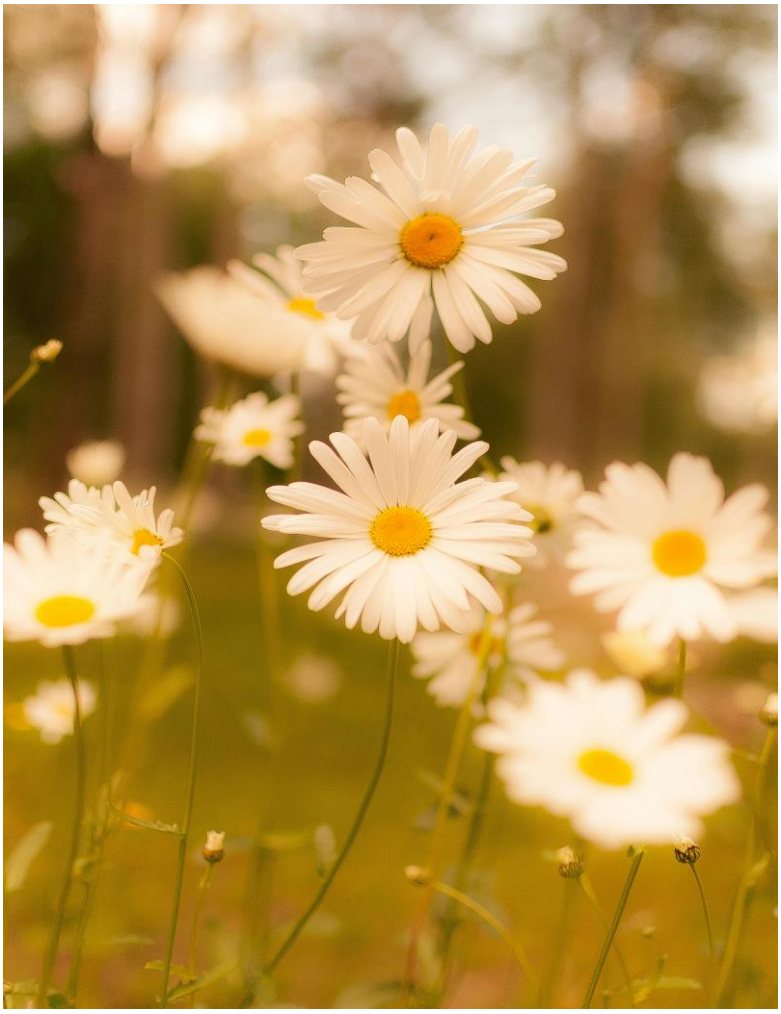
344	MOURAFIQ Omar	Pr Ass	Traumato-orthopédie
345	HENDY Iliass	Pr Ass	Cardiologie
346	HATTAB Mohamed Salah Koussay	Pr Ass	Stomatologie et chirurgie maxillo faciale

LISTE ARRETEE LE 04/10/2024

DEDICATIONS

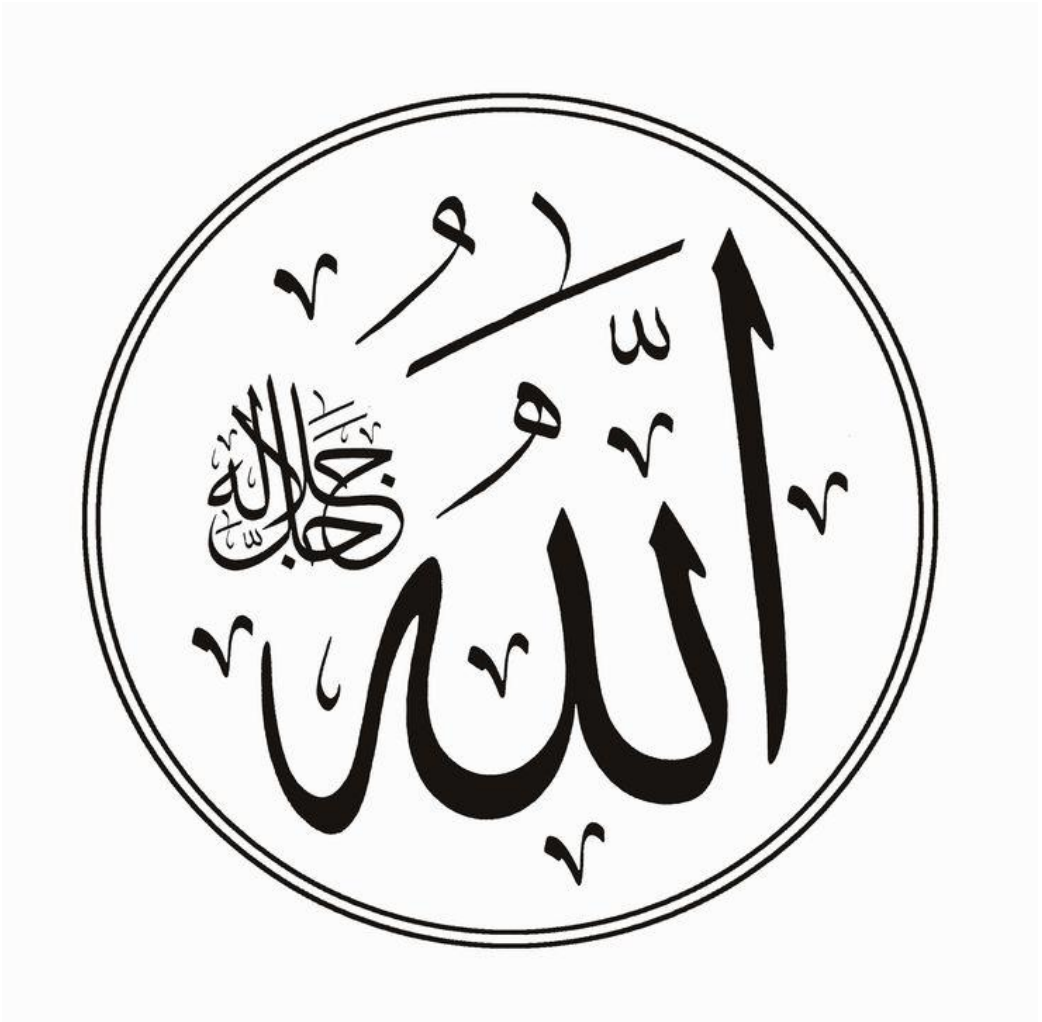
« Soyons reconnaissants aux personnes qui nous donnent du bonheur ; elles sont les charmants jardiniers par qui nos âmes sont fleuries »

Marcel Proust.



Je me dois d'avouer pleinement ma reconnaissance à toutes les personnes qui m'ont soutenue durant mon parcours, qui ont su me hisser vers le haut pour atteindre mon objectif. C'est avec amour, respect et gratitude que

Je dédie cette thèse …



Tout d'abord à Allah,

اللهم لك الحمد حمداً كثيراً طيباً مباركاً فيه عدد خلقك ورضى نفسك وزنة عرشك ومداد كلماتك اللهم لك الحمد ولك الشكر حتى ترضى ولك الحمد ولك الشكر عند الرضى ولك الحمد ولك الشكر دائماً وأبداً على نعمتك

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Mother-Child Hospital - Mohammed VI hospital center Marrakech

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List of Abbreviations

- **FCC** : Family-Centered Care
- **IV** : Intravenous
- **NIPS** : Neonatal Infant Pain Scale
- **FLACC** : Face, Legs, Activity, Cry, Consolability Scale
- **FPS** : Faces Pain Scale
- **NRS** : Numeric Pain Scale
- **GA** : Gestational Age
- **ED** : Emergency Department
- **AAP** : American Academy of Pediatrics
- **OD** : Odds Ratio
- **SD** : standard deviation
- **Y.O** : years old
- **M.** : month

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INTRODUCTION

The source of comfort during a child's pain is an important area of investigation in pediatric care. Recent studies suggest that the mere presence of a parent can significantly influence a child's perception of pain, underscoring the importance of caregiver's proximity in pain management. [(1)].

Parental presence and involvement had known different stations throughout history, from excluding parents from the procedural settings in early 20th century , to the emergence of « family centered care »in late 20th century. [(2)]

Family-Centered Care (FCC) in pediatrics, focuses on four core concepts : respecting and dignifying children and their families, sharing information clearly involving communication with, and making information available to patients and family in format they understand, participation requires including the family in decision making and the child's care at the level the family chooses, and collaborating including partnership with families to improve policies and programs. Its goal is to enhance both patient and family satisfaction and care outcomes. Additionally, FCC influences healthcare delivery at all levels, from institutional policies to daily interactions between staff and families.[(3)]

As a definition, Pain perception refers to the subjective experience of pain, resulting from a complex interaction of sensory input, cognitive evaluation, and emotional responses. [(4)]

Whereas, parental presence during the child's care in a hospital involves both the physical and emotional involvement of a parent or caregiver, contributing to the child's comfort and well-being. It encompasses direct support, participation in care, advocacy, and the impact on the child's emotional and psychological state during medical treatment.

Despite the fact that most research supports the positive effects of parental presence on reducing pain and anxiety. Nevertheless, some reseach shows little to no significant decrease in the pain level of the children [(5)] ,or even reported increased anxiety levels. [(6)]

Moreover the impact of parental presence within our local hospitals is still to be studied and investigated.

Thus, The purposes of our study are as follow :

- Evaluate the effect of parental presence on pain perception in the child, in comparison with parental absence, across different age groups, focusing specifically on routine medical procedures at Mohammed VI Hospital Center, that most parents perceive as non invasive and are generally willing to attend.
- Study different Factors that might impact the outcome.
- Profile preferences of both parents and professional healthcare workers regarding parental presence.
- Compare the results to the data of medical literature.
- Suggest recommandetions to optimize the comfort of the child and minimize pain perception during healthcare procedures.

MATERIALS AND METHODS

I. Materials

1. Type of study :

This prospective observational comparative study was conducted over a four month period, from May 2024 to August 2024, at the Medical and Surgical Pediatric Emergency Department and Pediatric B Department of Mohammed VI University Hospital center in Marrakesh. The study population included children ranging from newborns to 15 years old, undergoing a painful medical procedure.

Pain levels were measured using age appropriate, validated pain scales at three defined time points: pre-procedure, intra-procedure, and post-procedure. Alongside these pain assessments, demographic informations were systematically gathered for each child, their parent or legal guardian, and the attending healthcare professional.

Data was collected from parents and healthcare providers through a structured questionnaire (Appendix 1), which included multiple choice questions designed to Identify personal preferences regarding parental presence during medical procedures and relevant procedural details. This approach ensured comprehensive data acquisition to analyze the relationship between demographic factors, parental involvement, and pain perception in pediatric patients.

2. Inclusion Criteria

The study include participants who meet the following criteria:

- **Age Range**: Children aged from 0 to 15 y.o.
- **Medical Procedures**: Participants must be scheduled to undergo a medical procedure.
- **Accompaniment**: Each child must be accompanied by a parent or legal guardian.
- **Newborn Specification**:
    - **Gestational age**: only those born at a gestational age (GA) of 37 weeks to 41 weeks and 6 days will be included, indicating that they are at term.
    - **Feeding Protocol**: The time of the last feeding for these newborns must be at least 30 to 40 minutes prior to the the procedure, to minimize discomfort caused by hunger and allow better tracking of pain related discomfort during the procedure.

- **Apgar Score**: Eligible newborns should have a normal Apgar score at birth, defined as a score of 7 or higher, which indicates satisfactory physiological status.

3. Exclusion Criteria

Participants will be excluded from the study based on the following criteria:

- **Agitation**: Children exhibiting signs of great agitation or distress prior to the procedure will be excluded, as this may compromise their ability to cooperate during the medical intervention.
- **Psychomotor Disorders**: Participants with diagnosed psychomotor disorders that could interfere with the assessment of pain and procedural compliance will not be included, to ensure accurate evaluation of pain.
- **Newborn Specifications**: Preterm newborns (born before 37 weeks of gestation) will be excluded from the study. As preterm infants may exhibit distinct characteristics in pain perception and neurological development.
- **Neurological Abnormalities**: Children presenting neurological abnormalities that could impact the evaluation of their pain will also be excluded from participation.

4. Study sample :

Our study was conducted within the Pediatric B department and the Medical and Surgical Emergency department. Initially, we randomly selected patients and recorded each one using a progress tracking sheet (Appendice 2). Parents were then asked either to stay or leave in order to balance group sizes and ensure comparability for analysis.

The study involved 220 pediatric patients undergoing painful medical procedures, with the presence or absence of a legal guardian assigned as follows:

a. "Present Parent" Group: Patients in this group were accompanied by a legal guardian (such as a mother, father, or relative) during the procedure.

b. "Absent Parent" Group: In this group, some guardiens chose to be absent voluntarily, If the

group needed balancing, some guardians were asked to leave. allowing us to evaluate the effects of the guardian's absence on the child's pain perception.

To analyze the influence of age on procedural experiences, each primary group was further divided into five age categories:

- **Newborns**: 0 to <1 month
- **Toddlers and Infants**: 1 month to <3 years
- **Preschool Children**: 3 to <6 years
- **School-Aged Children**: 6 to <10 years
- **Teenagers**: 10 to <15 years

II. Methods :

1. Questionnaire :

The study employed a comprehensive questionnaire consisting of three types of questions: open ended, closed ended, and multiple choice questions, structured across five pages (refer to Appendice1). Additionally, the questionnaire included four validated pain scales (refer to Appendice 3) designed to assess pain perception across different pediatric age categories.

A bibliographical research study was conducted to identify the most appropriate pain scale for each age group. The following scales were selected based on their efficacy and widespread use:

a. **NIPS (Neonatal Infant Pain Scale):** Recognized globally as the most frequently utilized pain assessment tool for neonates, the NIPS effectively evaluates pain through behavioral indicators [(7)].
b. **FLACC (Face, Legs, Activity, Cry, Consolability Scale):** This observational behavioral pain scale has been identified as one of the most effective tools for assessing procedural, postoperative, and acute pain in toddlers and infants [(8) (9) (8)] .

c. **FPS (Faces Pain Scale):** The Wong-Baker FACES Pain Scale is particularly useful for preschool children, facilitating communication and enabling medical practioners to better assess the child's pain levels [(10)].

d. **NPS (Numeric Pain Scale):** Suitable for children aged six years and older, the Numeric Pain Scale allows for verbal self-reporting, enabling children to quantify the severity of their procedural pain effectively [(11)].

This approach to pain assessment takes into account the developmental needs and communication skills of each age group, creating a reliable way to accurately evaluate pediatric pain during medical procedures.

2. Data collection :

After obtaining informed consent, interviews were conducted with parents or legal guardians, as well as medical practitioners involved in the care of the pediatric patients.

Acute procedural pain was systematically evaluated at three designated time points: 5 minutes prior to the procedure (T-1), immediately during the procedure (T-0), and 5 to 10 minutes post procedure (T+1).

The investigator responsible for data collection meticulously recorded the findings on the questionnaire paper. Subsequently, this data was transferred into a "Google Forms" spreadsheet, enabling automated data conversion into an Excel format for comprehensive statistical analysis.

3. Statistical analysis :

For the statistical analysis in this medical study, Python was utilized, Matplotlib and Seaborn were employed to generate detailed graphs illustrating key trends, while SciPy facilitated rigorous statistical testing. This integration of tools enabled precise analysis, ensuring reliable and interpretable results.

In this study, the Mann-Whitney U test was used to compare parameters such as pain scores between two independent populations. This non parametric test is appropriate for assessing

differences in groups that do not follow a normal distribution, allowing for a robust evaluation of the distributions of the measured outcomes.

In addition to the Mann-Whitney U test, linear regression analysis was used to assess the influence of age on pain perception. This approach facilitated the exploration of trends and associations between age and pain scores, revealing how age variations may impact pain perception across populations.

4. Ethical Considerations:

All parents were informed of the purpose of the study and freely consented to participate. We ensured the anonymity and confidentiality of the data for all participants.

RESULTS

A. Descriptive Analysis :

I. Child related Data :

1. Demographical Data :

1.1 Child's gender :

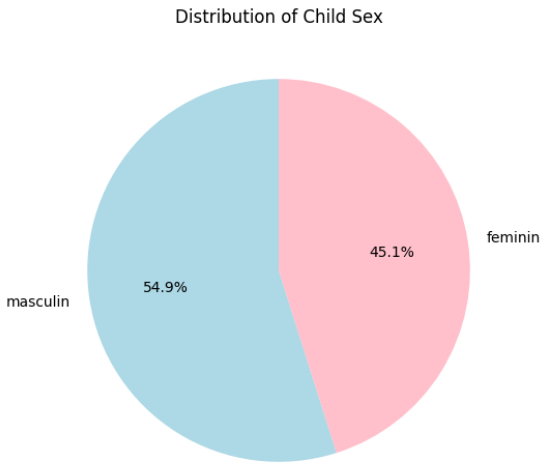

Figure 1 : Distrubtion of child sex

Among a total of 220 children, 54.9% (approximately 121 children) were males, while 45.1% (approximately 99 children) were females (figure 1).

1.2 Age :

a) Number of children by age range :

Table 1: Distribution of children across age groups by parental presence and absence

Age Group	Parent Present (Yes)	Parent Absent (No)
0-1 m.	24	31
1m.-3 y.o	22	18
3-6 y.o	24	19
6-10 y.o	17	13
10-15 y.o	28	22

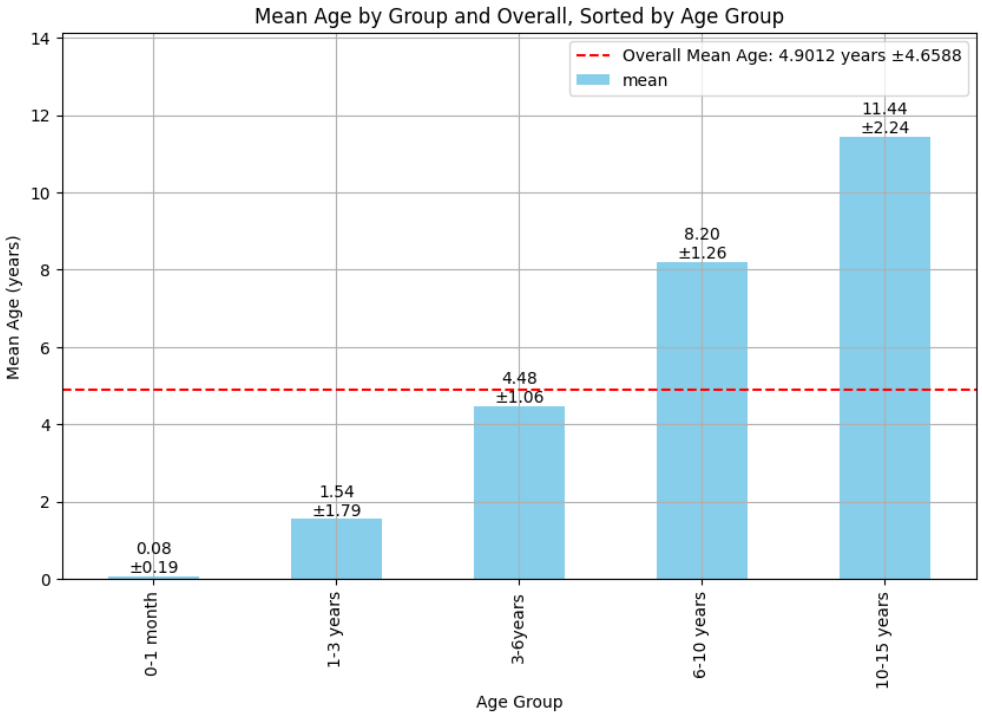

Figure 2 : Mean age by group and overall, sorted by age group

b) Age Groups and Mean Ages (figure 2):

- **0–1 month** : The mean age of the children is 0.08 years (approximately 29 days) ±0.19 SD.
- **1m–3 years**: The mean age of the group is 1.54 years (approximately 1 year and 6 months) ±1.79 SD.
- **3–6 years**: The mean age of the group is 4.48 years ±1.06 SD.
- **6–10 years**: The group has a mean age of 8.20 years ±1.26 SD,
- **10–15 years**: The oldest group has a mean age of 11.44 years ±2.24 SD.

c) Overall Population:

The overall mean age is 4.90 years ±4.66 SD, indicating considerable age diversity with-in the dataset, representing a diverse population sample (figure 2).

d) Age ranges according to groups :

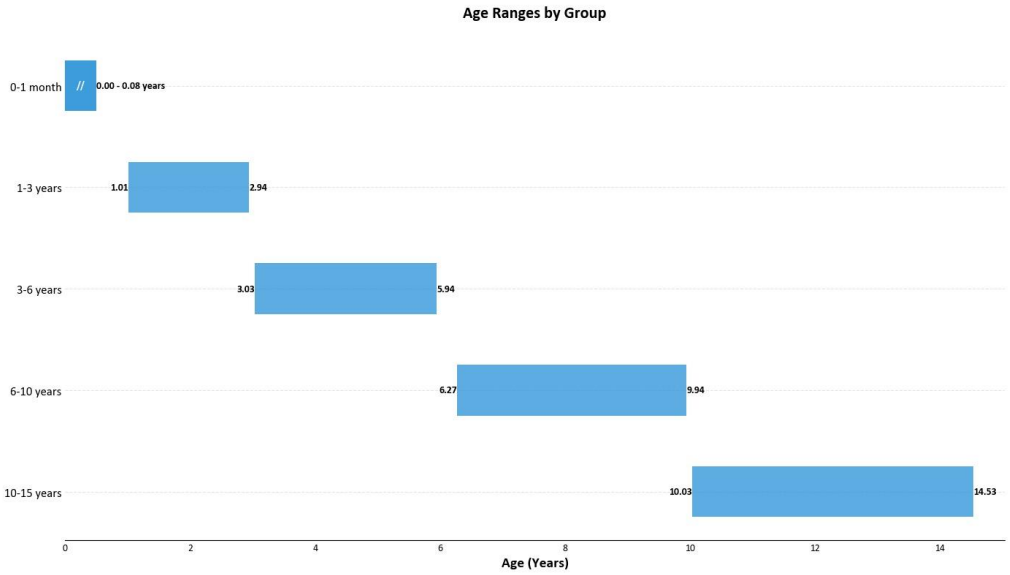

Figure 3 : age range by group

Table 2 : Minimum and Maximum age for each group

Age group	Minimum age	Maximum age
0–1 month	0y 0m 1d	0y 0m 29d
1m–3 years	1y 0m 2d	2y 11m 9d
3y–6years	3y 0m 11d	5y 11m 9d
6–10years	6y 3m 7d	9y 11m 10d
10y–15years	10y 0m 12d	14y 6m 12d

1.3 Residecy city :

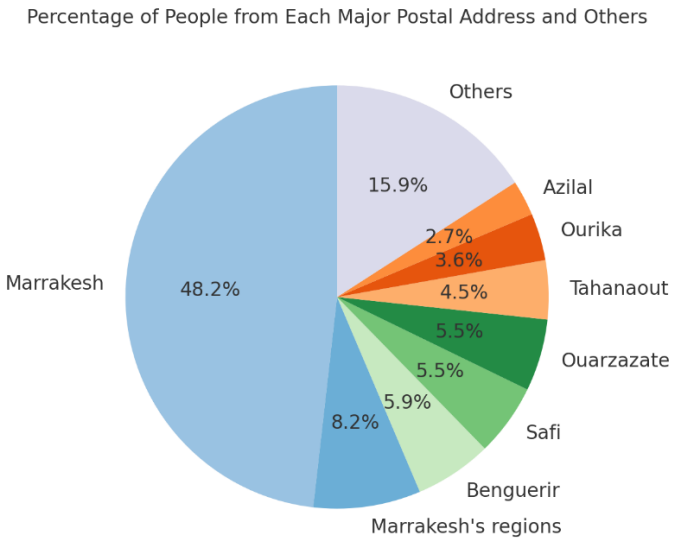

Figure 4 : Percentage of people from each residencial city

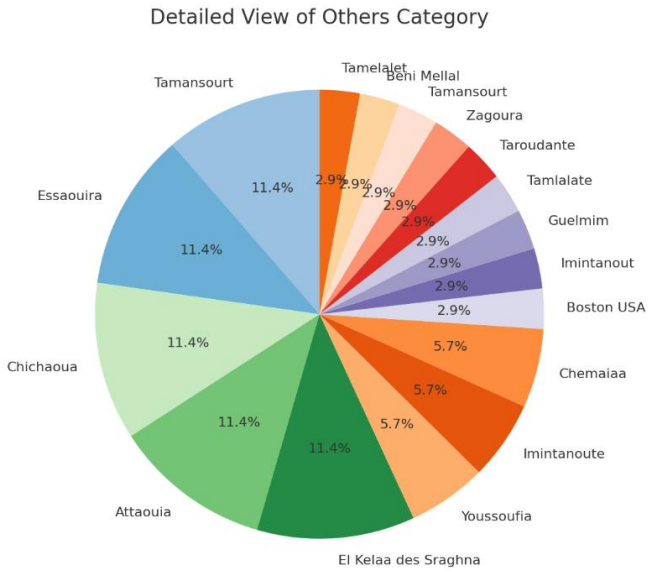

Figure 5 : detailed view of 'others' category

In our dataset , we found that Marrakesh dominates the distribution, comprising nearly half of the population at 48.2% (n=106) , while Marrakesh's regions, Benguerir, Safi and "Others" represent 8.2%, 5.9%, 5,5% and 15.9%, respectively (figure 4) (figure 5).

2. Clinical history :

2.1 Chronic medical condition :

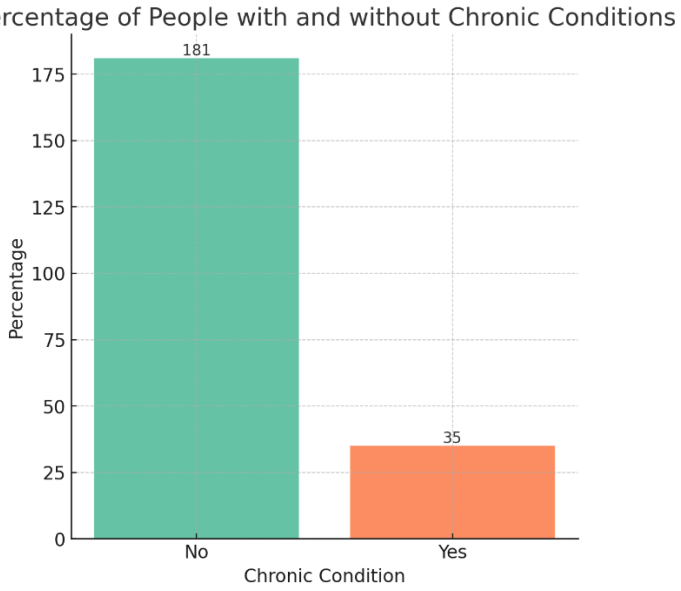

Figure 6 : Percentage of children with and without chronic medical condition

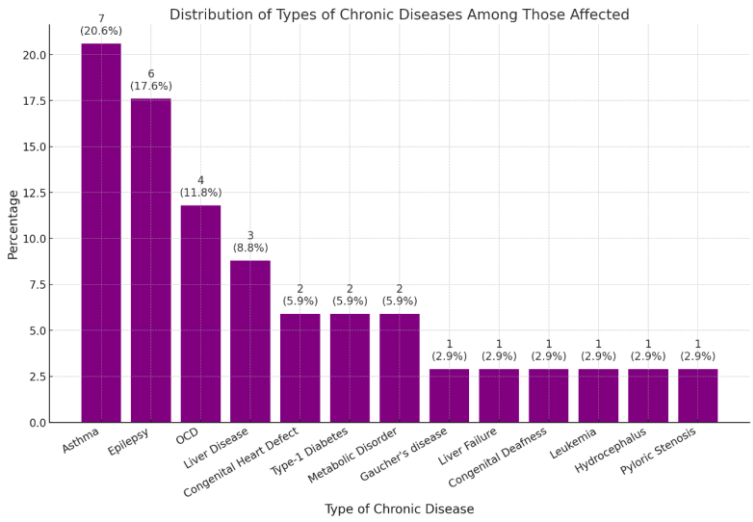

Figure 7 : Distribution of Types of chronic medical condition

In our population, 84.09% (185 individuals) have no chronic conditions, while 15.9% (35 individuals) do, highlighting a majority without chronic diseases (figure 6).

We found that asthma and epilepsy are the most prevalent chronic diseases, with 7 and 6 cases, respectively, while less common conditions such as metabolic and congenital disorders range from 1 to 4 cases each (figure 7).

2.2 Hospital related background :

Table 3 : distrubtion of hospital related antecedents

Category	Yes	No
History of Surgery	17.7%	**81.8%**
Currently hospitalized	39.5%	60.5%
First Time hospital	49.1%	50.9%
First Time procedure	38.6%	**61.4%**
First Time This procedure	**54.1%**	45.9%

The table indicates that 81.8% (180 individuals) of the population have no prior history of surgery. Conversely, over half of the respondents reported that this is not their first experience with hospital visits or medical procedures. However, nearly half of the population indicates that this is their first time undergoing the specific procedure in question,reflecting a significant exposure to new medical treatments within the group (table 3).

II. Parent related Data :

1. demographical data :

1.1 the child's companion :

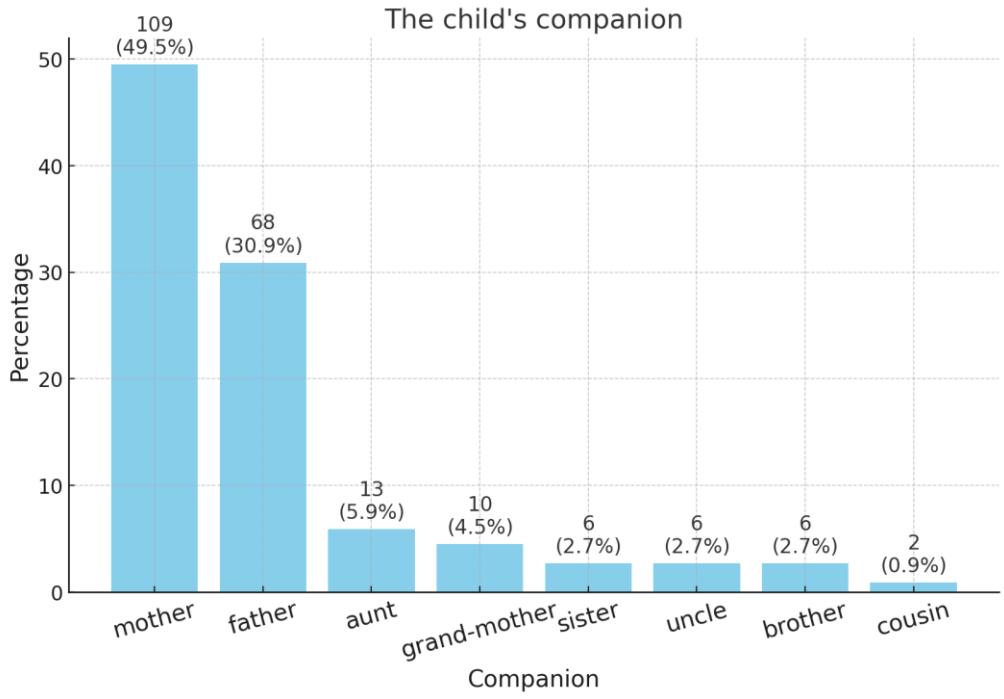

Figure 8 : distribution of the child's companion

Mothers were the most frequent companions present in 49.5% (n=109) of cases, followed by fathers at 30.9% (n=68). Other family members, such as aunts, grandmothers, and siblings, were present in fewer than 6% of cases each. (figure 8).

1.2 the companion's age :

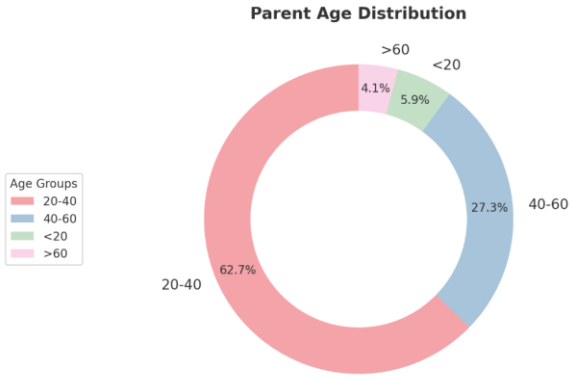

Figure 9 : companion's age distrubtion

The pie chart shows predominantly young adult demographic with 62.7% of parents or caregivers are aged “20-40”, followed by The “40-60” age group makes up 27.3%. Smaller proportions are observed in the “<20” (4.1%) and “>60” (5.9%) age groups (figure 9).

1.3 Marital status :

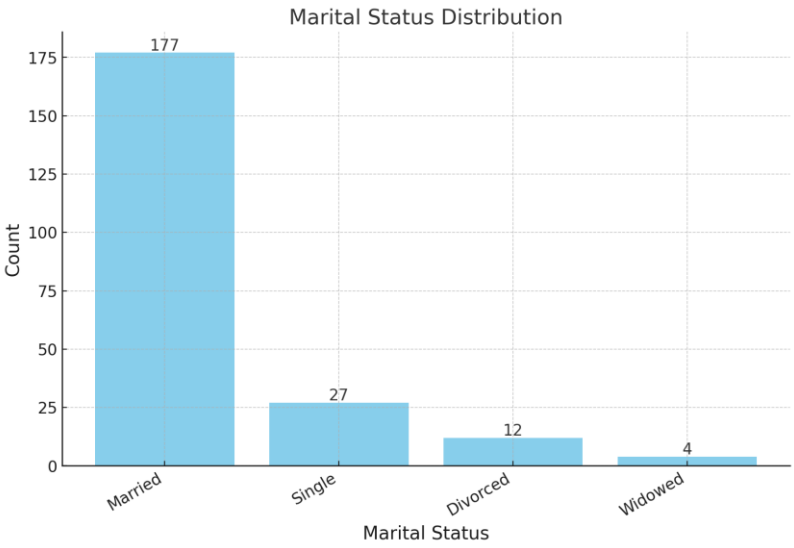

Figure 10 : Marital status distribution

Within our companions, the majority are married 80,45 % (n=177), with 12,27 % (n =27) single, 5,45 % (n =12) divorced, and only 1,81 % (n=4) widowed (figure 10)..

1.4 Origin :

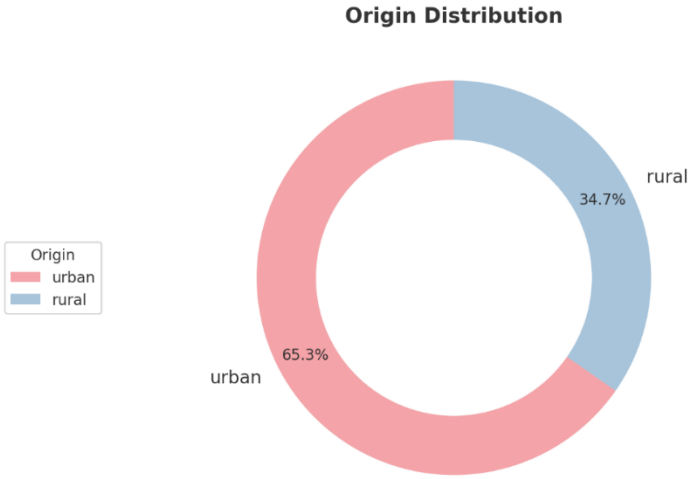

Figure 11 : companion’s origin distribution

The chart indicates that 65.3% of individuals are from urban areas, while 34.7% are from rural areas (figure 11).

1.2 time spent with the child daily :

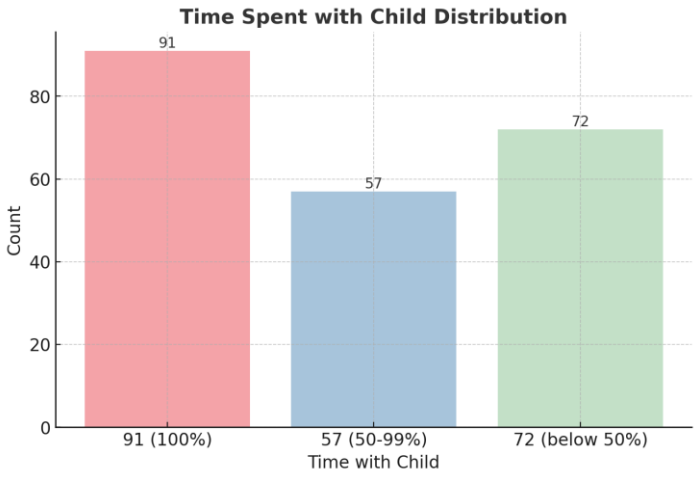

Figure 12 : distibution of companion's time spent with the child daily

Full-time caregivers represent the largest group at 41.4% (91 cases), followed by the "below 50%" category at 32.7%. The "between 50-99%" category has the smallest proportion at 25.9% (figure 12).

2. Medical history :

Table 5 : distribution of psychological and chronic pain history within companions

Category	Yes	No
Psych Disease History	7.7%	92.3%
Chronic Pain History	12.7%	87.3%

We observe a low percentage of psychological diseases, with only 7.7% (17 individuals) affected. Additionally, a minority of 12.7% (28 individuals) report a history of chronic pain. Over 87% of individuals in each category do not report these conditions(table 5).

3. Multiple choice Data :

3.1 Parental preference :

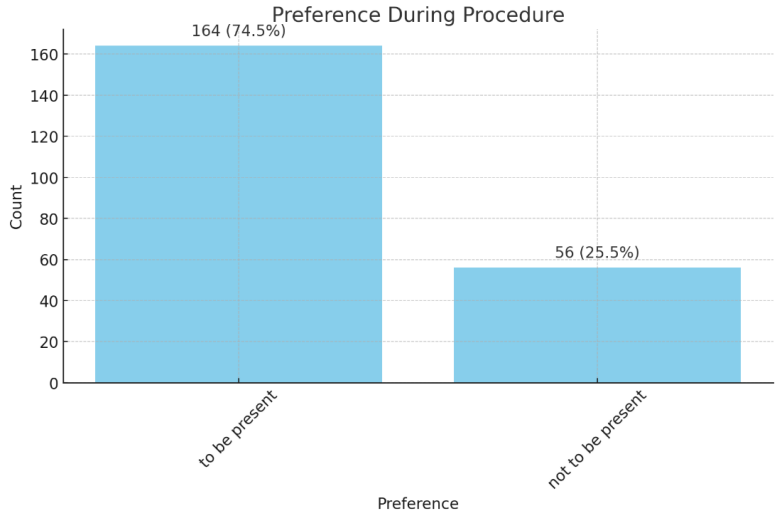

Figure 13 : distribution of parental preference during medical procedures

The strong majority of compagnions : 74.5 % (163 individuals) prefer to be present during their children's medical procedures. Conversely, a much smaller portion of caregivers 25.5 % (56 individuals) prefer not to be present (figure 13).

3.2 Raisons to be present

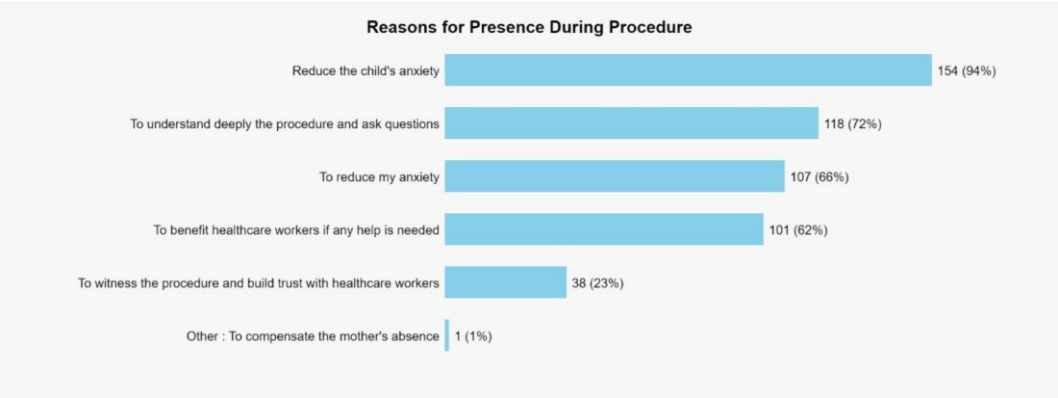

Figure 14 : companions reasons for presence during procedures

Among 163 companions who chose to be present, 94% (154) cited reducing the child's anxiety as their primary reason, while 72% (118) mentioned understanding the procedure and asking questions. Approximately 66% also cited reducing their own anxiety and 62% assisting healthcare workers as motivations.(figure 14)

A smaller proportion 23 % (38) prioritized witnessing the procedure to build trust with healthcare workers, and one companion cited compensating for the mother's absence as a significant motive. (figure 14).

3.3 Raisons not to be present :

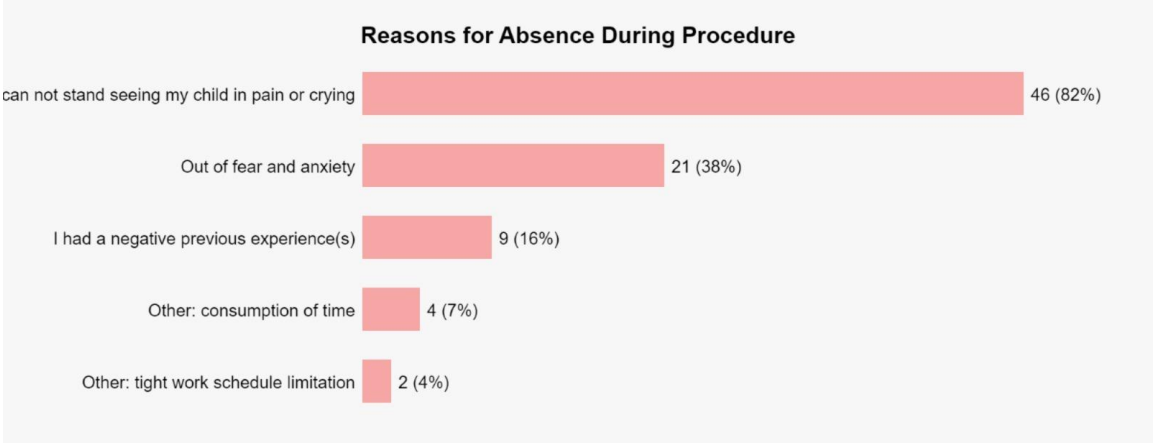

figure 15 : companions reasons for absence during procedures

Among 56 individuals who chose not to be present, the primary reason for absence was the inability to witness the child's pain or distress (46 responses). General fear and anxiety were the second most common reasons (21 responses), followed by previous negative experiences (9 responses).

Practical constraints, such as "consumption of time" (4 responses) and "tight schedule limitations" (2 responses), were less significant compared to emotional factors (figure 15).

III. Medical staff related Data :

1. Demographical Data :

1.1 Medical staff participation distribution :

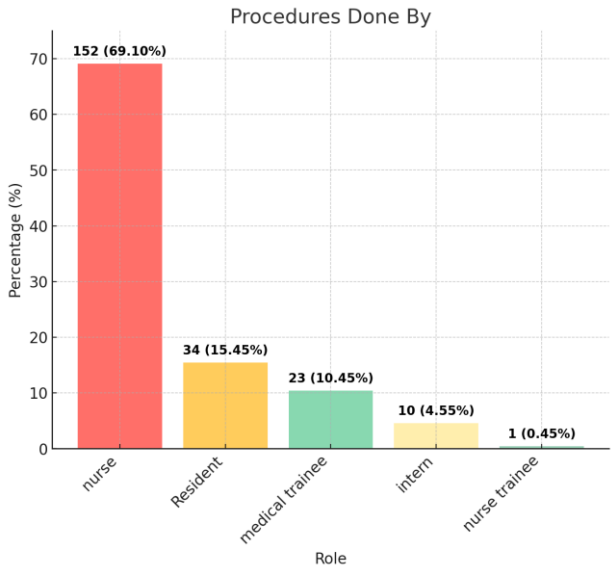

Figure 16 : Caregiver participation in procedure

In our dataset, we found that Nurses conducted the majority of procedures, accounting for 69.10% (n=152). Residents performed 15.45% (n=34), medical trainees handled 10.45% (n=23), and interns were responsible for 4.55% (n=10). Nurse trainees conducted the fewest procedures, at 0.45% (n=1)

(figure 16).

1.2 medical staff Gender :

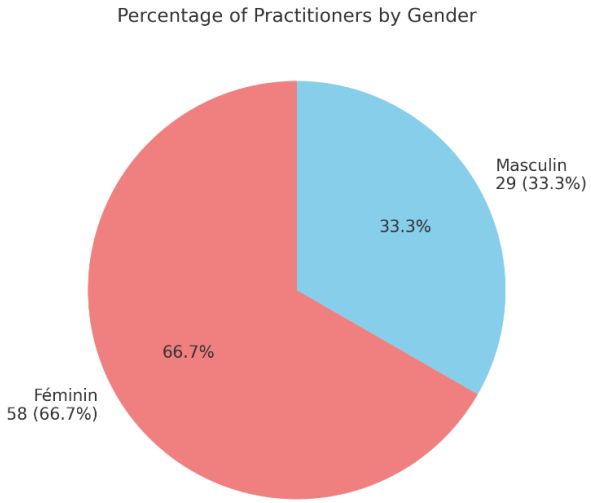

Figure 17 : percentage of practioners by gender

The pie chart shows that female health practitioners make up the majority at 66.7% (n=58), while male practitioners represent 33.3% (n=29) of the total (figure 17).

1.3 Practioner's experience :

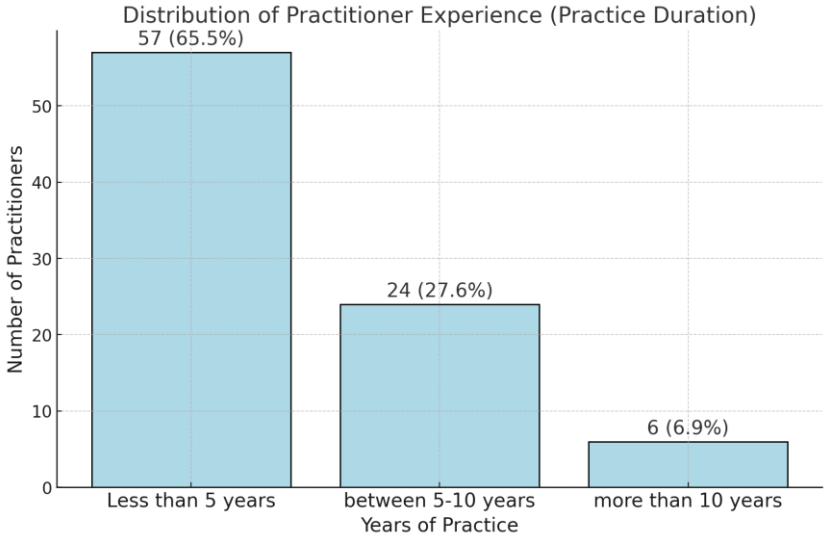

Figure 18 : Distribution of practioner experience

The bar chart displays the distribution of practitioners by years of experience. The majority, 65.5% (n=57), have less than 5 years of practice, indicating early career stages. Those with 5 to 10 years of experience account for 27.6% (n=24), while practitioners with over 10 years of experience represent only 6.9% (n=6) (figure 18).

2. Multiple choice Data :

2.1 Practioner preference :

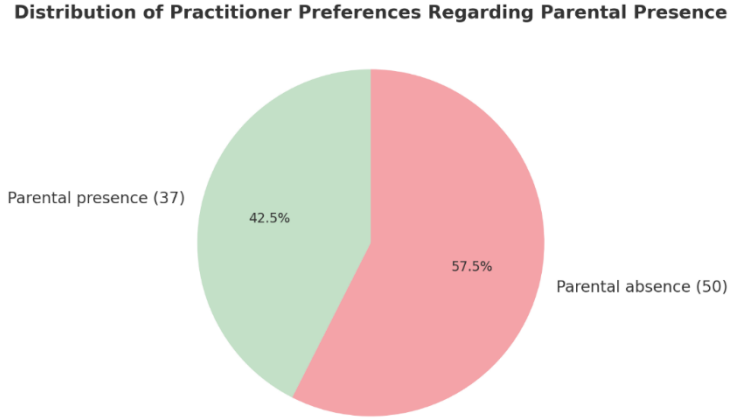

Figure 19 : distribution of Practioner preference regarding parental presence

The pie chart shows that 57.5% (n=50) of practitioners prefer parental absence during medical procedures, whereas 42.5% (n=37) prefer parental presence (figure 19).

2.2 Perceived Benefits :

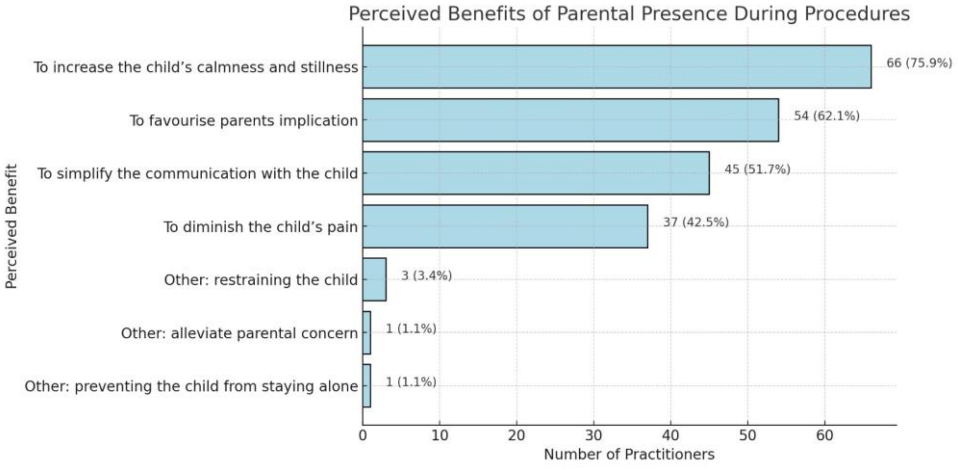

Figure 20 : Perceived benefits of Parental presence during Procedures

In our sample, the primary perceived benefit of parental presence during medical procedures was "to increase the child's stillness," cited by 75.9% (66) of practitioners. This was

followed by "to encourage parental involvement" (62.1%) and "to simplify communication with the child" (51.7%, n=45).

Diminishing the child's pain was perceived as less significant, noted by 42.2% (n=37). Additional reasons included "restraining the child" (3.4%, n=3), "alleviating parental concern" (1.1%, n=1), and "preventing the child from staying alone" (1.1%, n=1) (figure 20).

2.3 Perceived inconveniences :

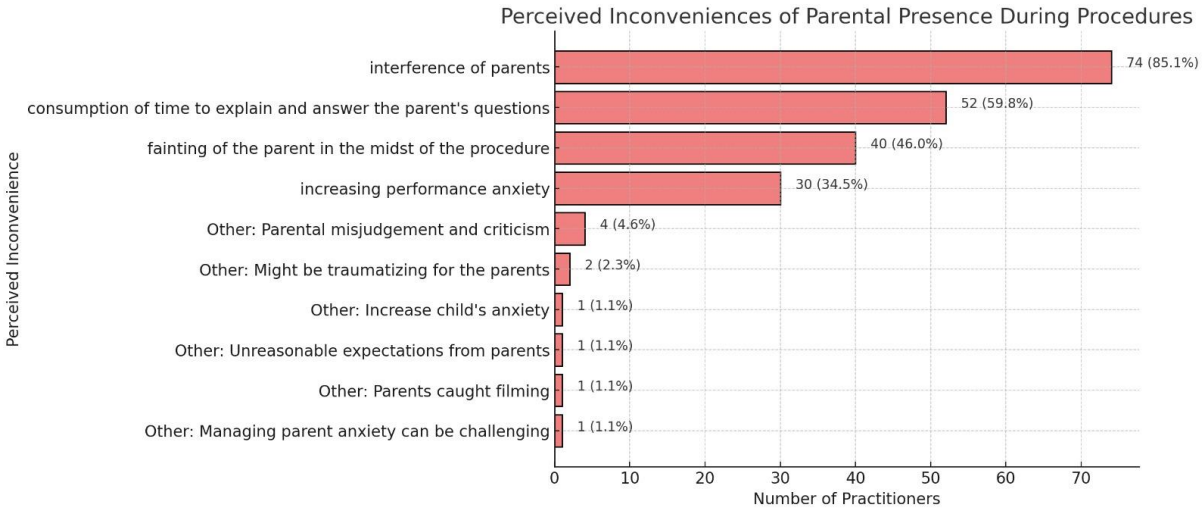

figure 21 : perceived inconveniences of parental presence during procedures

The primary inconvenience of parental presence during procedures, reported by 85.1% (n=74) of practitioners, is "interference of parents." This is followed by "consumption of time to explain and answer the parent's questions" at 59.8% (n=52). Notable concerns also include "fainting of the parent during the procedure" (46%, n=40) and "increasing performance anxiety" (34.5%, n=30).

Additional minor but noteworthy concerns include "parental misjudgment and criticism" (4.6%, n=4), "potential trauma to the parents" (2.3%, n=2), and "increasing the child's anxiety" (1%, n=1). (figure 21).

IV. Procedure Related Data :

1. Type pf procedure :

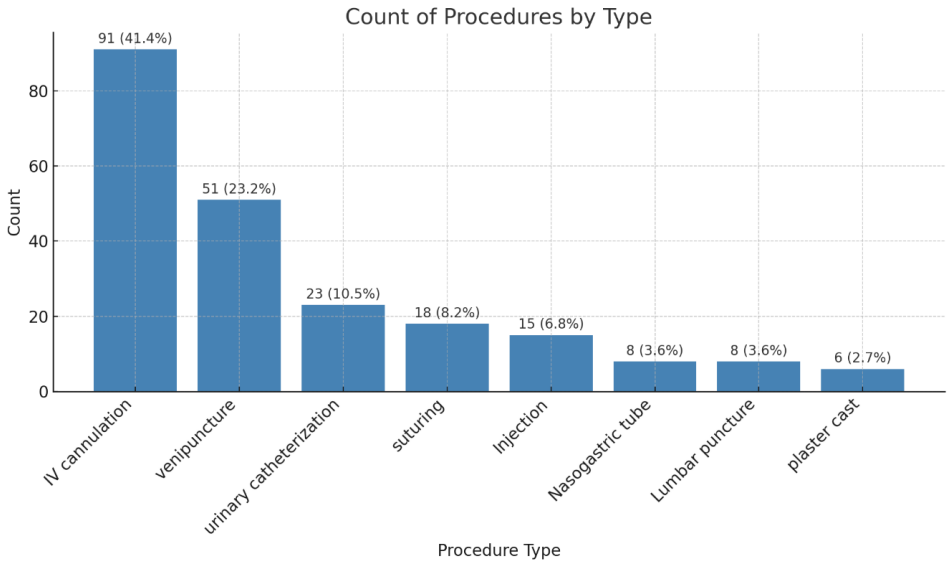

Figure 22 : distrubtion of procedure types

The most frequent procedure is "IV cannulation," comprising 41.4% (n=91) of the total. This is followed by "Venipuncture" at 23.2% (n=51) and "Urinary catheterization" at 10.5% (n=23). Procedures such as "Injection," "Suturing," and "Nasogastric tube insertion" are performed less frequently, each representing a smaller portion of the total (figure 22).

2. Anelgesic use :

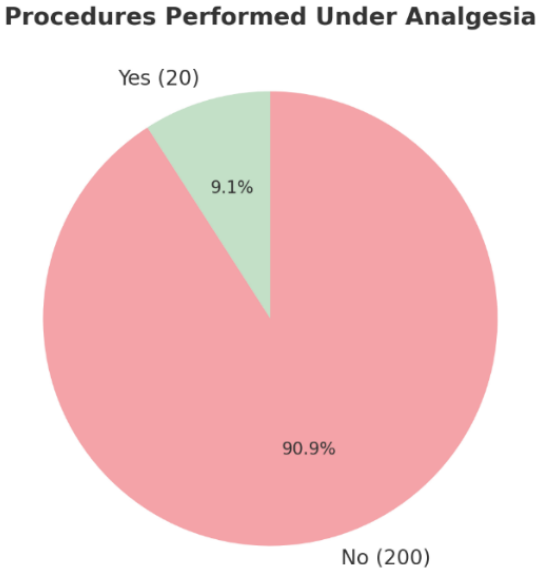

Figure 23 : distribution of analgesia

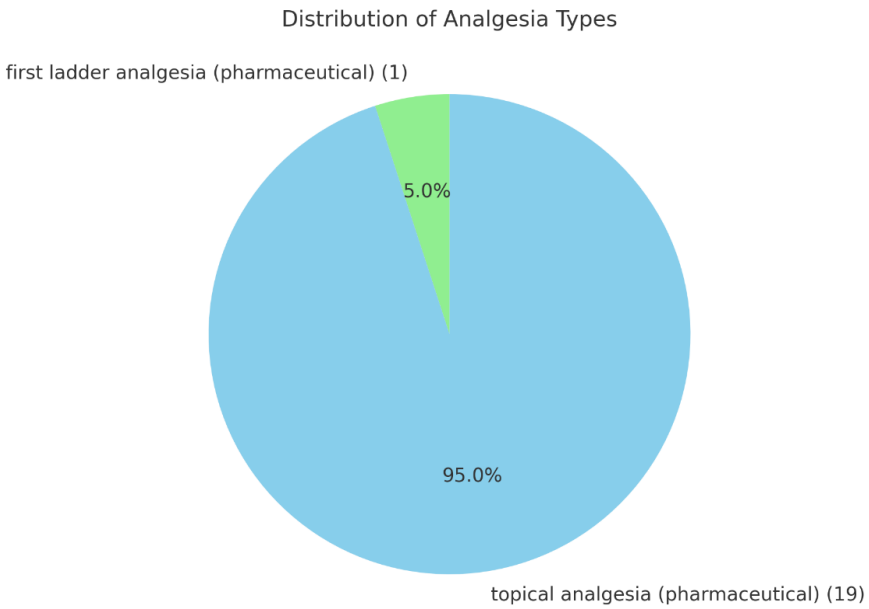

Figure 24 : Distribution of analgesia types

A limited use of analgesia was noticed with only 20 out of 220 using it (figure 23) ,19 of procedures used topical analgesia .Conversely, only 1 procedure employed first ladder analgesia (figure 24).

3. Pain evaluation/ clinical observation :

3.1 Used Method for Normalizing Pain Scores :

To enable accurate comparison and aggregation of pain scores from different assessment tools, a normalization process was applied. This method standardizes scores to a common scale, ensuring unified interpretation across various pain measurement instruments.

Each pain score was adjusted to fit within a standardized scale ranging from 0 to 1. The following approach was used:

For each pain score, the minimum and maximum possible values of the respective scale were identified. The score was then normalized by applying the formula:

$$Normalized\ Score = \frac{Observed\ Score - Minimum\ Possible\ Score}{Maximum\ Possible\ score - Minimum\ Possible\ score}$$

This formula standardizes all scores to a scale of 0 (lowest pain) to 1 (highest pain). For instance, the Neonatal Infant Pain Scale (NIPS), which ranges from 0 to 7, was normalized to align with other pain scores that typically range from 0 to 10.

3.2 The mean:

The pain score is significantly higher "during the procedure", averaging 0.57 compared to "5mins to just before the procedure" score (0.14) (This score is attributed to some patients experiencing pain related to their acute or chronic medical conditions) and "5mins to 10 mins after the procedure" (0.11). (figure 25, table 4)

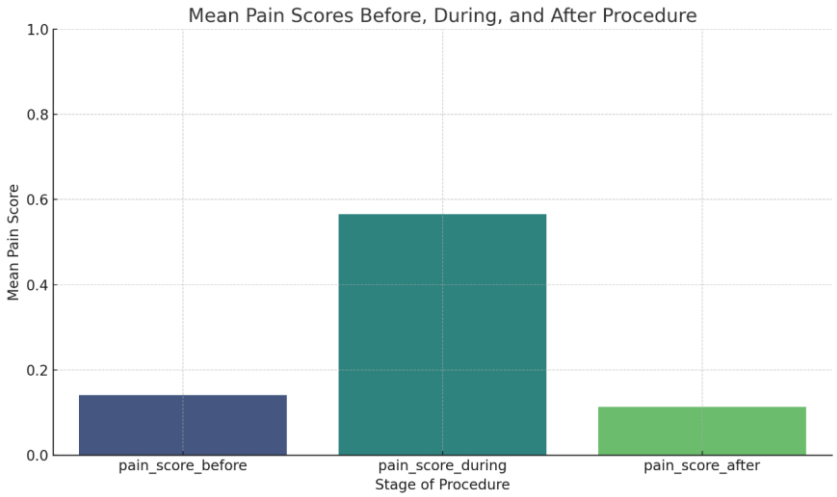

Figure 25 : mean pain score before, during and after the procedure

3.3 The median :

The pain score during the procedure has a wider distribution, with a median of 0.6 and several outliers, indicating variability in patient experiences. In contrast, pain scores before and after the procedure are generally lower and less variable (figure 26, table 5).

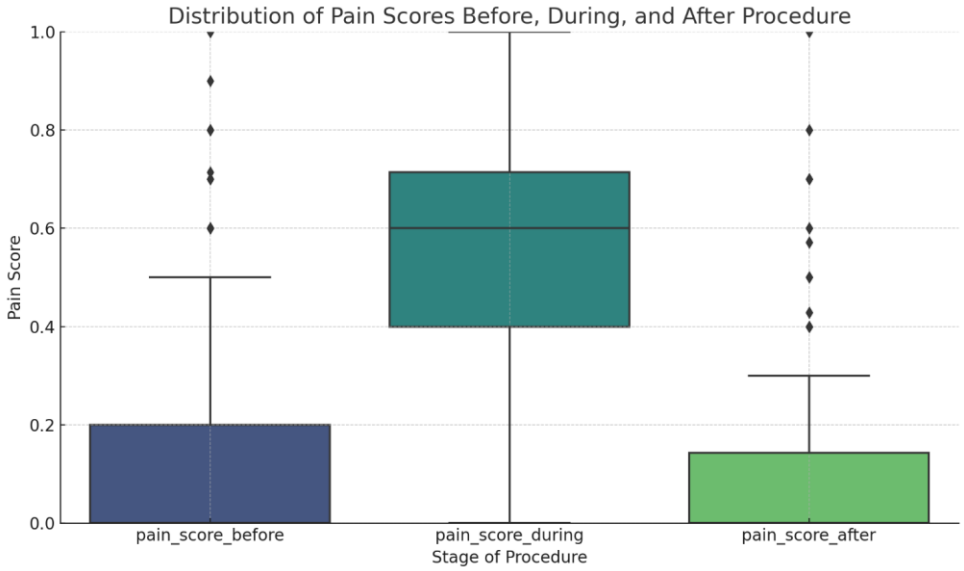

Figure 26 : Distribution of pain score Before, During and after the procedure

3.4 Quartile distribution :

The study assessed pain scores in 220 patients before, during, and after a medical procedure, focusing on quartile distribution. (table5)

This analysis shows that while the procedure caused significant pain for many, the discomfort was temporary, with most patients experiencing a rapid return to low pain levels afterward :

- Before the procedure, pain was minimal, with a median score of 0.00 and the top 25% of patients reporting scores of 0.20 or higher.
- During the procedure, pain increased notably, with the lower quartile at 0.40, the median at 0.60, and the upper quartile at 0.71.
- After the procedure, pain levels decreased quickly: the lower quartile and median returned to 0.00, and the upper quartile dropped to 0.14

3.5 The standard deviation :

We observed the highest variability in pain experiences during the procedure, with a standard deviation of 0.25 (table5).

3.6 The mode :

A value of 0.00 before and after the procedure indicates that most patients experienced no pain during these stages (table 5).

Table 5 : Descriptive Statistics of Pain Scores Before, During, and After the Procedure

	Pain score Before	Pain score during	Pain score after
Count	220.00	220.00	220.00
Mean	0.14	0.57	0.11
Std	0.23	0.25	0.19
Min	0.00	0.00	0.00
25%	0.00	0.40	0.00
50%	0.00	0.60	0.00
75%	0.20	0.71	0.14
Max	1.00	1.00	1.00
mode	0.00	0.60	0.00

4. Success of the procedure :

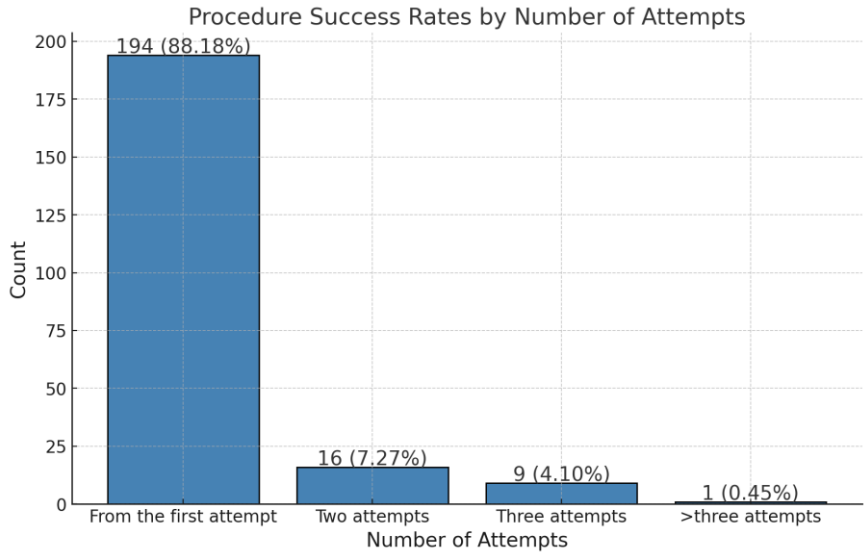

Figure 27 : Procedure success rates by number of attempts

The majority of procedures were successful on the first attempt (88.18%). Only 16 procedures required two attempts, 9 required three attempts, and 1 procedure was attempted more than three times (figure 27).

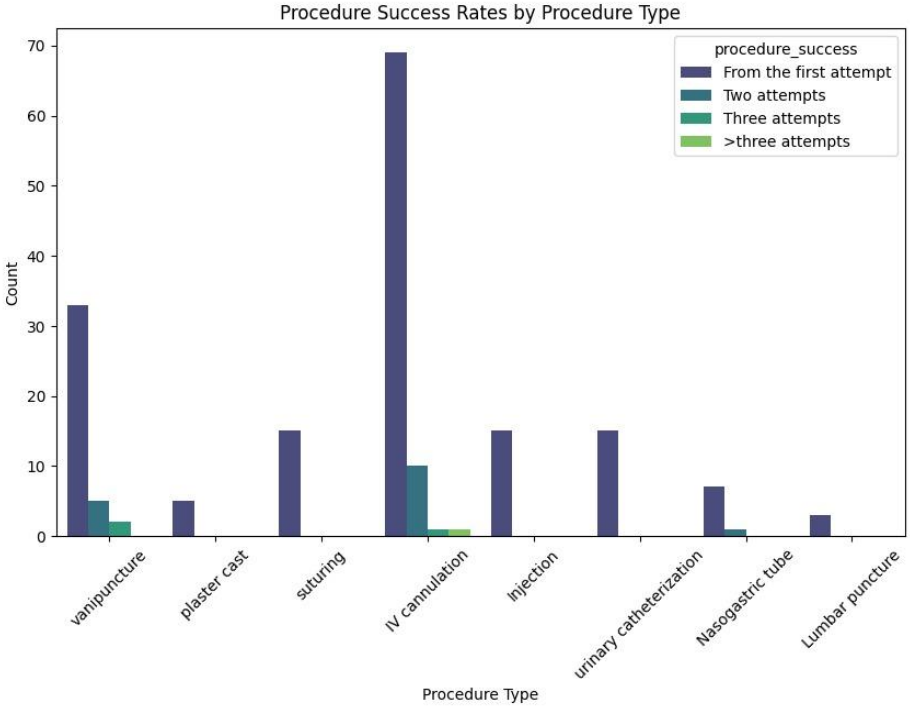

Figure 28 : Procedure success rates by procedure type

The chart suggests that IV cannulation, venipuncture, and urinary catheterization can sometimes be challenging, requiring more than one attempt in some cases (figure 28)

B. Statistical Tests and Bivariate Analysis :

I. Preliminary Remarks :

1. Denomination :

- Pain score during : pain score recorded during the procedure (at T0).
- Pain score difference which is calculated as :

$$pain\_difference = pain\_during\ (at\ T0) - pain\_before\ (at\ T-1)$$

to effectively capture the immediate impact of procedural pain, this approach accounts for pre-existing pain some children may have had due to their underlying condition, rather than the procedure itself

2. Summary of Statistical Methods Used :

In this study, several statistical methods were applied to analyze the impact of various factors on pain perception and to verify multiple hypotheses. Below is a summary of the key methods utilized:

a. Mann-Whitney U Test:

Purpose: The Mann-Whitney U test is a non parametric test used to compare two independent groups when the data does not meet the assumptions of normality. It ranks the data and tests whether the distributions of two groups are significantly different.

b. Linear Regression:

Purpose: Linear regression is a parametric method used to model the relationship between a continuous dependent variable and one or more independent variables. It assumes that the relationship between the variables is linear.

c. Kruskal-Wallis Test:

Purpose: The Kruskal-Wallis test is a non-parametric alternative to ANOVA, used when comparing three or more independent groups. Like the Mann-Whitney U test, it ranks the data and tests whether the medians across multiple groups are significantly different.

d. Logistic Regression:

Purpose: Logistic regression is used when the dependent variable is binary (e.g., presence or absence of pain above a certain threshold). It estimates the probability of an outcome occurring based on one or more independent variables.

II. The impact of parental presence on pain perception :

1. Impact of Parental Presence –overall group– :

a. The overall group using 'Pain score difference' test :

the Mann–Whitney U test revealed a statistically significant effect of parental presence, with differences in pain score distributions between groups with and without parental presence (U = 4648.5, p = 0.032).(figure 29)

These results indicate that parental presence meaningfully decreases the child's pain experience.

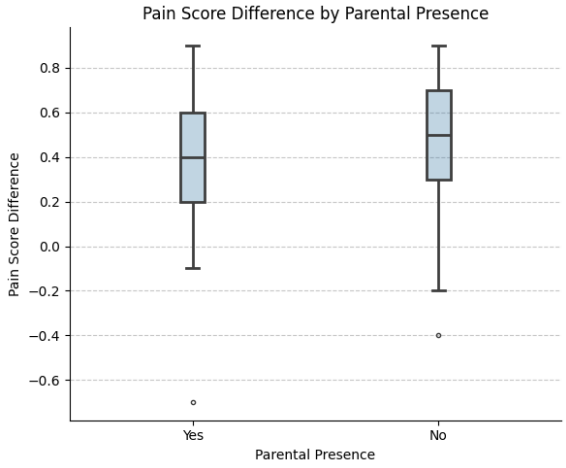

Figure 29 : Pain score difference During – Before according to parental presence or absence

b. The overall group using 'Pain score during' test :

The Mann–Whitney U test yielded a U–statistic of 5406.0 and a p–value of 0.0893.

While this p–value suggests marginal statistical significance, it indicates that parental presence potentially decreases pain during the procedure.

2. Impact of Parental Presence –each subgroup– :

a. Decrease pain perception test using 'Pain difference' :

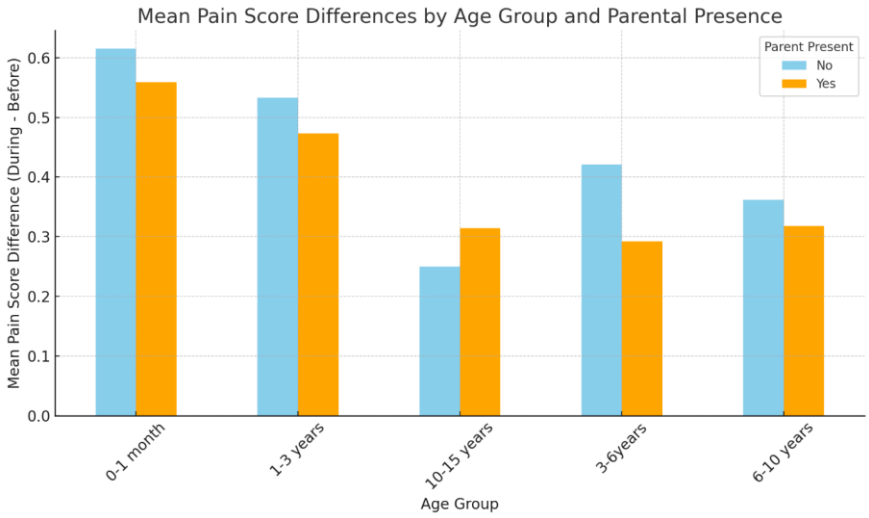

Figure 30: Mean pain score differences by age group and according to parental presence

Table 6 : decreased pain perception–Mann–Whiteny U test– results for each age group

Age Group	Parent Pre–sent (Yes)	Parent Ab–sent (No)	U–statistic	P–value	Statistical Significance
0–1 m.	24	31	290.5	0.0822	**Significant (Decrease in Pain)**
1m.–3 y.o	22	18	156.5	0.1296	Not Significant
3y.o–6 y.o	24	19	170.5	0.0796	**Significant (Decrease in Pain)**
6y.o–10 y.o	17	13	104	0.4004	Not Significant
10y.o–15 y.o	28	22	354	0.8203	Not Significant

This study examines the effect of parental presence on pain reduction across age groups, using a p–value threshold of 0.10 to determine significance, which was chosen in–stead of the conventional 0.05 due to small sample sizes (approximately 20 per group). (fig–ure 30, table 6)

Results indicate potential pain reduction with parental presence in newborns (0–1 month) and preschool children (3–6 years), with p–values approaching significance. No sig–nificant effects are observed in infants and toddlers (1 month–3 years), school–aged children (6–10 years), or the oldest age group (10–15 years). (figure 30, table 6).

c. increase pain perception test using 'Pain difference':

Table 7 : increased pain perception- Mann-Whiteny U test results for each age group

Age Group	Parent Present (Yes)	Parent Absent (No)	U-statistic	P-value	Statistical Significance
0-1 m.	24	31	105	0.8787	Not Significant
1m.-3 y.o	22	18	156.5	0.8761	Not Significant
3-6 y.o	24	19	45	0.926	Not Significant
6-10 y.o	17	13	104	0.6158	Not Significant
10-15 y.o	28	22	238.5	0.0563	**Significant (Increase in Pain)**

The data examines the impact of parental presence on increasing pain perception across various age groups, using a P-value threshold of 10% to determine significance, a threshold chosen due to the small number of members in each subgroup (around 20 per group).

For newbors aged 0-1 month, the results show no statistically significant effect of parental presence on increasing pain perception, as indicated by a high P-value. Similarly, in the 1-3 years, 3-6 years, and 6-10 years age groups, parental presence does not result in any significant increase in pain levels.

However, in the 10-15 years group, parental presence is associated with a statistically significant increase in pain, as indicated by a P-value less than the threshold. This suggests that parental presence may actually exacerbate pain in older children (table 7).

III. Impact of child related factors :

1. The impact of child's age :

a. Linear analysis Using 'pain during':

The regression analysis revealed a significant inverse relationship between the child's age and the pain scores during the procedure, with the coefficient indicating that for each additional year of age, there was a decrease in pain scores by approximately 0.0192 ($p < 0.001$).

This finding is statistically significant and confirms that older children tend to experience lower levels of pain during procedures compared to younger children. The R-squared value of 0.130 indicates that age explains about 13% of the variance in pain scores during procedures, highlighting the importance of age as a factor in pediatric pain management (figure 31).

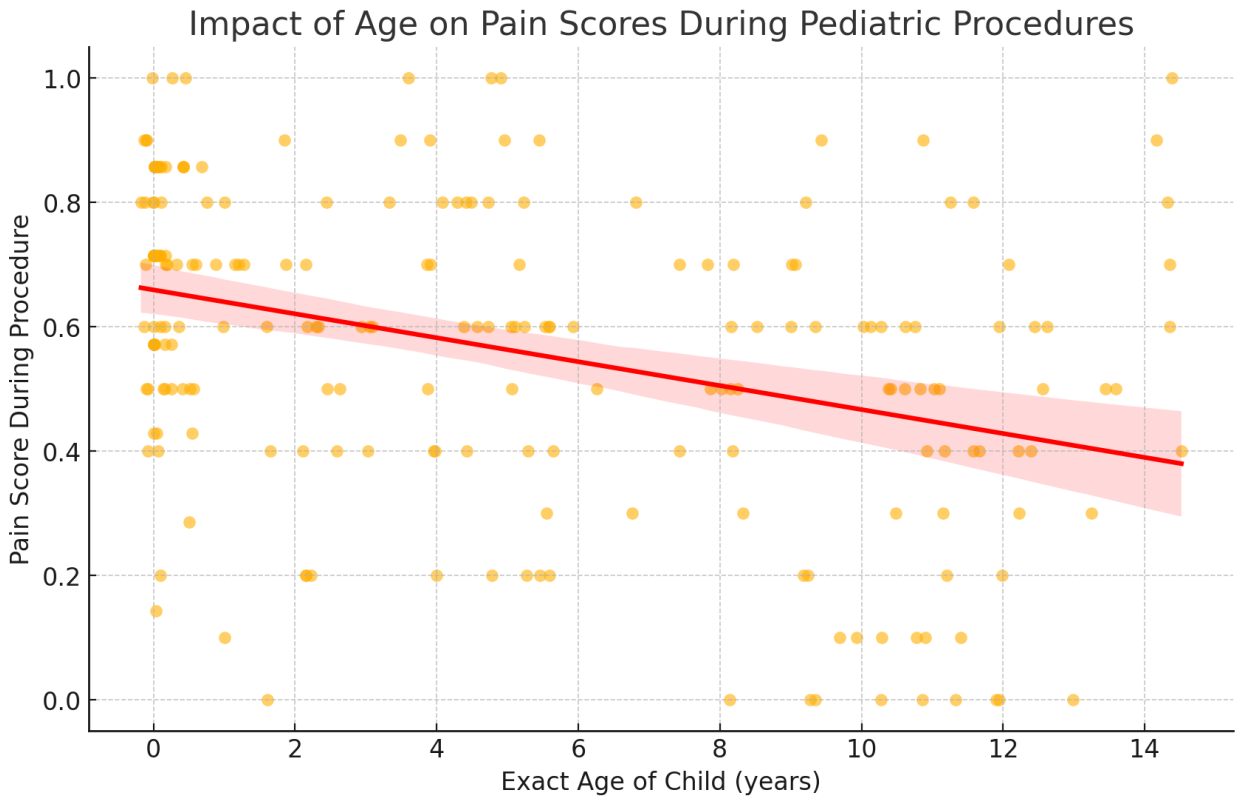

Figure 31 : Impact of age on 'Pain scores during' pediatric procedures

b. Linear analysis using 'pain score difference' :

To further explore the relationship between age and changes in pain perception in pediatric patients, linear regression analysis confirmed for a second time a significant inverse relationship between the child's age and 'the pain difference', with the coefficient indicating that for each additional year of age, 'the pain difference' decreases by approximately 0.0235 ($p < 0.001$).

This finding is statistically significant and suggests that as children get older, the increase in pain from before to during a procedure diminishes (figure 32).

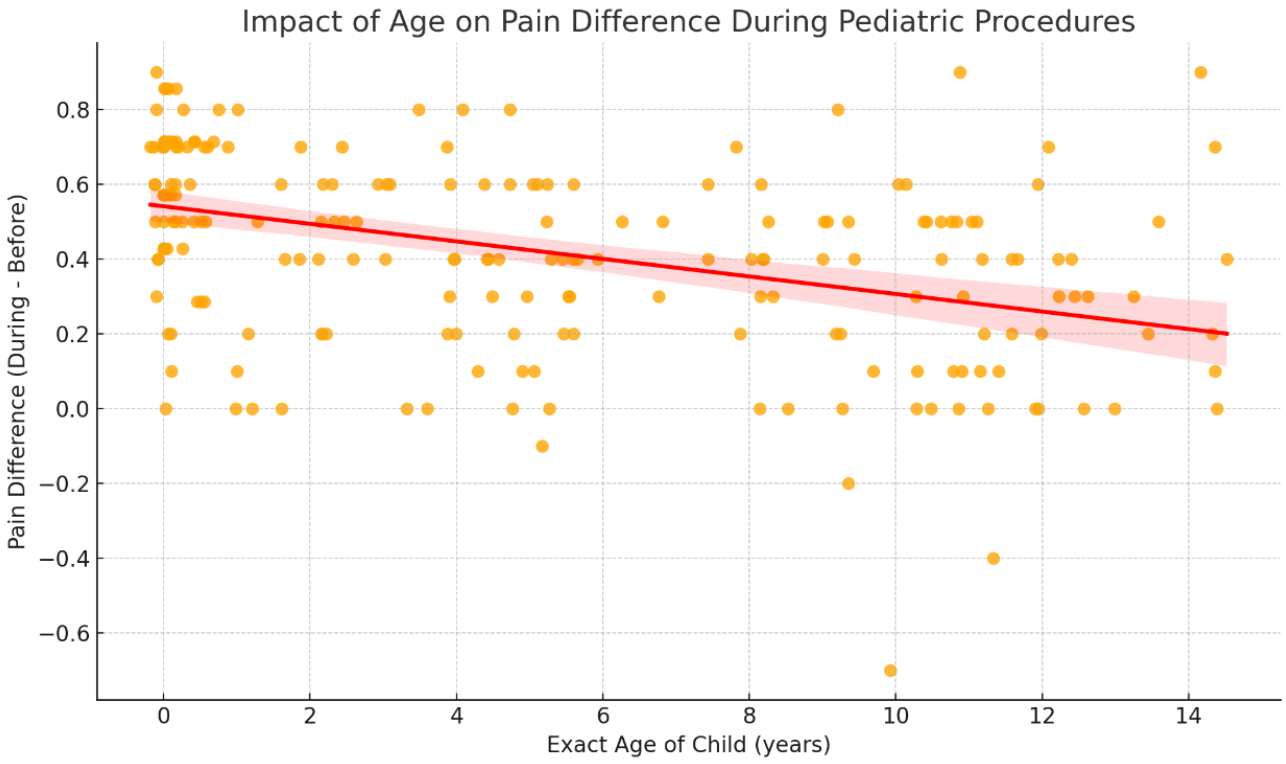

Figure 32: Impact of Age on 'Pain difference' during pediatric Procedures

2. Impact of rural or urban residency :

In comparing pain scores between urban (Marrakech region) and city populations, the mean difference in pain (pain_diff) was 0.200 for urban residents and 0.419 for city residents.

A one sided Mann-Whitney U test, with a U statistic of 88.0 and a p-value of 0.106, suggests no statistically significant difference in 'pain_difference score' between the two groups. However, the relatively low p-value indicates a potential trend, and with a larger dataset, this result may reach significance, providing stronger evidence for a difference.(figure 33)

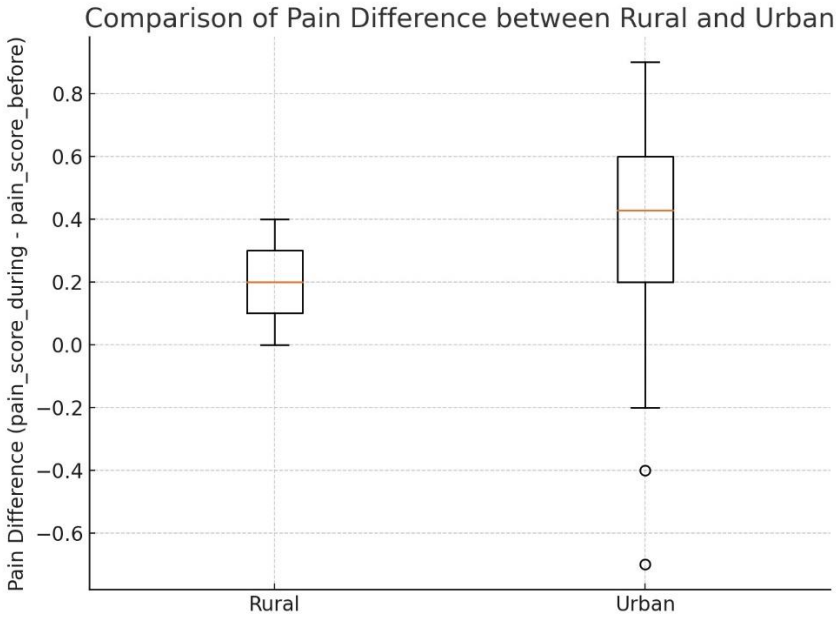

Figure 33: pain score difference by urban or rural

3. Impact of child's gender :

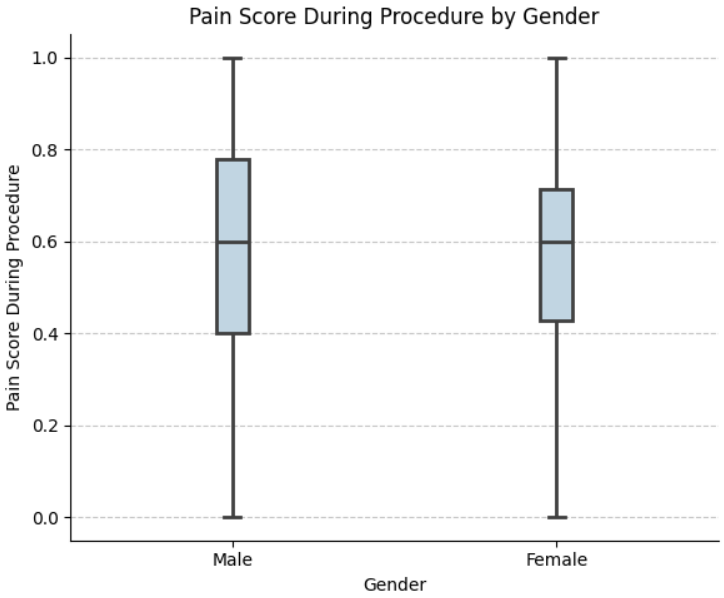

Figure 34 : Pain score During procedure by gender

This study examines the potential influence of gender on pain perception during medical procedures in pediatric patients.

Mann-Whitney U test, compared pain scores recorded during the procedures between male and female children. The analysis found no statistically significant difference in pain scores between the two genders, with a p-value of 0.9418.

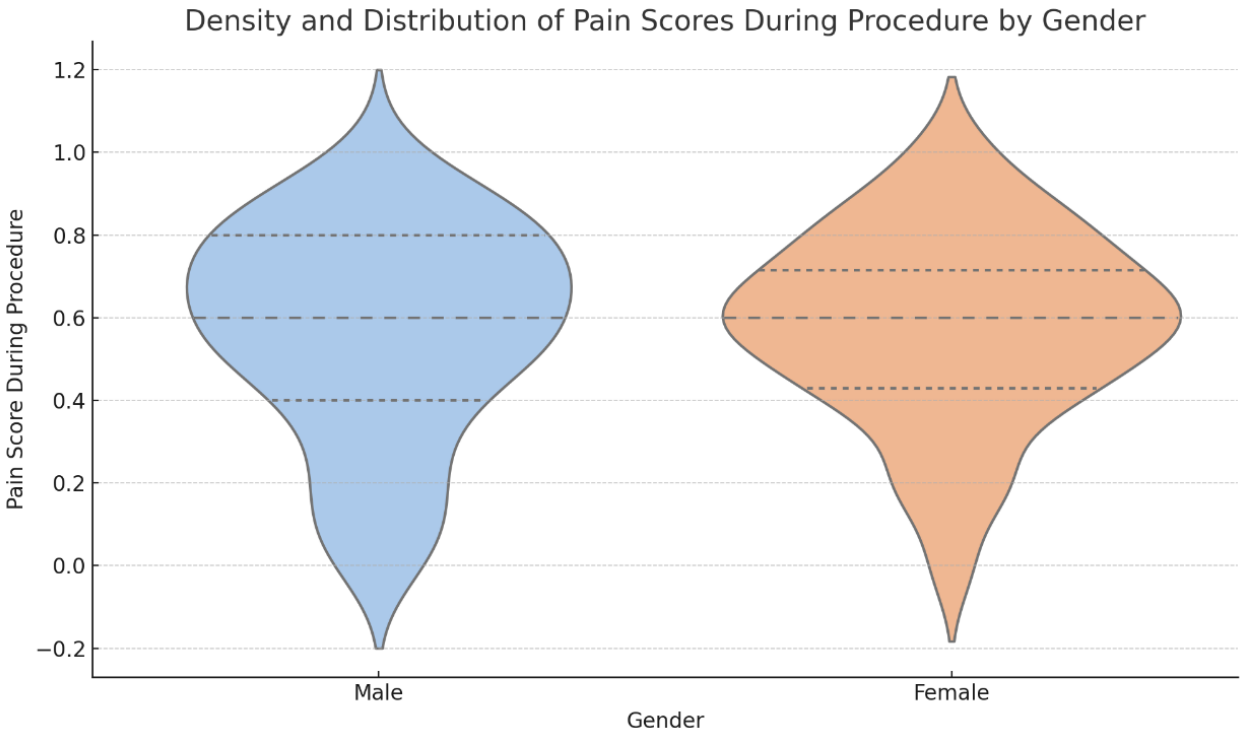

Figure 35 : Density and Distribution of Pain scores During procedure by gender

This result suggests that gender does not significantly impact the level of pain experienced by children during medical procedures (figure 33,34).

4. Impact of chronic medical condition:

This study investigated whether children with chronic conditions perceive pain differently during medical procedures compared to those without chronic conditions.

the Mann-Whitney U test revealed a statistically significant difference in pain perception, with a p-value of 0.0314.

This indicates that children with chronic conditions tend to perceive less pain during procedures than those without such conditions.

The accompanying boxplot visually supports this finding, showing a lower distribution of pain scores for children with chronic conditions (figure 36).

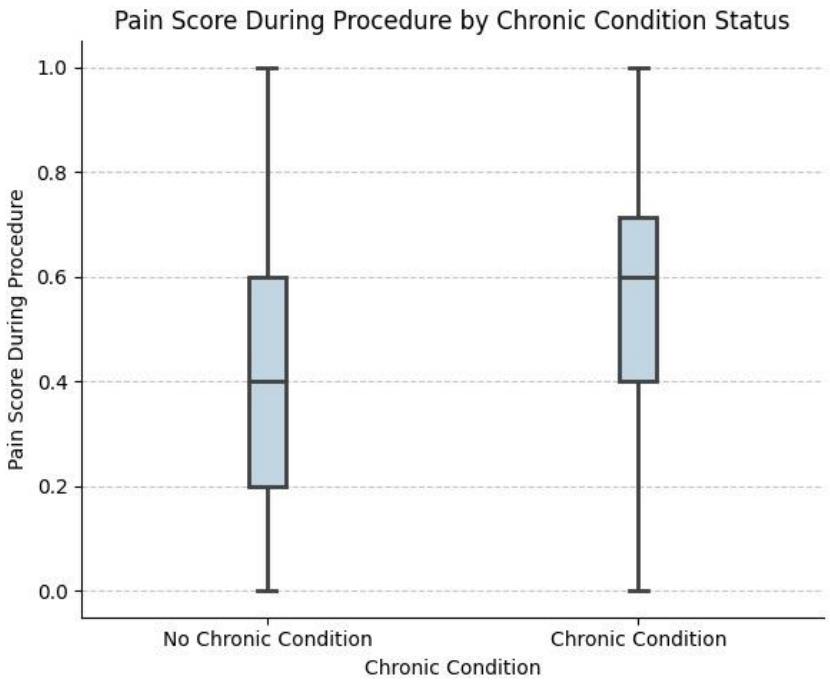

figure 36: Pain score during procedure according to chronic medical condition

5. Influence of "first time procedure" :

This study assessed whether undergoing a procedure for the first time influences pain perception in pediatric patients.

The Mann-Whitney U test revealed a statistically significant difference in pain scores during the procedure between children undergoing their first time procedure and those with previous procedural experience, with a p-value of 0.0430.

This indicates that children undergoing their first procedure tend to experience higher pain levels compared to those who have had prior procedures. The accompanying boxplot visually supports this finding, showing a higher distribution of pain scores for first time procedures.(figure 37)

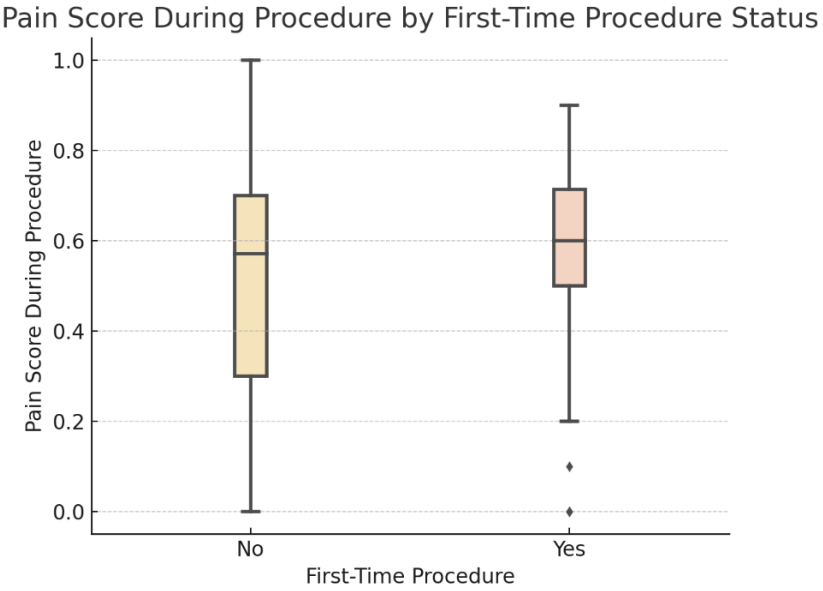

Figure 37 : Pain score during Procedure by first time procedure status

6. Influence of first time 'THIS' procedure :

a. Using 'pain score during' :

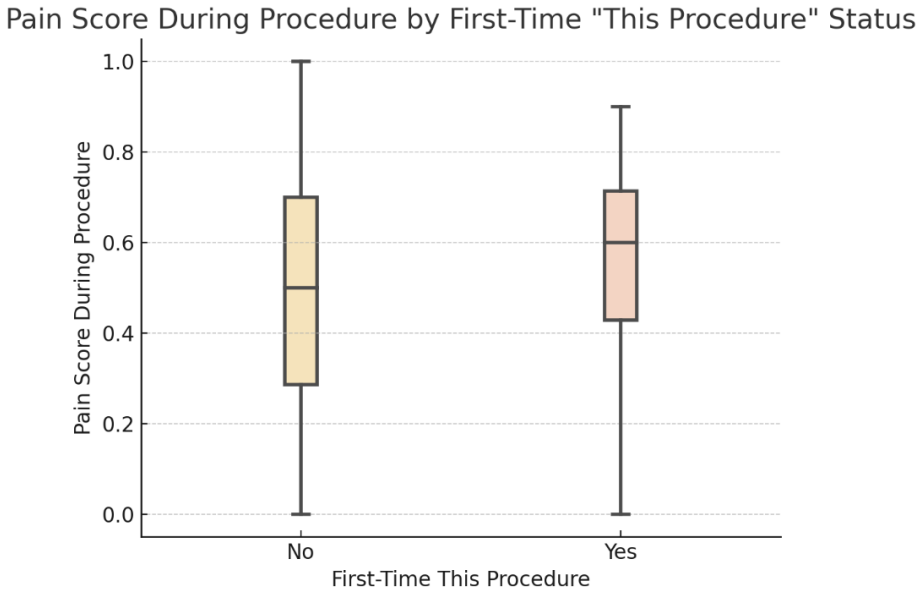

Figure 38 : Pain score during Procedure by first time THIS procedure status

This test examined whether undergoing a specific medical procedure for the first time influences pain perception in pediatric patients.

The Mann-Whitney U test results yielded a p-value of 0.0869, indicating a statistically significant trend, as the value is more than 5% but less than 10%.

This suggests that children experiencing a specific procedure for the first time are likely to experience higher pain levels compared to those who have previously undergone the same procedure. The accompanying boxplot supports this observation, showing a higher distribution of pain scores among first time 'THIS' procedure patients (figure 38).

b. Using 'pain score difference':

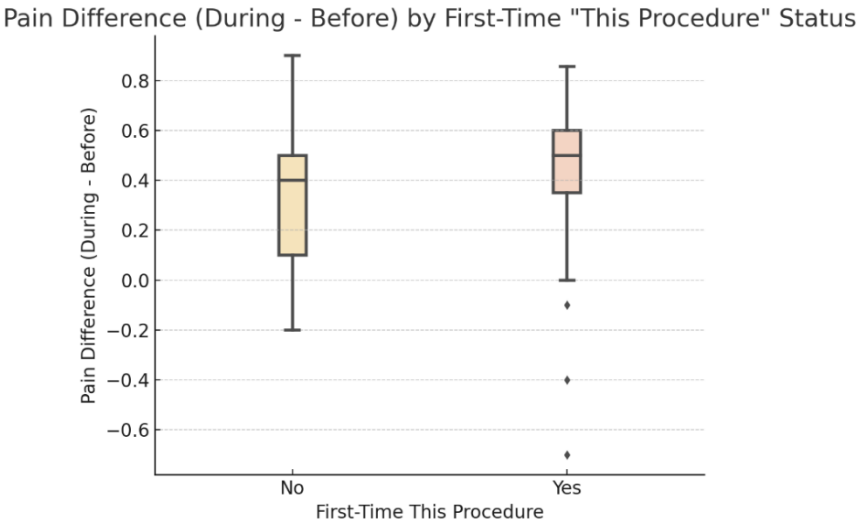

figure 39 : Pain score during Procedure by first time THIS procedure status

This study investigated whether undergoing a specific medical procedure for the first time influences the change in pain perception (pain difference between before and during the procedure) in pediatric patients.

The Mann-Whitney U test results revealed a statistically significant difference, with a p-value of 0.0049, indicating that children experiencing a specific procedure for the first time tend to have a greater increase in pain compared to those who have undergone the procedure before.

The accompanying boxplot visually reinforces this finding, showing a higher distribution of pain differences among first time procedure 'THIS' patients (figure 39).These results suggest that procedural familiarity significantly impacts pain perception, with first time patients experiencing a more pronounced increase in pain.

IV. Parents related factors :

1. Impact of Parent's gender :

a. Using pain score during pain :

The results of the Mann-Whitney U test comparing the 'pain scores during' the procedure based on the presence of either the father or mother are as follows:

U Statistic: 915.5, P-Value: ≈ 0.692.

This analysis confirms that the presence of either the father or mother during the procedure does not significantly influence the pain scores

b. Using pain score difference :

The results of the Mann-Whitney U test comparing the 'pain score difference' based on the presence of either the father or mother during the procedure are as follows:

U Statistic: 858.5, P-Value: ≈ 0.923.

This analysis shows that the presence of either the father or mother during the procedure does not significantly influence the pain difference

Visual Representations (figure 40) :

- **Filtered Boxplot of Pain Score Differences:** This plot illustrates the differences in pain scores for children based on whether the mother or father was present. The distributions and central tendencies are comparable between the two groups.
- **Filtered Boxplot of Pain Scores During Procedure:** This plot displays the pain scores recorded during the procedure for children when either the mother or father was present, revealing similar distributions.

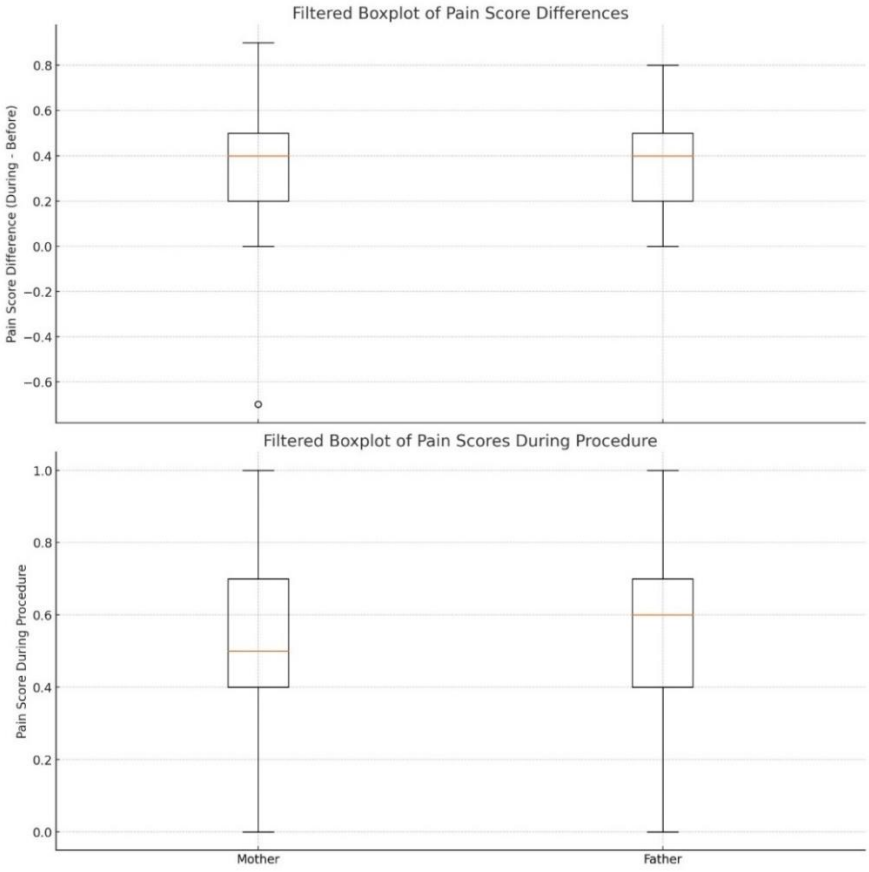

Figure 40 :pain score difference and pain score during according to parent's gender

2. Impact of marital status :

In this study, we investigated the impact of parental marital status on children's pain perception during medical procedures. Specifically, we examined two outcomes: the pain score during the procedure and the pain difference. Statistical analysis was performed using the Kruskal-Wallis test to determine whether marital status influenced these pain-related measures.

The results showed no statistically significant difference in the pain score during the procedure based on marital status (Kruskal-Wallis statistic = 2.123, p = 0.547). Similarly, there was no significant effect of marital status on the pain difference (Kruskal-Wallis statistic = 2.938, p = 0.401).

These findings suggest that marital status does not appear to significantly impact children's pain perception during medical procedures.(figure 41)

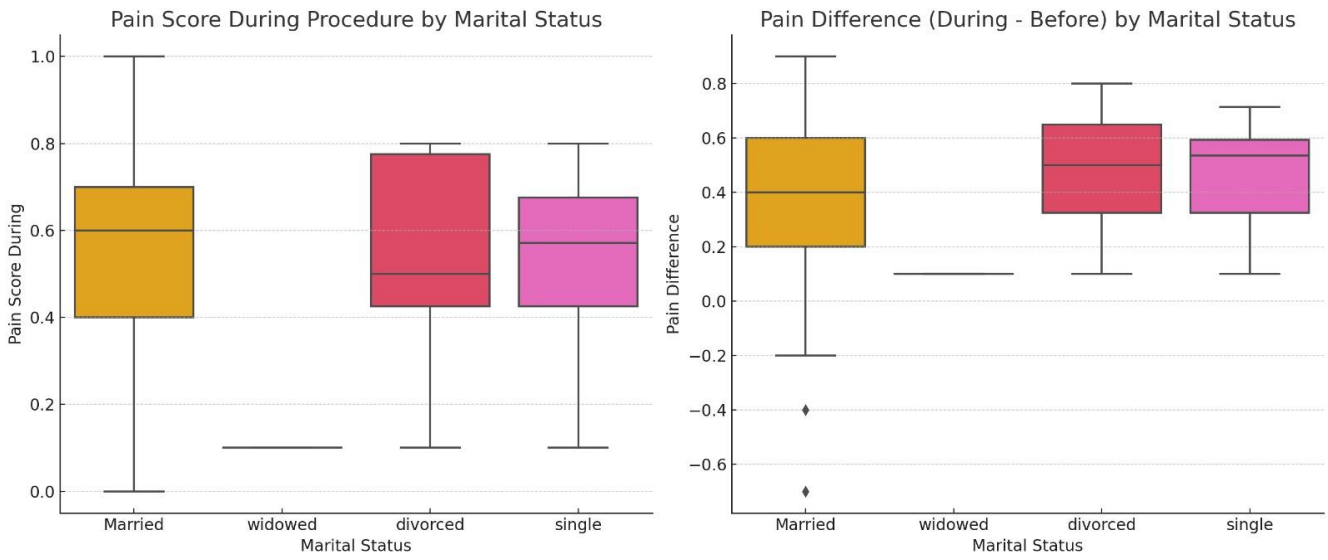

Figure 41: pain score difference and pain score during according to matrimonial status

3. Infuence of time spent with the child :

a. Parent present group :

The Kruskal-Wallis test comparing the impact of time spent with the child on pain differences for the parent present group yielded a statistically significant result with a p-value of 0.017. This suggests that the amount of time spent with the child has a significant effect on changes in pain perception when a parent is present.(figure 42)

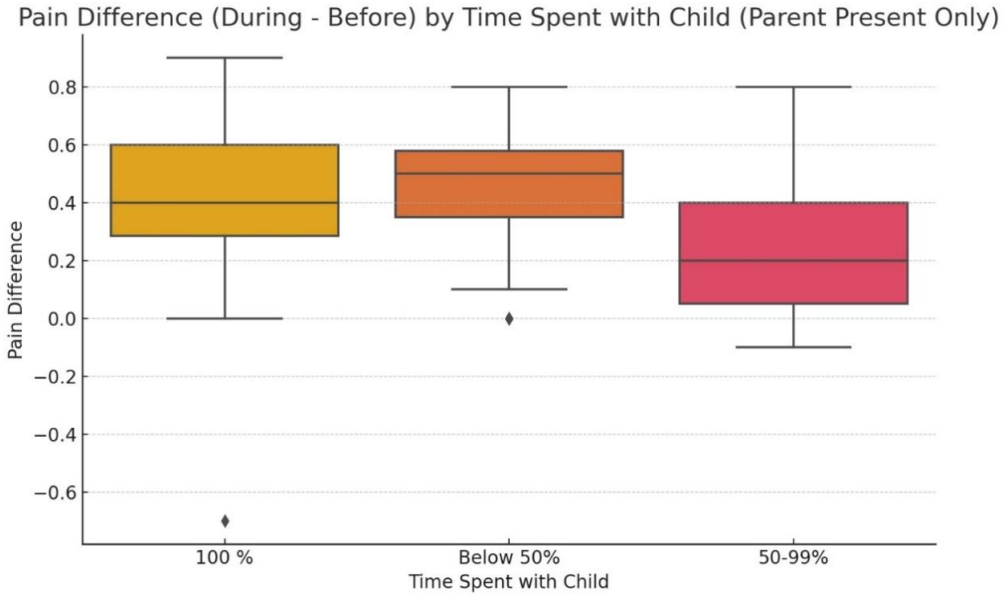

Figure 42: pain score difference by time spent with the child for 'present parent' group

- Children whose parents spend 100% of time with them at home report the moderate pain scores during the procedure (median ~0.4).
- Those with 50-99% parental presence at home report the lowest pain scores (median ~0.2).
- Children with below 50% parental presence at home report highest pain scores (median ~0.5).

This suggests that a balanced parental presence (50-99%) may be associated with the best pain management during procedures, while constant parental presence (100%) might lead to higher pain perception.(figure 42)

b. Parent absent group :

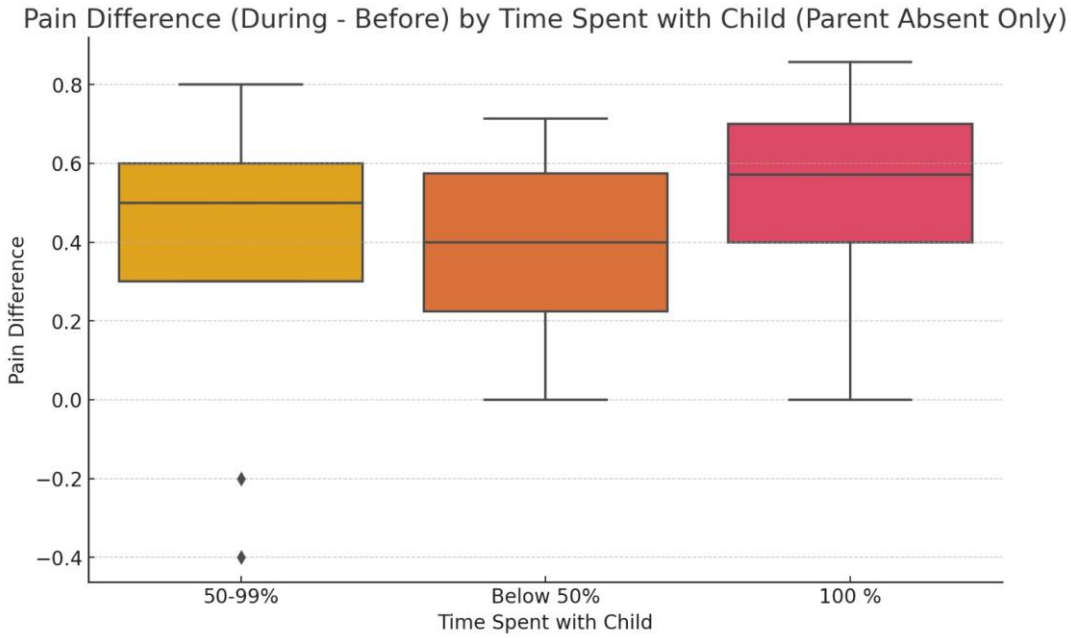

Figure 43 : pain score difference by time spent with the child for 'absent parent' group

The Kruskal-Wallis test across all three groups, Test Statistic: 4.465 and With a p-value of 0.107.

this result is not statistically significant at the 0.05 level. This suggests that there is no significant difference in pain perception across the 100%, below 50%, and 50-99% time categories when a parent is absent.(figure 43)

4. Influence of parents chronic pain history :

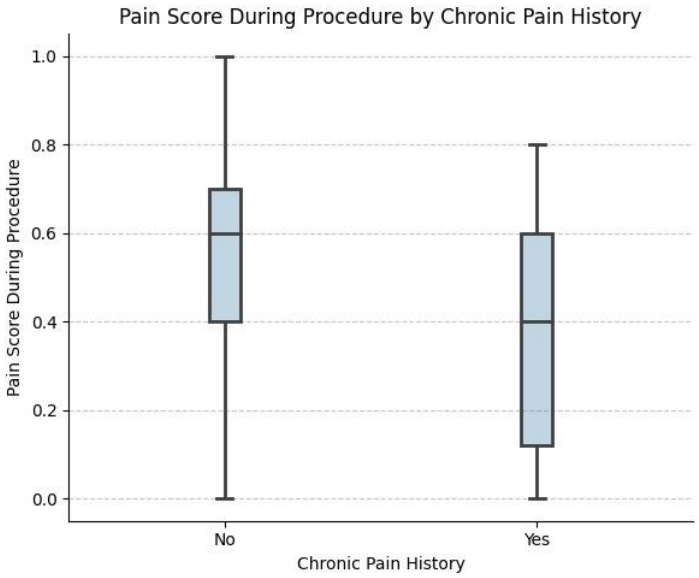

Figure 44 : pain score during procedure according to parental chronic pain history

In this part of the study, we examined whether the presence of a parental history of chronic pain affects children's pain scores during medical procedures.

The Mann-Whitney U test yielded a p-value of 0.008, indicating a statistically significant difference in pain scores between children with parents who have a history of chronic pain and those without.

The results support the hypothesis that children with a parent who has chronic pain experience significantly lower pain scores during the procedure (figure 44).

5. Influence of parent's history of psychological disease :

a. Using pain score during :

In this analysis, we explored the relationship between the presence of a psychological disease history and pain scores during medical procedures. The Mann-Whitney U test yielded a U statistic of 481.0 and a p-value of 0.731, indicating no statistically significant difference in pain scores during procedures for children with versus without a history of psychological disorders.

These findings suggest that psychological disease history does not have a meaningful impact on the pain experienced during medical interventions in this cohort.(figure 45)

b. Using pain score difference

In this analysis, we explored the relationship between the presence of a psychological disease history and the difference in pain scores. The Mann-Whitney U test yielded a U statistic of 661.5 and a p-value of 0.230, indicating no statistically significant difference in the pain difference for children with versus without a history of psychological disorders.

These findings suggest that psychological disease history does not have a meaningful impact on the change in pain perception during medical interventions in this cohort.(figure 45)

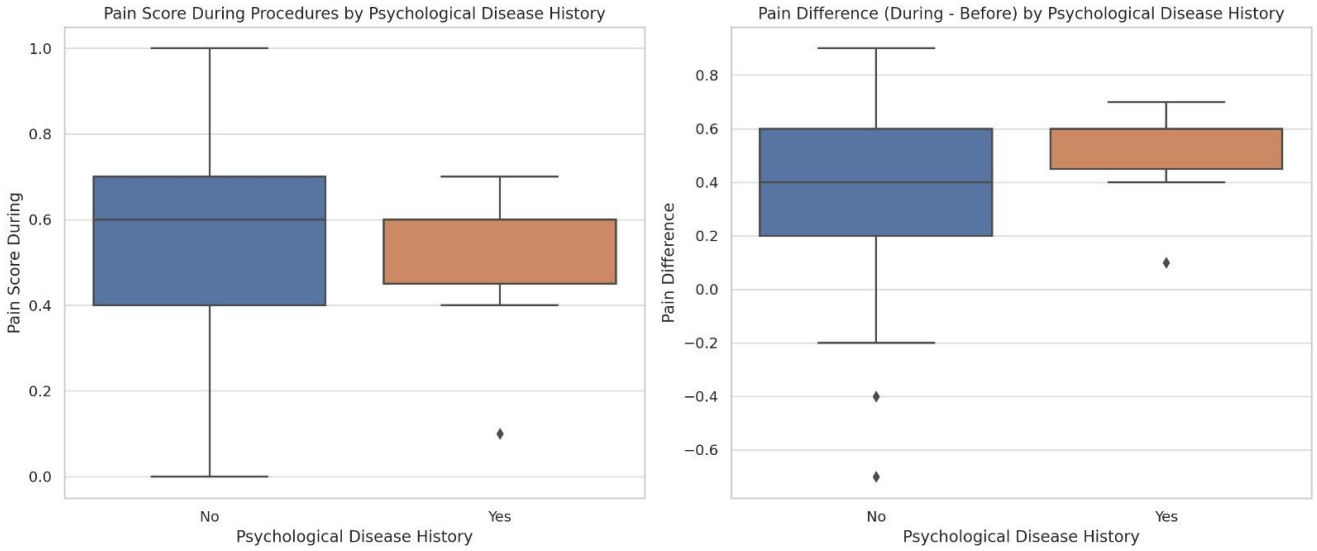

Figure 45 : 'Pain score during' and 'pain score difference' by psychological disease.

V. Healthcare worker related factors :

1. influence of practicioner gender:

a. using 'pain score difference' :

To eliminate the impact of procedural variation and focus specifically on gender, we conducted the study solely on IV cannulation. This allowed us to minimize confounding variables related to different procedures and concentrate on the gender based differences in pain perception or outcomes.:

This study assessed whether the gender of the medical practitioner impacts the change in pain perception in pediatric patients undergoing IV cannulation.

The Mann-Whitney U test results produced a p-value of 0.2529, indicating no statistically significant difference in pain perception changes based on whether the practitioner is male or female.

b. Using 'Pain score during' :

We tested the same hypothesis, using this time, the pain scores during the IV cannulation procedure between pediatric patients treated by male and female practitioners.

The Mann-Whitney U test for this analysis yielded a p-value of 0.2026, also showing no statistically significant difference in the pain scores during the procedure based on the practitioner's gender.

This outcome reinforces the earlier findings that the gender of the practitioner does not significantly affect the pain levels.

2. The impact of duration of experience on parental preference :

The analysis shows that the odds of medical practitioners preferring parental presence during procedures significantly decrease with experience. Logistic regression results reveal that for each increase in experience level, the odds of choosing parental presence decrease by 66% (odds ratio: 0.34, p-value: 0.005). This suggests that more experienced practitioners tend to prefer parental absence. The findings are statistically significant, indicating that practitioner's experience plays a crucial role in decision-making about parental presence.(figure 46)

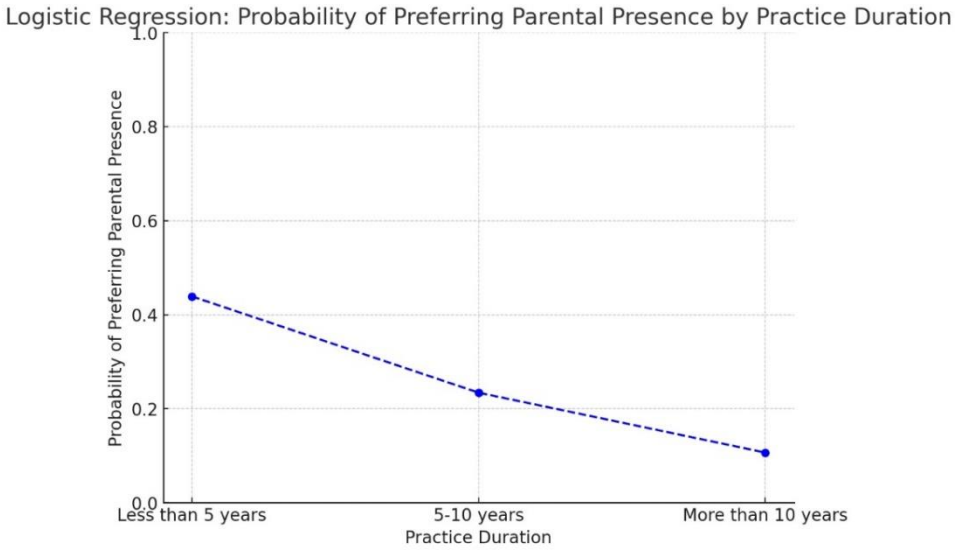

Figure 46 : logistic regression of preferring parental presence by practive duration

Discussion

I. bibliographical review :

1. Definition :

Since Margo McCaffery first defined pain in 1968 [[12]] as “whatever the person experiencing it says it is, and existing whenever they say it does”, the concept of pain has evolved significantly.

The current definition of pain, revised in 2020 by the International Association for the Study of Pain (IASP), states: "An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage." This updated version replaces the 1979 definition, which described pain as "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage." The main change acknowledges that pain can exist even without clear tissue damage, highlighting its complex nature.[[13]]

The revised IASP definition of pain, like its predecessor, faces challenges in capturing pain's full complexity. While it admits pain as a personal and emotional experience, it struggles to integrate cognitive and social factors. This is especially relevant for conditions like chronic or nociplastic pain, where there is no clear tissue damage, and for non verbal populations like infants or animals. These limitations show the inherent difficulty of defining pain in a way that addresses all its biological, psychological, and social dimensions. [[13]]

2. Types :

In clinical practice, key pain classification systems include categories based on anatomy, etiology, intensity, duration, and pathophysiology

2.1 Anatomic :

The Anatomic Pain classification system identifies the specific region of the body where pain is felt. This system is often the first step in classifying pain, helping to localize and assess the affected area for further diagnosis and treatment.[[14]]

2.2 Etiologic :

The etiological pain classification identifies pain by its cause, divided into cancer and non cancer pain. Cancer pain is distinct due to its complexity and intensive treatments, while other causes include injuries, diseases, and surgeries.[[14]]

2.3 Duration :

Acute pain refers to pain that has lasted for less than 3 months, while chronic pain persists for more than 3 months. Subacute pain is a subset of acute pain, defined as pain lasting between 6 weeks and 3 months [[15]].

2.4 Phatophsiology :

We recognize three types of pain based on pathophysiological classification : Nociceptive pain is caused by activated nociceptors due to injury or inflammation, typically acute and localized. Nociplastic pain results from altered nociceptive processing in the central nervous system, often chronic and widespread. Neuropathic pain arises from damage or disease in the somatosensory system, such as in carpal tunnel syndrome or diabetic neuropathy [[16]].

3. Procedural pain definition :

Acute procedural pain refers to the brief pain that infants and children experience during necessary invasive medical procedures, such as diagnostic, therapeutic, or preventative interventions [[17]].

4. pain perception properties according to age groups :

Children perceive pain differently from adults, due to their developing nociceptive system, which is more excitable and sensitive to injury. Their pain also shows greater plasticity, being more influenced by cognitive, behavioral, and emotional factors than in adults [[4]] :

a. Neonates, toddlers and infants :

Neonates are hypersensitive to pain due to their immature nervous system and reduced inhibition of nociceptive signals. Inadequate pain management in neonates can lead to long term effects, including altered neurobehavioral development [[18]]. For toddlers, attention problems were noticed in born preterm [[19]].

b. Preschool children :

It was found that preschoolers were found to remember and communicate their pain experiences. They employ strategies like distraction and physical relief for pain management [[20]]. Children may struggle to differentiate between pain, anxiety, and fear, which can complicate pain perception. [[21]]

c. School aged children :

At this stage Children better understand tangible interventions, especially greater than 7years of age, like applying topical anesthetics for pain relief rather. They are also capable of using pain rating scales and employing self initiated coping strategies such as distraction or guided imagery, enhancing their pain management.[[21]]

d. Adolescents :

During adolescence, pain perception changes due to biological, psychological, and social factors. fluctuations in pain sensitivity are noted, often related to increased hormone levels and brain development. Psychological factors, such as identity formation, emotional challenges and the onset of depression, can also affect pain experiences. Social shifts like peer dynamics and family conflicts play a role in how adolescents perceive and manage pain. These combined factors influence pain perception during this critical developmental stage. [[22]]

5. Pain assessment :

Effective pain management relies on regular assessment of pain's presence and severity, as well as monitoring the patient's response to interventions [[23]],Given the varying communication abilities of neonates, infants, and young children, it is essential to use age appropriate tools for accurate pain assessment. These tools include self reports for older children, behavioral observations, and physiological monitoring for younger or non verbal children [[24]] :

a. Self report pain assessment :

Self reported pain assessment must be prioritized whenever possible for accurate evaluation [[25]]. They are considered the gold standard for children aged 3 and older, as they directly measure pain intensity. Common tools include the Wong Baker FACES, Faces Pain

Scale Revised, Numerical Analogue, and the Adolescent Pediatric Pain Tool. Each tool has its advantages and disadvantages and must be appropriate for the child's age and developmental level to ensure accurate assessment [[26]].

b. Behavioral observational assessment :

When self report is not possible in young or non verbal children, pain is assessed through behavioral observation. Main indicators include vocalization, facial expression, body language, and emotional state, with facial expression being the most consistent. This method is most reliable for acute, short term pain [[24]], it is The primary method of pain assessment for infants and children under 3 years old, validated tools include : CRIES, NIPS, FLACC, CHE-OPS [[27]].

Because behaviors like grimacing and crying aren't always specific to pain, it's important to rule out other causes first. For optimal assessement, Behavioral observations may be paired with self reports or physiological measures, for a more accurate assessment of pain. [[26]]

c. physiological monitoring :

Physiological measures, monitor the body's autonomic responses to pain, are one of the important tools for assessing pain in infants and children. However, factors like medication and stress can affect accuracy, so they should be combined with other assessment methods for reliability [[28]].Physiological parameters such as heart rate, oxygen saturation, blood pressure, and respiratory rate are commonly used, These measures may indicate the presence of pain but cannot quantify it[[29]].

II. Key findings :

The primary objective of this thesis was to assess whether parental presence reduces pain perception in pediatric patients. The results showed a significant reduction in pain perception for newborns and children aged 3 to 6 years when a parent was present during medical procedures. However, in adolescents, parental presence was associated with an increase in perceived pain. This indicates that the impact of parental presence on pain perception is age dependent, with varying effects across developmental stages.

Additionally, several factors were identified that influence pain perception, which were categorized into four main areas: child related factors such as the child's gender, experiencing a medical procedure for the first time, or having a chronic medical condition, parental factors like the history of chronic pain or psychological conditions, and the amount of time spent with the child, healthcare practitioners related factors, including their gender and duration of experience, and procedure related factors, particularly the use of analgesics.

Moreover, the study explored parental and healthcare practitioners preferences regarding parental presence during medical procedures, outlining perceived benefits, potential downsides, and the arguments both for and against this practice.

These elements and factors will be thoroughly analyzed and discussed in detail, point by point, in the following chapters.

III. Comparaison with other studies:

1. Procedual Pain perception and parental presence :

1.1 Overall sample :

According to our findings, parental presence significally reduces pain perception (p = 0.032), on a population of 220 individuals, and a mean age of 4.90 years ±4.66 SD.

A systemic review including articles up to december 2020 and published on 2022, evaluating the same objective, six studies were selected, involving 730 children with age between 0-12 years, 4 studies agree with our findings and two studies found no statistical significant decrease in pain perception. [[30]]

Dilek Sönmez Sağlık et al. [[31]] , on a recent study conducted in Turkey with a sample composed of 111 children, on a more restrained age group raging from 9 to 12 years old, confirmed our hypothesis, the mere presence of a parent can significally reduces pain scores, and thus pain perception (P < 0.001).(table 8)

From a subjective standpoint, a study of 48 children aged 5-12 [[32]] , found no significant differences in demographic factors, operation times, or anxiety levels between groups with and without maternal presence during anesthesia induction. However, salivary cortisol levels, a marker of physiological stress, were significantly higher in the mother absent group after induction (p=0.001) and in the recovery room (p=0.02). This suggests that while subjective anxiety reports were similar, maternal presence may reduce physiological stress, which can not be fully captured by subjective measures .

Table 8 : comparaison of our study and a turkish study about the impact of parental presence in the child Each age cathegory

The study	Year	Country	Sample, MA	Statistical test P value	significance
Dilek Sönmez Sağlık et al.	2018	Turkey	111, 10.37± 1.15	P < 0.001	Statistically significant
Our study	2024	Morocco	220 ; 4.90±4.66 SD	p = 0.032	Statistically significant

1.2 for each age group :

a. 0m -1m :

Our study showed statistically significant decrease in pain perception in this category, (p=0.0822) (p- value threshold of 0.10 to determine significance, which was chosen instead of the conventional 0.05 due to small sample sizes), suggesting that newborns are positively affected by parental presence.

Emilie Courtois et al, [[33]] in The EPPIPAN study found results similar to ours, regarding parental presence reducing pain perception. However, it is nothworthy to cite differences between the two studies. EPPIPAN included preterm neonates and focused solely on venipuncture, while our study excluded preterm neonates to avoid the confounding effects of neurological conditions like cerebral palsy, which is more common in preterm infants [[34]]. Additionally, our study assessed the impact of parental presence across various procedures, which may elicit different pain responses compared to venipuncture alone. (table 9)

The beneficial impact of parental presence, especially that of the mother in neonatal contexts, can be partially explained by research showing that maternal voice effectively soothes both term and preterm newborns during painful medical procedures. This calming effect helps reduce stress and pain responses, making maternal presence during such procedures a valuable component of neonatal care. [[35]]

Moreover, mothers can use skin to skin contact with their newborns, which has been found to reduce pain perception during medical procedures by lowering heart rate and crying time. [[36]]

In conclusion, parental presence reduces neonatal pain primarily through skin to skin contact and voice recognition, both of which have been shown to soothe newborns, lowering their stress and pain perception during medical procedures.

b. 1m – 3 y.o :

In our study, 40 children in this category were surveyed, and statistical analysis revealed no statistically significant difference in pain perception between the groups with or without a parent present.

A study conducted in the USA, [[37]] analysing young children's behavioral responses to painful burn care procedures with and without a parent present, confirmed our findings, no statistically significant difference were perceived between the two groups.(table 9)

It is important to note that, both studies, used a relatively small sample, but the type of procedure is unified and more painful than procedures surveyed in our study, highly painful procedures, may be less influenced by external factors like parental presence because the stimulus is so overwhelming.

Our hypothesis regarding the limited impact of parental presence for children under 3 y.o was further explored by comparing our findings with a third study [[38]],involving more common procedures: IV cannulation and vanipuncture for a larger group pf 72 children. While this study confirmed our results, it included children up to 4 years old, which could interfere with direct comparisons.(table 9)

To Alleviate these challenges, a fourth study [[39]] was subject to comparaison to the previous ones, with a much larger sample 431 of children under 3 years old , and no highly painful procedures : VP, IV cannulation, urethral catheterization, moreover this study included three groups : parental presence, absence and instructed on how to help their children, this study confirmed our hypothesis and found no correlation between parental presence and perceived pain, even with instructed parents.(table 9)

In summary, our study, alongside comparative research, indicates no significant effect of parental presence on pain perception in children under 3 years old, even during common or highly painful procedures (table 9).

These findings may be explained by the developmental immaturity of children under 3, who may react more reflexively to pain and have difficulty distinguishing it from fear or anxiety. This could limit the effectiveness of external soothing, such as parental presence, in reducing their pain perception during procedures.

c. 3y.o - 6 y.o :

According to our dataset, there was a statistically significant difference between the groups with and without parental presence. Children in the parental presence group experienced lower levels of pain compared to those without a parent present during procedures.

This contrasts with a study from China [[40]], where no statistically significant difference was found in pain scores using the same pain scale WBF (3.47±1.38 vs. 3.88±1.16), despite lower scores when parents were present. However, physiological measures such as respiratory rate ($p<0.001$) and heart rate during the procedures ($p=0.003$) showed significant differences, suggesting that self reported pain scales may be more subjective compared to physiological measures.(table 9)

The difference between the findings in our study and the Chinese study may be attributed to the challenges of using self reported pain scales with young children. For this population, self reporting can be difficult as they might not fully express their pain levels accurately. In contrast, physiological measures such as heart and respiratory rates offer more objective assessments of pain. It's also worth noting that we probably, due to our small sample size, had fewer patients under 4 years old, where self report scales may be less reliable, due to limited cognitive abilities, making it difficult for them to differentiate pain intensity and provide reliable, graded responses [[41]].

d. 6 y.o – 10 y.o :

We found no statistically significant difference between the two groups, using the Numeric pain scale, contradicting with another study [[42]], on a relatively narrower age range 7-10, which used similar self reported pain scale, physiological pain indicators : vital signs, and stress scale (The A-State score, A-Trait score), this study documented significant statistcal differences in all the three methods used to compare children's experience of pain.(table 9)

This discrepancy might be due to differences in sample size, the nature of parental interactions in our context, and the perception that older children require less emotional reassurance, potentially reducing the impact of parental presence on their pain experience.

e. 10 y.o – 15 y.o :

Parental presence might increase pain perception in teenage population, according to our study, contraditing with an American study [[43]], teenagers experienced more distress in the parent absent group.(table 9)

In our study, parental presence during painful procedures may have caused feelings of dependence or embarrassment, increasing anxiety and pain perception, as teenagers strug-

gled between seeking support and asserting independence. In contrast, the American study's findings of higher distress in the parent absent group may reflect cultural or psychological differences, where some teenagers felt more vulnerable without parental support.

Another explanation for our findings could be a psychological response where teenagers exaggerate their pain to seek attention, potentially stemming from poor communication with parents. This aligns with findings in an international cross sectional survey involving adolescents from 24 countries across Europe, Canada, and the USA [[44]] , which shows that poor communication with parents is linked to emotional distress in adolescents. Such behaviors may emerge from a need for reassurance and validation in the context of a weak emotional connection at home.

Table 9 : comparaison of our study to different studies according to age range

Age range	The study	Publishing year	Country	Sample(n), Ma(y),SD(y)	Statisti-cal test : p value (%)	Significance (increase or decrease)
0 - 1m	EPPIPAIN2	2011	France	495,0,007y±0,028	0.007	Significant (decrease)
	Our study	2024	Morocco	55, 0.08 y±0.19	0.0822	Significant (decrease)
1m-3 y.o	Doctor ME, et al.	1994	USA	28,--	--	Not significant (does not decrease)
	Bauchner H, et al.	1996	USA	431	--	Not significant (does not decrease)
	Tantikul C, et al.	2014	Thailand	72,--	--	Not significant (does not decrease)
	Our study	2024	Morocco	40, 1.54 y±1.79	0.1296	Not significant (does not decrease)
3-6 y.o	Ozcetin M, et al.	2011	China	135, 4.19±1.23 y	0.089	Not significant (does not decrease)
	Our study	2024	Morocco	43,4.48 y ±1.06	0.0796	Significant (decease)
6-10 y.o	Vasiliki Matziou, et al.	2013	Athens	130, 8.33±1.12	p<0.001	Significant (decrease)
	Our study	2024	Morocco	30, 8.20 ±1.26	0.4004	Not significant (does not decrease)
10-15 y.o	Wolfram RW, et al.	1996	USA	130, 12.3 y±2.8 yr	P < 0.04	Significant (decrease)
	Our study	2024	Morocco	50,11.44 y±2.24	0.0563	Significant (increase)

2. Factors impacting pain perception :

2.1 Child related factors and pain perception :

a. Child's gender impact :

Our dataset analysis and statistical tests revealed no significant difference in pain perception between male and female participants, concluding that gender is not a significant factor in influencing pain perception during medical procedures.

A systematic review and meta-analysis of 18 studies by Katelynn E. Boerner et al. on experimental pain (cold pressor, heat pain, and pressure pain) in children aged 0–18 years, similarly found no significant differences between genders, particularly in children under 12 years. However, a meta-analysis of adolescents over 12 years indicated that girls reported higher pain intensity than boys during cold pressor tasks [[45]].This finding is strongly related to the onset of pubertal changes and their impact on pain perception.

Onella Athnaiel et al. in a recent study conducted in 2023 supports this, showing that rising testosterone levels are associated with an increased pain threshold, while fluctuations in estrogen are linked to heightened pain intensity and perception. [[46]].

In our study, we analyzed a sample of 220 children, with only 50 participants aged between 10 and 15 years (mean age of 11.44 years $\pm$2.24 SD). This suggests that the majority of the population was minimally influenced by pubertal hormonal changes, which can further explain the lack of significant differences in pain perception between boys and girls.

b. Overall pain perception correlation with age :

In our study, regression analysis revealed a significant inverse relationship between the child's age and pain scores during the procedure. Specifically, for each additional year of age, pain perception decreased by 0.0192. It is important to note that the pain score was standardized on a scale from 0 to 1, with a median value of 0.6.

To further explore the relationship between age and pain threshold, an experiment was conducted with 115 children aged 5 to 18 y.o. Pressure pain was applied to the tibia, and participants indicated when they first felt pain. Younger children were asked when it "hurts a lit-

tle" to reduce distress. The results aligned with our findings, showing that pain threshold increases with age. [[47]]

Another study conducted by M. A. Duarte at al. [[48]] using a similar method applied pressure pain at a rate of 0.5 kg/cm²/s across 17 body areas in participants aged 5.3 to 15.8 y.o. It further supported our findings, confirming a direct relationship between age and increasing pain threshold.

c. Exisistance of chronic medical condition or previous medical procedure experience :

In our population, 15.9% of children had chronic conditions, with a significant difference in pain perception ($p = 0.0314$), as they reported less pain than those without chronic conditions. Additionally, children undergoing their first procedure reported higher pain levels compared to those with prior experience ($p = 0.0430$).

A recent cross sectional study by Bisogni et al. [[49]] at an Italian hospital with 230 children (ages 4-12 y.o) found that those with chronic conditions had a lower pain threshold and higher pain perception ($p<0.00001$) than their peers, as measured by the Wong Baker Faces Scale and the Observation Scale of Behavioral Distress. This contrasts with commun assumptions and our findings, where children with chronic conditions are believed to perceive less pain.

This conflict in findings may be explained by differences in how chronic conditions and repeated painful procedures impact pain perception. In our study, desensitization or habituation to pain from repeated procedures could account for the lower perceived pain, as detailed by Bingle et al. [[50]],who highlight the neurological implications of repeated pain stimuli. Their findings indicate that increased antinociceptive activity, initially induced by repetitive painful stimuli, leads to a higher pain threshold.

Whereas, psychological and emotional impact of repetitive medical procedures is highlited in Bisogni et al. Study, and related to anticipatory anxiety as a negative emotion that can potentially modulate pain perception, further defended by Kenntner-Mabiala, R. et al. [[51]]

von Baeyer, Carl L. et al. [[52]] summerizes the consequences of remembered pain in children in four ways: 1.Habituation, where children become less sensitive to milder pain over

time, more common in older children, 2. Sensitization, an increased sensitivity to pain, often seen in younger children after severe pain, 3. No change, where the pain intensity remains constant over time, and 4. No pattern, where responses to pain remain unpredictable, varying among the possibilities mentioned above.(figure 47)

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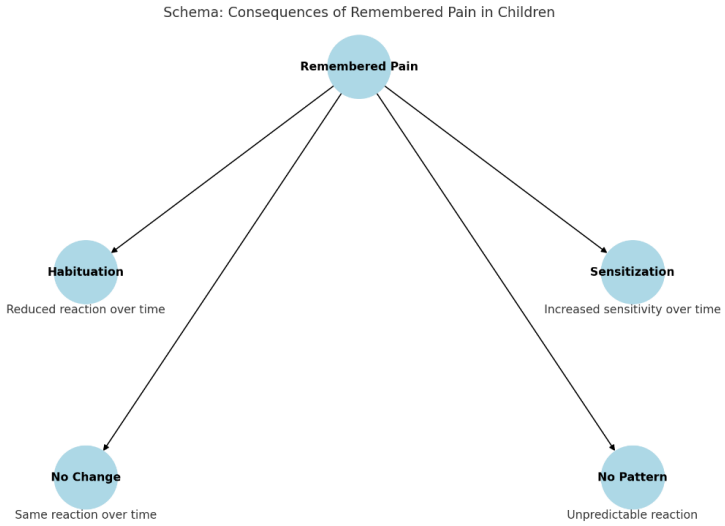


Figure 47 : consequences of remembered pain

In conclusion, it is challenging to predict children's reaction to repetitive painful stimili, neverthless it is strongly suggested that with severe pain, sensitivity is more likely to occur, whereas for milder pain habituation can take place.

This study plays a crucial role in explaining the significant discrepancies between our findings and those of Bisogni et al. In addition to the results, environmental and ethnic differences should also be considered as potential contributing factors to these variations.

d. Impact of urbain rural residency on pain perception :

No statistical signifcant difference was founds (p =0.106), although, we report considerable difference in pain scores: 0.200 for urban residents and 0.419 for city residents.

Studies indicate that children from rural backgrounds often report higher pain levels than their urban peers [[53]], contrary to popular belief[[54]]. Rural areas typically face lower socioeconomic conditions, which can worsen health issues, contribute to greater disability from pain, and elevate pain perception [[55]].

Our findings may be explained by cultural factors, as attitudes and beliefs about pain in rural communities may differ, influencing how pain is perceived and reported.

2.2 Parent related factors and pain perception :

a. Influence of parental chronic pain history :

According to our dataset and statistical tests, there is a statistically significant difference in pain scores between children with and without a parental history of chronic pain (p-value of 0.008), suggesting that children of parents with chronic pain report significantly lower pain scores during procedures, a result that stands against the expected hypothesis.

Parental modeling in children's behavior is a crucial area of research due to its impact on pain perception, as investigated by Julie E. et al. [[56]],Using the cold pressor task, the study explored how maternal facial expressions affect children's pain perception. It found that children's pain thresholds decreased when their mothers exaggerated pain responses. Notably, this study focused only on mothers.

In contrast, another study by Katelynn E. Boerner and all. [[57]]explored potential sex differences by employing four dyads (equal father-son, father-daughter, mother-son, and mother-daughter dyads) using the same cold pressor test (CPT). The findings confirmed the initial hypothesis, additionnaly,revealing that children with a mother reported more intense pain at its worst and higher average pain levels compared to those with a father. Nevertheless, the main premise regarding parental modeling influence on pain perception remains well supported.

In our findings, the reduced pain perception in children of parents with chronic pain may result from learned coping mechanisms through parental modeling. Observing their parents manage chronic pain likely teaches these children strategies that decrease their sensitivity to pain during procedures, emphasizing the influence of parental behaviors on children's pain responses.

b. Impact of history of psychological disease :

According to our dataset, there is no statisctical significant difference in children’s pain perception according to the existance of parental history of psychological disease or not .

Recent study, found that parental anxiety significantly influences children's perception of pain during intravenous cannulation, with 52% of parents experiencing moderate to extreme anxiety. A positive correlation was identified between parental anxiety and children's pain intensity [[58]].

In our context, psychological diseases remain highly stigmatized, which could explain the lack of a statistically significant difference in children's pain perception based on parental history of psychological disorders. Many parents may not disclose their mental health conditions due to societal stigma, leading to underreporting.

c. Impact of parent's gender on pain perception :

Based on our dataset and statistical analysis, there is no statistical significant difference in recorded pain scores according to weither the present parent is the mother or the father.

A study conducted by Erin C. et al. [[59]] evaluated differences in verbal behavior between mothers and fathers during interactions with their children (aged 8–12 years) undergoing the cold pressor task (CPT). The study categorized verbal communication into two types: attending talk (focused on the child's pain) and non attending talk (not focused on the child's pain). Each child underwent the CPT twice, once with the mother and once with the father present in a counterbalanced order.

Results indicated no statistically significant difference between mothers and fathers in the frequency of attending or non-attending talk. However, attending talk was found to be associated with increased pain perception, while non-attending talk was linked to a reduction in pain perception.

Thus, these findings collectively suggest that it is the nature of the verbal interaction specifically, whether the parent's communication centers on the child's pain that may critically influence pain perception, rather than the parent's identity as mother or father, Which aligns with our finding.

Both our findings and the study by Erin C. Moon et al. show that parental gender doesn't significantly affect children's pain perception. Instead, the focus of verbal communication whether focused on the child's pain (attending talk) or not (non-attending talk), plays a more critical role, shaping the child's pain experience.

d. Impact of time spent with the child :

Our test showed a statistically significant difference in pain perception based on the time parents spent with their child. The highest pain scores were observed when parents

spent less than 50% of their time with the child, followed by 100% presence, while the lowest pain scores were for parents spending between 50% and just under 100%.

Study shows [[60]]Spending more time with children enhances their well-being, with both frequency and quality of interactions playing key roles. Quality time fosters better emotional support, stronger relationships, and contributes to children's happiness and development.

Spending balanced quality time with children strengthens the bond and has a positive impact during medical procedures, helping to reduce anxiety.

2.3 Medical practionner related factors :

a. Medical practionner's gender :

In our study, no statistically significant difference was observed in children's perceived pain based on the gender of the medical practitioners. We initially expected different outcomes, assuming that female practitioners might generally be more tender and compassionate, as highlited in a article [[61]], stating that female practionners have longer consultations, are more patient centred, engage in more emotionally focused talk, counsel more psychosocially.

However, it's important to note that a large portion of the data was collected in the emergency department, a highly stressful environment that can challenge practitioners ability to maintain patience and compassion.

b. Medical practionner duration of practice :

According to our dataset, The analysis reveals that the likelihood of medical practitioners preferring parental presence during procedures significantly decreases as their experience increases.

Contrary to our expectations, more experienced healthcare workers tend to prefer parental absence during procedures. This may be attributed to traditional concepts held by older, more experienced practitioners. In contrast, younger practitioners, regardless of their level of experience, appear to be more aware of the importance of parental presence during medical procedures.

2.4 Procedure related factor : Analgesia usage

In our study, the use of analgesia was notably limited, with only 20 out of 220 (9.1 %) cases reporting its application. The majority of these instances involved the use of topical analgesia, primarily during suturing procedures.

Furthermore, we observed the absence of non-pharmacological analgesia in the newborns within our sample, despite evidence from multiple studies showing its effectiveness in reducing pain intensity during procedures.[[62]]

Untreated pain in neonates can lead to long-term consequences, such as altered neuronal pain circuitry and increased sensitivity to pain later in life. Timely and effective pain management is crucial to prevent these changes in the developing pain pathways, which can persist into childhood or beyond.[[63]]

In a recent study, it was noted that most children and adolescents (74%) reported experiencing pain relief through the use of analgesics, while 58% found non-pharmacological methods to be helpful in managing their pain.[[64]]

3. Parental presence : between proponent and opponent :

3.1 Parents position :

a. Parental preference regarding parental presence :

In our study, we focused on commonly performed medical procedures that parents were already familiar with, in order to minimize refusals to attend procedures due to concerns about procedural invasiveness. This choice supports our primary research objective: examining the impact of parental presence on children's pain perception during medical interventions. Ensuring as well, that observed effects were mainly due to parental presence rather than the procedures themselves.

As supported by two studies, A reverse relationship was found between the perceived invasiveness of medical procedures and parental willingness to be present, as shown in a survey of 400 parents in an emergency department [[65]]. A second study in Argentina, involving 172 caregiver surveys in a hospital, confirmed that parents and caregivers are less likely to stay during highly invasive procedures, likely due to emotional distress [[66]].

In our study, 74.5% of caregivers preferred to be present during their child's medical procedures, while 25.5% opted to be absent, indicating a strong parental preference for in-

volvement. In contrast, another study [[67]] found 53% of parents wished to stay, while 47% were reluctant to do so. This comparison highlights differences in parental preferences for being present during pediatric interventions, though parents generally prefer to be involved.(table 10)

Table 10 : comparaison caregivers preference regarding parental presence

Study	Country	Year	Prefer to be present (%)	Prefer to be absent (%)
Nur Amal et al.	Malaysia	2021	53	47
Our study	Morocco	2024	74.5	25.5

b. Parents arguments justifiying their presence :

After adjusting the percentages so they sum up to 100% for a better comparaison , the distribution is as follows:

Reducing the child's anxiety: 28.9% ,Understanding the procedure and asking questions: 23.1% , Reducing their own anxiety: 20.6%, Assisting healthcare workers: 19.3%, Building trust with healthcare workers: 7.9%, Compensating for the mother's absence: 0.19%.

Nur amal et al. [[68]] found similar results to our study in a cross-sectional descriptive study, utilizing a self administered questionnaire completed by the parents, that the main reason to attend medical procedures is to releave their child's anxiety. Understanding the procedure was also a concern of mothers interview in a swedish study [[69]].(table11)

Furthermore, on the parental side, in a recent study published on 2023, it was found that present parents feel less anxious compared to absent parents before the procedure[[70]], another study [[71]] focused on parental anxiety measured 10 mins after the procedure, using the state trait anxiety inventory (STAI), added to the previous finding that present parents felt less anxious compared to absent parents.

Thus, in conclusion, it is very likely that allowing parents to stay beside their child reduced their overall anxiety as it is documented in our study.

Table 11 : comparaison of main motivations of parents to be present during medical procedures

Study	Year	Country	Primary Reason (Reducing Child's Anxiety) (%)	Assisting Healthcare Staff (%)	Building Trust/Assuring Competence (%)
Nur Amal et al.	2021	Malaysia	56.3	14.1	3.1
Our study	2024	Morocco	28.9	19.3	7.9

Before comparing our findings, it is crucial to pinpoint methodological differences between the two studies. We used multiple choice format, providing a more nuanced understanding of parental motivations, allowing parents to select multiple reasons for their presence. In contrast, in Nur Amal et al.'s, it was opted for single choice question, capturing only the most prominent reason for each parent.

In our study, 19.3% of Moroccan parents cited assisting healthcare staff as a motivation, suggesting a cultural expectation of active involvement in the care process. In contrast, Nur Amal's study found that 56.3% of Malaysian parents primarily focused on reducing their child's anxiety, likely due to the single choice format, highlighting emotional support as their dominant concern. Additionally, 7.9% of Moroccan parents expressed the need to build trust or ensure healthcare competence, reflecting concerns about the quality of care, whereas only 3.1% of Malaysian parents shared these concerns, indicating greater trust in the healthcare system.(table 11)

c. Parents arguments justifiying their absence :

After adjusting the percentages so they sum up to 100% for a better comparaison , the distribution is as follows :

The main reason is the Inability to witness the child's pain or distress: 46 responses (adjusted to 59.7%),General fear and anxiety: 23 responses (adjusted to 29.9%), Previous negative experiences: 11 responses (adjusted to 14.3%), Practical constraints (time): 4 responses (adjusted to 5.2%), Tight schedule limitations: 2 responses (adjusted to 2.6%).

Whereas, Nur Amal et al. Study found only 15.6% (10 responses) choosing the inability to witness the child's pain as an argument justifing their absence. The rest of the factors are unique to each dataset. (table12)

Table 12 : Comparison of the main concerns motivating parent's absence during medical procedures

Study	country	Year	Inability to witness the child's pain
Nur Amal and others	2021	Malaysia	15.6% (10 responses)
Our study	2024	Morocco	59.7% (46 responses)

The discrepancy between the two studies may be explained by the difference in survey methodology. Our study allowed participants to select multiple reasons for refusal using a QCM format, In contrast, Nur Amal et al.'s study employed a QCU format, limiting responses to one choice, resulting in a lower frequency for the same concern (15.6%). This methodological variation allowed for a broader expression of concerns in our data.

Nur Amal's research emphasized trust in health professionals and parental roles, while our study focused more on emotional factors like anxiety and prior negative experiences.

3.2 Medical practionners position :

a. Medical practionners preference regarding parental presence :

We conducted interviews with medical practitioners, including nurses, residents, medical trainees, and nurse trainees, regarding their preferences for parental presence during medical procedures. The findings revealed that 56.5% (n=48 responses) prefered parental absence, while 43.5% (n=37) favored parental presence. It is important to note that responses were linked to specific patient cases, resulting in potential repetition from the same practitioner who performed procedures on different days.(table6)

In comparaison, a spanish study [[72]], The majority of professionals (72%, n=164) believed that parental presence during procedures was unnecessary and preferred to perform without it, while 28% (n=53) considered it necessary.(table 13)

On a similar note, a study published on 2018, conducted in Singapore, Physicians and nurses in the ED were given separate self administered questionnaires, most of them agreed to perform medical procedures in absence of parents [[73]]

Table 13 : comparaison healthcare workers preferences regarding parental presence

Study	Year	country	Prefer parental presence (%), n	Prefere parental absence (%), n
Laura Palomares González et al.	2023	Spain	28 (53)	72 (164)
Peter Wong et al.	2019	Singapor	17.09 --	82, 91--
Our study	2024	Morocco	42.5 (37)	57.5(50)

b. Medical practionners perceived benefits of parental presence :

According to our findings, the most highly rated benefits can be categorized into child related and parent related factors. The primary child related benefit, the most frequently cited, is enhancing the child's stillness and calmness during procedures, followed by facilitating communication with the child. The main parent related benefit is encouraging parental involvement.

Likewise, a prospective study conducted on 2023 [[74]], interviewed physicians, on the same matter, and it was found that 87 % think that parental presence was importat to manage the child's behavior, and 95 % expressed that parental presence gave them the opportunity to explain and educate parents during the procedure, besides reducing their anxiety.

These results underscore the triple perceived benefits for both child and parent, as well as the positive impact on the overall medical process, and thus helpful for the medical practionner.

c. Medical practionner perceived inconveniences :

The challenges identified in our study regarding parental presence can be categorized into four main areas: disruption of the procedure, parental specific concerns, practitioner psychological comfort, and child related factors. A comparison with similar studies, including the

2023 Spanish study (Laura Palomares González et al.) and the study by Wong et al. (2019), offers valuable insights into the varying perceptions of parental presence across different contexts. (Table 14)

- **Parental Interference :**

In our study, 85.1% of practitioners identified parental interference as a significant issue, compared to only 22% in a Spanish study, suggesting it's more disruptive in our context. Additionally, 4.6 % reported incidents of parental misjudgment and criticism, which was not addressed in other studies. These findings indicate that while parental presence can be beneficial, it is often viewed as an obstacle to procedural efficiency in our setting.(table14)

- **Parental Specific Concerns :**

Our study found that 46% of practitioners were concerned about the risk of parental fainting during procedures, aligning with the Spanish study, where 35% shared similar concerns. The higher percentage in our study suggests greater awareness of the potential physical and emotional impact on parents in this context.(table14)

- **Practitioner Performance Anxiety :**

Our study found that 34.5% of practitioners experienced performance anxiety due to parental presence, consistent with Wong et al.'s findings, where over 75% of both physicians and nurses reported added stress. These results underscore a common challenge across healthcare settings: parental presence can increase pressure on medical staff, potentially affecting their performance during procedures.(table14)

- **Child-Related Anxiety :**

In our study, only 1.1% of practitioners believed that parental presence increased child anxiety, contrasting with 37% in the Spanish study. This difference may reflect varying perceptions or expectations about parental roles during medical procedures, indicating that the emotional impact of parental presence on children is viewed differently across regions.(table14)

- **Time and Efficiency :**

Our study found that 59.8% of practitioners reported that parental presence increased the time needed for explanations, complicating procedural efficiency. This aligns with Wong et

al. study where both physicians and nurses noted that parental presence extended procedure times and hindered efficiency. These findings highlight the practical challenges parental presence can introduce, despite its potential benefits.(table14)

Table 14 : Comparison of Primary Inconveniences Related to Parental Presence During Pediatric Procedures: Our Study, Palomares González et al. (2023), and Wong et al. (2019)

Study	Country	Year	Parental Interfere-nce	Time to explain and answer questions	Parental fainting	Performance anxiety	Increase child anxiety
Peter Wong et al.	Singapore	2019	--	44.5% physicians70% nurses	--	83.4% physicians 75.7% nurses	--
Laura Palomares González et al.	Spain	2023	22% (n=49)	--	35% (n=80)	--	37% (n=83)
Our study	Morocco	2024	85.1% (n=74)	59.8% (n=52)	46% (n=40)	34.5% (n=76)	1.1% (n=1)

A graphical presentation was chosen to compare the main concerns regarding parental presence during pediatric procedures across different studies (figure 48) :

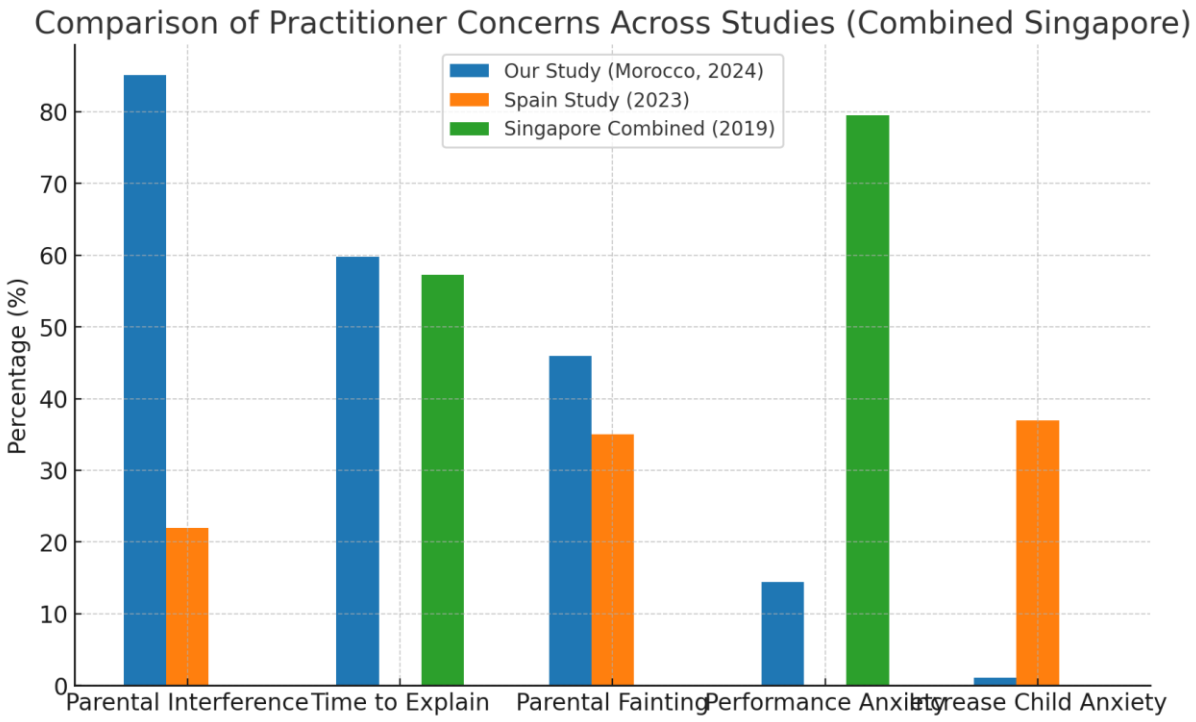


Figure 48 : comparison of key inconvenients related to parental presence.

In our Moroccan study, parental interference (85.1%) was the primary concern, underscoring strong family involvement during procedures. In contrast, the Singapore study by Wong et al. highlighted performance anxiety (79.6%) as the main issue, probably due to high pressure environments in their healthcare system. In the Spanish study by Palomares González et al. child-related anxiety (37%) was a notable concern, reflecting the emphasis on emotional responses in pediatric care. In Morocco, only 1.1% reported child anxiety, indicating a greater focus on procedural efficiency over emotional responses.

This comparison reveals how each healthcare system's expectations and cultural dynamics shape practitioners perceptions of parental presence. The graphical representation (figure 48) provides a clear understanding of how these concerns vary between countries, explaning how parental presence in medical procedures is perceived differently across the world.

IV. Strengths and limitations :

1. Strengths :

The strengths of this thesis lie in its exploration of a nuanced, dualistic issue: whether to encourage parental presence during medical procedures. It does not only verifies the hypothesis that parental presence may reduce pain perception in Moroccon context, but also investigates parental impact within five subgroups of children, respecting each age range's specific characteristics.

Additionally, it explores the prevalence of analgesic usuage for procedural pain in our hospital context. Our study investigates factors primarily related to the child, parent, and medical practitioner triangle and their impact on pain perception.

Moreover, our study provides a comprehensive view by profiling both parents and medical practitioners perspectives to understand differing viewpoints. While other studies focus either on assessing preferences or evaluating pain perception and its related factors, our research integrates both parties. This dual approach enables a deeper understanding of the topic, facilitating optimal pain management.

2. Limitations :

The challenges of this thesis mainly stem from its focus on Marrakech's population, with data collected from the Mohammed VI public hospital center, excluding private hospitals and other regions in Morocco. Expanding the study to different hospitals would help generalize the findings. Additionally, while the study evaluates five subgroups of children, larger sample sizes for each group could provide deeper insights.

Assessing pain in preschoolers is particularly difficult due to communication limitations, and while behavioral assessments were used, incorporating physiological measures would have been ideal but challenging in our context, because it requires multiple observers to monitor the child's immediate reactions to pain simultaneously. Capturing the nuances of procedural pain in real time, especially in an emergency department setting, demands precise coordination among observers to ensure accurate data collection. The complexity of managing both behavioral and physiological observations concurrently makes this approach difficult to implement.

V. Future Implications and Research Directions :

We recommand Expanding the Study Scope by including data from multiple hospitals across Morocco, incorporating private healthcare settings. This would allow for a more generalizable understanding of parental presence and its impact on pain perception.

Studies with larger sample sizes for each subgroup, particularly in children under five, would provide deeper insights into the varying impacts of parental presence based on age. With Incorporating Physiological Measures to integrating both behavioral and physiological assessments of pain simultaneously, perhaps using advanced monitoring technologies and multiple observers to capture real time pain assessment during procedures.

We suggest conducting research to explore the long term impacts of procedural pain management strategies, such as parental presence and the use of non-pharmacological or pharmacological interventions. Comparing these groups with a population that lacks pain management could offer valuable insights into developmental and emotional outcomes as children age.

VI. Recommendations :

In light of our findings, we propose specific recommendations to enhance pain management within our healthcare setting. These recommendations are particularly targeted towards healthcare professionals, including physicians, nurses, medical and nursing trainees, and potentially physical therapists, any individuals involved in the care of pediatric patients undergoing painful medical procedures. Implementing these strategies is expected to optimize pain relief and improve overall patient care outcomes.

1. Fostering parental presence :

Promote parental presence during medical procedures through structured involvement guided by healthcare professionals :

- For young children, explain non pharmacological interventions for parents, such as non nutritive sucking [[75]], facilitated tucking [[76]], and swaddling [[77]], to reduce pain and anxiety.
- Minimize traditional restraint methods, as they can cause psychological distress and undermine trust between the child and healthcare providers.
- For older children, emphasize the importance of communication that distracts from pain (coping talk), such as discussing fun topics, encouraging them to bring a favorite toy, book, or game, or sharing a favorite story.
- Explain to parents the value of involving children in decision making, such as choosing which hand to use during a procedure.
- For teenagers, emphasize the importance of preparing them in advance for procedures and involving them in healthcare planning to promote autonomy and confidence. Additionally, allow them the choice of whether or not to have their parents present during the procedure.

2. Promoting Practitioner-Parent Relationships:

- First and foremost, clearly explain the action plan, involve parents in decision making, and ensure full informed consent to nurture a trusting relationship between healthcare workers and parents.
- Use effective communication by explaining the procedure, its purpose, and necessity in simple terms suited to the parents intellectual level.
- Listen carefully and show empathy, allocating specific time outside of the procedure to answer questions, minimizing interruptions and enhancing focus.
- If three attempts fail, transfer the procedure to a colleague to reduce negative emotions and explain the challenges faced to demonstrate professionalism.

3. Promoting Analgesic Use During Painful Medical Procedures:

- Implement strategies for accurate pain assessment based on age range, such as placing pain scales in treatment rooms and incorporating educational programs [[78]] for healthcare workers to familiarize them with appropriate pain evaluation methods.
- Encourage the use of local anesthetic such as EMLA cream or patch, proven to effectively reduce procedural pain such as venipuncture [[79]], intramuscular immunization [[80]][[81]], and intravenous cannulation [[82]].
- Promote the use of oral sucrose for neonates and infants, as it has demonstrated efficacy [[83]]. Oral sucrose is recommended to be included in pediatric emergency department pain management guidelines as a potential strategy for managing pain during minor procedures in infants.

4. Implementing Non Pharmacological Methods in Hospital Settings:

Several methods have proven effective in reducing pain perception in children by distracting them through auditory and visual stimulation [[84]] :

- The use of a device combining vibration and cold, such as Buzzy (figure 50 ,51), offers a safe and simple alternative to alleviate needle-related pain [[85]], especially for children younger than 9 years old [[86]].
- For children aged 4-6, the use of a kaleidoscope (figure 49) has demonstrated its effectiveness in reducing pain [[87]].
- Simpler interventions, such as play, dancing, music, animated cartoons, and blowing bubbles has proven to be effective in managing pain [[84]], we suggeste implementing TV screens, providing simple toys, playing background children's, and adopting cartoon themed wall paints in treatment rooms (figure 52,53,54).

Figure 49 : example of a kleidoscope
https://fr.aliexpress.com/i/1005006980193171.html

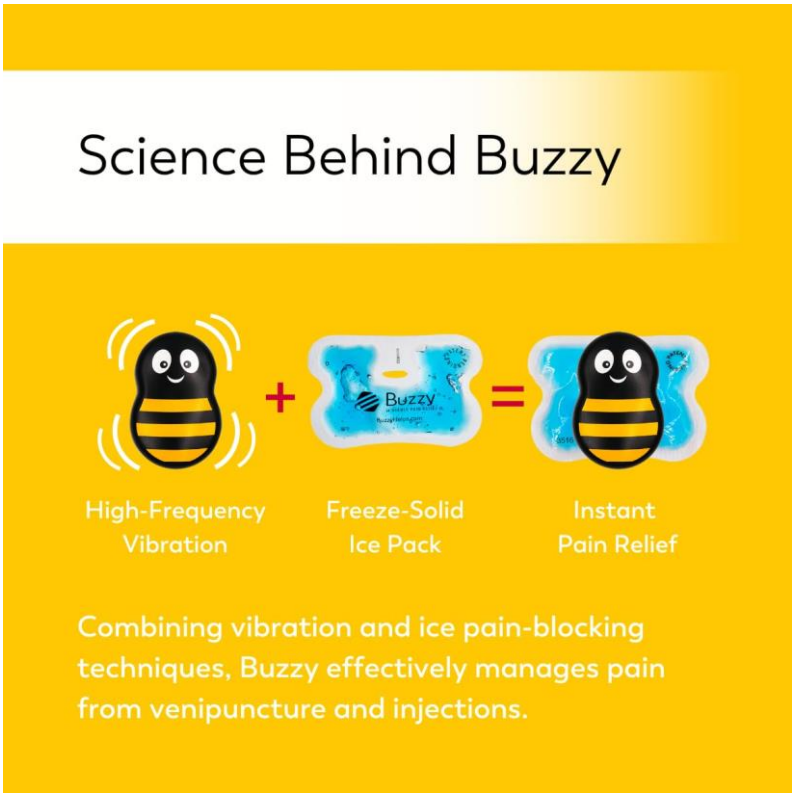


Figure 50 : buzzy device
https://www.amazon.com/Buzzy-XL-Personal-Striped-Solution/dp/B00HQ1LJIS

Figure 51 : Buzzy usage
https://www.doccheckshop.fr/injection-perfusion/consommable-injection-perfusion/accessoires/13626/buzzy-buzzy-mini-healthcare

Figure 52 : example cartoon themed walls and animal sculptures in a hospital setting https://idskids.com/project/view/silhouette-jungle-hospital-play-area/

Figure 53: example cartoon themed walls and animal sculptures in a hospital setting -2- https://idskids.com/

Figure 54 : murals in pediatric hospital
https://www.flickr.com/photos/mikimottes/

CONCLUSION

This thesis provides a comprehensive exploration of the impact of parental presence on pediatric pain perception during medical procedures, within the context of Mohamed VI Hospital Center. Through a detailed analysis of various subgroups based on age, our findings support the hypothesis that parental presence may play a crucial role in reducing procedural pain in children. Additionally, this research highlights the importance of examining not only the child-parent relationship but also the dynamics involving medical practitioners, providing a global view of pain management in pediatric settings.

key strength of this study lies in its nuanced approach, which integrates the perspectives of both parents and medical practitioners, offering a dual perspective often overlooked in previous research. By examining the use of analgesics and non-pharmacological methods, our study also provides valuable insights into the current practices within our hospital context. However, the study's limitations, including its focus on a single hospital and relatively small sample sizes in certain subgroups, highliting the need for broader, more diverse studies to generalize these findings. Moreover, challenges in assessing pain in younger children, particularly preschoolers, underline the importance incorporating physiological measures.

future research should expand to include multiple hospitals across Morocco, incorporating both public and private healthcare settings to provide a more comprehensive understanding of pain management in pediatric care. Larger sample sizes for are recommended to gain deeper insights into the varying effects of parental presence based on age. Additionally, incorporating advanced pain assessment methods, such as real time physiological monitoring, could further enhance the accuracy of pain evaluation.

In light of the findings, several practical recommendations emerge to improve pediatric pain management. Encouraging parental presence, with structured involvement guided by healthcare professionals, can significantly reduce both pain and anxiety in children. Additionally, strengthening communication between practitioners and parents is vital to building trust and ensuring effective pain management. Finally, increasing the use of analgesics and non pharmacological methods, such as distraction techniques, in hospital settings can greatly enhance the overall patient experience.

Our findings underscore the importance of parental emotional support in alleviating pediatric pain during medical procedures. Given that parental presence is generally restricted in our hospital settings, this study suggests a need to reconsider this practice. Promoting collaboration among parents, healthcare providers, and pediatric patients could enhance pain management and reduce the traumatic impact of medical interventions, paving the way for more effective, child-centered care.

ABSTRACT

ABSTRACT:

The role of parental presence during pediatric medical procedures is debated, with research suggesting it may alleviate pain perception in children. This thesis evaluates this hypothesis in a Moroccan clinical setting. We conducted a prospective, comparative observational study, involving 220 children undergoing common medical procedures, with data collection taking place in Pediatric B Department and the Medical and Surgical Emergency Department, from May to August 2024. A structured questionnaire captured demographic details, parental and practitioner preferences regarding parental presence, and pain assessments conducted before, during, and after the procedures. Data were recorded in Google Forms, transferred to Excel, and analyzed using Python, with Matplotlib and Seaborn generating graphical trends, and SciPy employed for statistical testing.

The sample included 54.9% males (n=121) and 45.1% females (n=99), with a mean age of 4.90 years (SD = 4.66). Nearly half of the children (48.2%, n=106) were from Marrakesh, and approximately half were experiencing the specific procedure for the first time. Mothers were present most frequently (49.5%, n=109), followed by fathers (30.9%, n=68). Additionally, 74.4% (n=163) of parents expressed a preference to be present during procedures, though 56.5% (n=48) of practitioners preferred parental absence. Nurses performed the majority of procedures (68.9%, n=151).

Pain scores showed a broad distribution, with a median score of 0.6 (SD = 0.25). Parental presence significantly reduced pain perception, as indicated by lower pain scores among children with a parent present ($U = 4648.5$, $p = 0.032$). Age specific analysis showed that parental presence reduced pain in newborns (0-1 month) and children aged 3-6 years, with no significant impact for children aged 1 month to 3 y.o and 6-10 y.o. Conversely, parental presence was associated with increased pain perception in adolescents (10-15 y.o). No significant difference was observed in pain perception by gender ($p = 0.9418$). Children with chronic conditions reported less procedural pain compared to those without chronic conditions ($p = 0.0314$), and first patients undergoing the procedure for the first time exhibited higher pain perceptions than those with previous experience ($p = 0.0430$). Parental gender had no significant effect on pain scores ($p > 0.05$), nor did practitioner gender ($p = 0.2529$).

These findings underscore the complexity of pediatric pain perception, with multiple influencing factors. Understanding these variables is essential for optimizing pain management, promoting effective pain assessment, and enhancing analgesic use to mitigate both short and long term consequences of untreated pain in children, especially younger ones.

RESUME:

Le rôle de la présence parentale lors des procédures médicales pédiatriques reste controversé, certaines études suggerent qu'elle pourrait réduire la perception de la douleur chez les enfants. Cette thèse vise à évaluer cette hypothèse dans un contexte clinique marocain. Nous avons mené une étude prospective comparative observationnelle incluant 220 enfants subissant des procédures médicales courantes. La collecte des données s'est effectuée au sein du service de Pédiatrie B et des services des Urgences Médicales et Chirurgicales entre mai et août 2024. Un questionnaire structuré a permis de recueillir les données démographiques, les préférences des parents et des praticiens quant à la présence parentale ainsi que les évaluations de la douleur avant, pendant et après les procédures. Les données ont été enregistrées sur papier et transférées dans Google Forms, puis vers Excel et analysées avec Python, Matplotlib et Seaborn ont été utilisés pour les représentations graphiques , et SciPy pour les tests statistiques.

L'échantillon comprenait 54,9 % de garçons (n=121) et 45,1 % de filles (n=99), avec un âge moyen de 4,90 ans (SD = 4,66). Près de la moitié des enfants provenaient de Marrakech (48,2 %, n=106), et environ la moitié subissait la procédure en question pour la première fois. Les mères étaient les accompagnatrices les plus fréquentes (49,5 %, n=109), suivies des pères (30,9 %, n=68). En outre, 74,4 % (n=163) des parents ont exprimé une préférence pour être présents pendant les procédures, bien que 56,5 % (n=48) des praticiens préfèrent leur absence. Les infirmiers ont réalisé la majorité des procédures (68,9 %, n=151).

Les scores de douleur présentaient une large distribution, avec un score médian de 0,6 (SD = 0,25). La présence parentale a significativement réduit la perception de la douleur, avec des scores de douleur plus faibles chez les enfants accompagnés par un parent ($U = 4648,5$, $p = 0,032$). L'analyse par tranche d'âge a montré que la présence parentale réduisait la douleur chez les nouveau-nés (0-1 mois) et les enfants de 3-6 ans, sans impact significatif pour les enfants de 1 mois à 3 ans et de 6 à 10 ans. En revanche, la présence parentale a été associée à une augmentation de perception de la douleur chez les adolescents (10-15 ans). Aucune différence significative n'a été observée dans la perception de la douleur selon le sexe de l'enfant ($p = 0,9418$). Les enfants atteints de maladies chroniques ressentaient moins de douleur que ceux sans conditions médicales chroniques ($p = 0,0314$), et les enfants subissant la procédure pour la première fois, avaient une perception de la douleur plus élevée que ceux ayant déjà une expérience similaire ($p = 0,0430$). Le sexe du parent accompagnant n'a pas eu d'effet significatif sur les scores de douleur ($p > 0,05$), ni celui du praticien ($p = 0,2529$).

Ces résultats soulignent la complexité de la perception de la douleur pédiatrique, influencée par de nombreux facteurs. La prise en compte de ces variables est essentielle pour optimiser la gestion de la douleur, promouvoir une évaluation efficace et accroître l'usage d'analgésiques afin de réduire les conséquences immédiates et à long terme de la douleur non traitée chez les enfants, surtout des plus bas âges.

ملخص

يدور نقاش حول تأثير وجود الأهل أثناء الإجراءات الطبية للأطفال، حيث تشير بعض الدراسات إلى أن هذا الوجود قد يخفف من شعور الأطفال بالألم. يهدف هذا البحث إلى اختبار هذه الفرضية في بيئة سريرية مغربية من خلال دراسة استباقية ومقارنة شملت 220 طفلًا خضعوا لإجراءات طبية شائعة، وتم جمع البيانات بين ماي وغشت 2024 في قسم الأطفال ب وقسم الطوارئ الطبية والجراحية. استخدم استبيان منظم لتسجيل البيانات الديموغرافية وتفضيلات الأهل والممارسين بشأن وجود الأهل، بالإضافة إلى تقييمات الألم قبل وأثناء وبعد الإجراءات. جُمعت البيانات عبر Google Forms، ونُقلت إلى Excel، ثم حُللت باستخدام Pythonوبرامج Matplotlibو Seabornلتصور البيانات إحصائيًا و SciPy للاختبارات الإحصائية.

شملت العينة 54.9% من الذكور و45.1% من الإناث، بمتوسط عمر 4.9 سنوات. كان نصف الأطفال تقريبًا من مدينة مراكش، ونصفهم يخوض التجربة لأول مرة. حضر الأمهات بنسبة 49.5% يليهم الآباء بنسبة 30.9%، وأبدى 74.4% من الأهل رغبتهم في التواجد أثناء الإجراء، بينما فضل 56.5% من الممارسين غياب الأهل. نفّذ الممرضون غالبية الإجراءات بنسبة 68.9%.

أظهرت نتائج تقييمات الألم انخفاضًا ملحوظًا في شعور الأطفال بالألم عند حضور الأهل, ($p = 0.032$) خاصةً لدى الرضّع والأطفال من 3 إلى 6 سنوات, بينما لم يكن هناك تأثير يُذكر على الأطفال من 1 شهر إلى 3 سنوات ومن 6 إلى 10 سنوات. في المقابل, ارتبط حضور الأهل بزيادة الشعور بالألم لدى المراهقين (10-15 سنة). لم يظهر اختلاف في الشعور يالألم بين الذكور والإناث ($p = 0.9418$). الأطفال المصابون بحالات مزمنة بالم أقل مقارنة بغير المصابين. ($p = 0.0314$), بينما شعر الأطفال ايخضعون للإجراء لأول مرة بألم أكثر مقارنة بأولئك الذين لديهم تجارب سابقة ($p = 0.0430$).لم يؤثر جنس الأهل أو الممارسين على درجة الألم بشكل ملحوظ

تُبرز هذه النتائج تعقيدات إدراك الألم لدى الأطفال والعوامل المتعددة التي تؤثر فيه، مما يؤكد أهمية فهم هذه المتغيرات لتحسين إدارة الألم وتقييمه، ودعم استخدام المسكنات لتقليل آثار الألم غير المعالج لدى الأطفال، لا سيما في المراحل العمرية المبكرة..

APPENDICES

Appendice 1 :

Questionnaire :

I. This question sheet is dedicated to :

- « Present Parent » group
- « Absent parent » group

II. Child related Data :

1. Demographical Data :

- Child Sex :
  - Feminin
  - masculin
- Age :
  - 0-1 month
  - 1month-3years
  - 3yrs to 6yrs
  - 6yrs to 10 yrs
  - 10yrs-15 yrs
- Date of birth :
- City of residency :

4. Clinical history :

- Chronic medical condition :
  - yes
  - no
    - If the answer is yes, what is The medical condition :
- Past history of surgery :
  - yes
  - no
- Is the Child hospitalized :
  - Yes
  - no
- First time in hospital :
  - yes
  - no
- First time undergoing a medical procedure :
  - yes
  - no
- First time undergoing this medical procedure :
  - yes
  - no

III. Parent related Data :

1. demographical data :

- Who is the child's companion :
  - Mother
  - Father
  - Another legal guardien
    - If the answer is another legal guardien, please specify :
- His/her age :
  - <20
  - 20-40
  - 40-60
  - >60
- Matromonial status :
  - married
  - divorced
  - widowed
  - single
- Origin :
  - urban
  - rural
- Percentage of time spent with the child daily :
  - 100%
  - 50-99%
  - below 50%

2. Medical history :

- Medical History of diagnosed psychological disease :
  - yes
  - no
- Medical History of chronic pain :
  - yes
  - no

3. Multiple choice Data :

- Generaly speaking, During procedures,What is your preference :
  - To be present
  - not to be present

    - If the answer is to be present, which of the folowing sentences represents your raison :
      - To reduce my anxiety
      - To reduce my kid's anxiety

- To benefit healthcare workers if any help is needed
- To understand deeply the procedure and ask questions
- To witness the procedure and build trust with healthcare workers
- Another raison

  - If the answer is « another raison », Please specify:

- Which of the following sentences is more appropriate for you :
  - I prefer to watch from a distance
  - I prefer to stay close 'skin to skin' with my child and comfort him /her
  - I prefer to be active and help by restraining my child if needed
  - If the answer is not to be present, which of the following sentences represents your raison :
    - Out of fear and anxiety
    - I can not stand seeing my child in pain or crying
    - I had a negative previous experience(s)
    - Another raison
  - If the answer is « another raison », Please specify:

IV. Medical practionner related Data :

1. Demographical Data :

- Procedure done by :
  - Resident
  - intern
  - nurse
  - medical trainee
  - nurse trainee
- Gender :
  - Feminin
  - masculin
- Duration of medical practice :
  - Less than 5 years
  - between 5-10 years
  - more than 10 years

2. Multiple choice Data :

- Generally speaking, when executing a procedure , what is your preference :
  - Parental presence
  - Parental absence

- Regarding parental presence, which of the following sentences represents its benefit:
  - To diminish the child's pain
  - To increase the child's calmness and stillness

- To favorise parents implication
- To simplify the communication with the child
- Another raison

  - If the answer is « another raison », Please specify:

- Regarding parental presence, which of the following sentences represents its inconvenient :
  - increasing performance anxiety
  - consumption of time to explain and answer the parent's questions
  - interferance of parents
  - fainting of the parent in the midst of the procedure
  - Another raison

  - If the answer is « another raison », Please specify:

VII. Procedure Related Data :

1. **Type pf procedure :**
   - IV cannulation
   - vanipuncture
   - Injection
   - Nasogastric tube
   - suturing
   - Lumbar puncture
   - urinary catheterization
   - plaster cast
2. **is the child under analgesia :**
   - yes
   - no
3. **if the answer is yes, which type of analgesia is used :**

- **pharmaceutical**
  - first ladder analgesia
  - second ladder analgesia
  - third ladder analgesia
  - local analgesia
- **non pharmaceutical :**
  - oral sucrose
  - Non-nutritive sucking
  - Kangarou care
  - Breastfeeding
  - Swaddling

4. **Pain evaluation/ clinical observation :**

Age	0-1 month	1month-3years	3-6 years	6-10 years	10-15 years
Timing	NIPS	FLACC	FPS	NRS	NRS
T-1					
T0					
T+1					

« T -1 » = 5mins to just before the procedure
« T0 » = during the procedure
« T1 » = 5 to 10 mins afterthe procedure

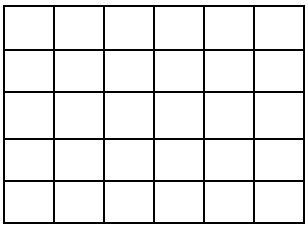
5. **Success of the procedure :**
   - From the first attempt
   - Two attempts
   - Three attempts
   - >three attempts

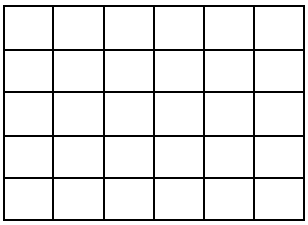
- **Appendice 2 :**

Progress tracking chart

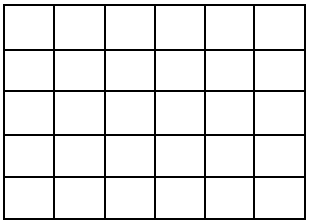
« Present- parent » group « absent parent » group

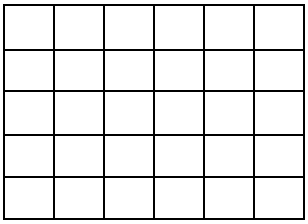
I. age range : 0 - < 1month :



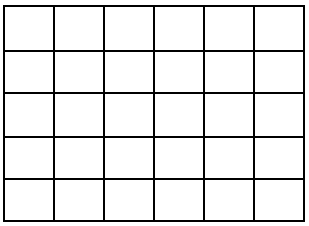


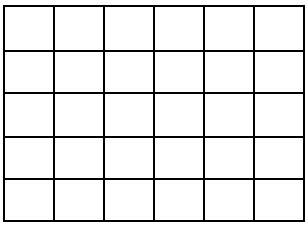
II. age range : 1- <3 years :



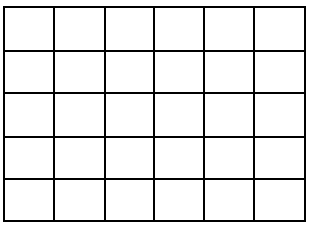


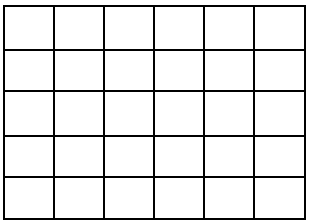
III. age range : 3 - <6 years :



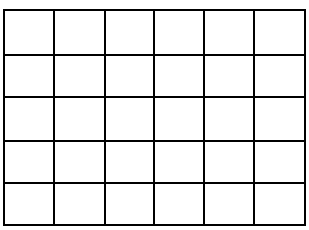


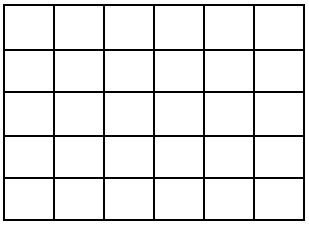
IV. age range : 6 - < 10 years :





V. age range : 10 -< 15 years :





- **Appendice 3 :**

Pain scales :

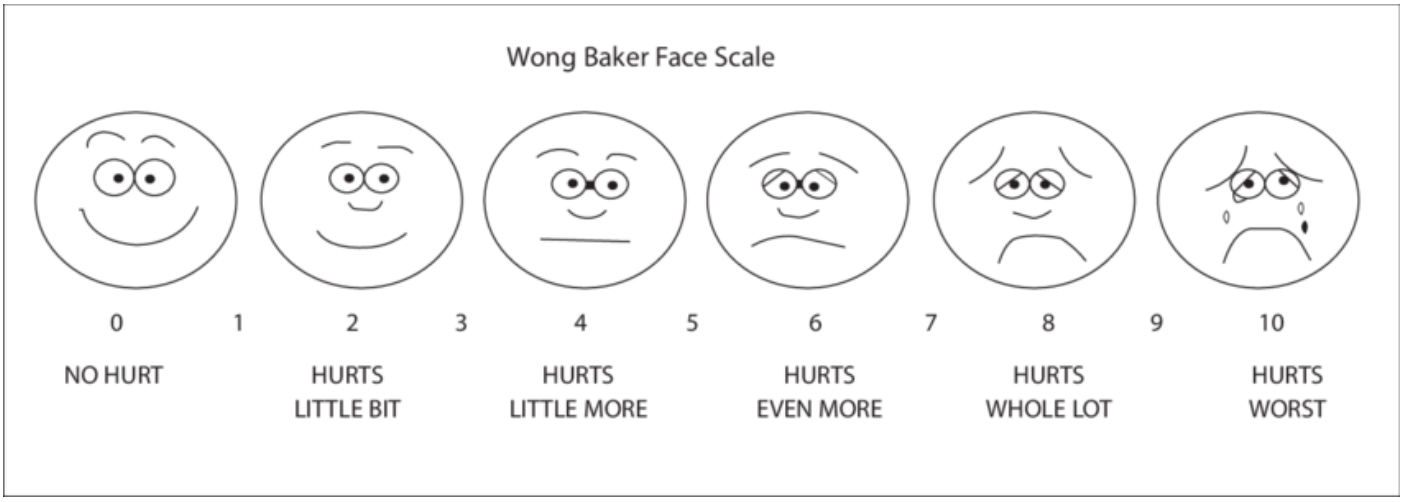
1.Neonatal infant pain (NIPS) scale :

Parameter	Finding	Points
Facial expression	-Relaxed -Grimace	0 1
Cry	-No cry -Whimper -Vigorous cry	0 1 2
Breathing pat-terns	-Relaxed -Change in breathing	0 1
Arms	-Relaxed/restrained -Flexed /extended	0 1
Legs	-Relaxed/restrained -Flexed /extended	0 1
State of arousal	-Sleeping/awake -Fussy	0 1
	Score	

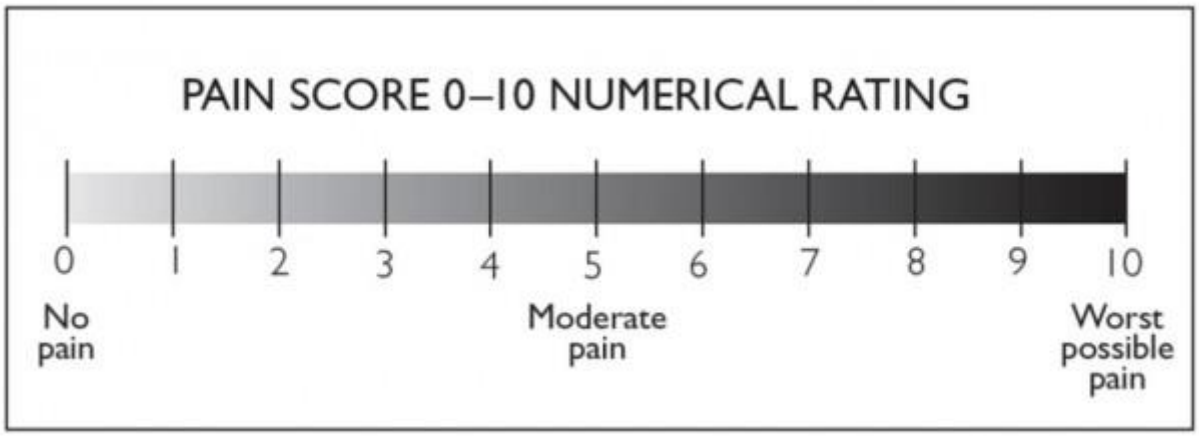
2.Face Leg Activity Cry Consolability (FLACC) scale :

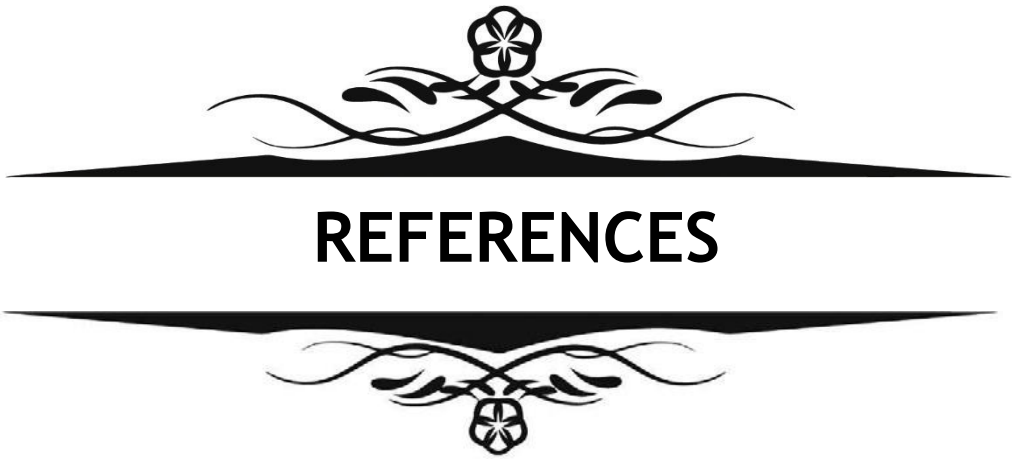
Parameters	Findings	Points
Face	-No particular expression or smile -Occasional grimace or frown, withdrawn, disinter-ested -Frequent to constant frown, quivering chin, clenched jaw	0 1 2
Legs	-Normal position or relaxed -Uneasy, restless, tense -Kicking or legs drawn up	0 1 2
Activity	-Lying quietly, normal positionn moves easily -Squirming, shifting back and forth, tense -Archedn rigid, or jerking	0 1 2
Cry	-No cry -Moans or whimpers, occasional complaint -Crying steadily, screams or sobs, frequent com-plaints	0 1 2
Consolability	-Content relaxed -Reassured by occasional touching hugging or be-ing talked -to distractile -Difficult to console or comfort	0 1 2
	Score	

3- Face pain scale (FPS) :



4 – Numeric pain Scale (NPS) :





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قسم الطبيب :

أقْسِم بِالله العَظِيم

أن أراقبَ الله في مِهْنَتِي.

وأن أصُونَ حياة الإنسان في كآفّة أطوَارهَا في كل الظروف والأحَوال باذلة وسْعِي في إنقاذها مِن الهَلاك ِوالمرَضِ و الألَم والقَلَق.

وأن أحفَظَ لِلنَاسِ كرَامَتهُم، وأسْتر عَوْرَتهُم، و أكتمَ سِرَّهُمْ.

وأن أكونَ عَلى الدوَام من وسائِل رحمة الله، باذلة رعايتي الطبية للقريب والبعيد، للصالح والطالح، والصديق والعدو.

وأن أثابر على طلب العلم، وأسَخِّرَه لِنَفْعِ الإنْسَان لا لأذَاه.

وأن أُوَقّر َمَن عَلَّمَني، وأُعَلّمَ مَن يصغرني، وأكون أختا لِكُلّ زَميلٍ في المِهنَةِ الطِّبّيَة مُتعَاونِينَ عَلى البرّ و التقوى.

وأن تكون حياتي مِصْدَاق إيماني في سِرّي وَعَلانيَتي ،نَقِيَّة مِمّا يشينها تجَاهَ الله وَرَسُولِهِ وَالمؤمِنين.

والله على ما أقول شهيد

كليـــــــة الـطـب
والصيدلة - مراكش
FACULTÉ DE MÉDECINE
ET DE PHARMACIE - MARRAKECH
MARRAKECH
جامعة القاضي عياض
UNIVERSITÉ CADI AYYAD

سنة 2024 أطروحة رقم : 487/24

حضور الوالدين و إدراك الألم لدى الأطفال

الأطروحة

قدمت ونوقشت علانية يوم 2024/11/13

من طرف

السيدة اميمة نحيل

المزداد في 04/ 10/ 1999 باليوسفية

لنيل شهادة الدكتوراه في الطب

الكلمات الأساسية:

ألم –أطفال–والدين

اللجنة

الرئيس	السيد **س. يونوس** أستاذ في الإنعاش والتخدير	
المشرفة	السيدة **إ.أيت صاب** أستاذ في طب الأطفال	
الحكام	السيد **م. بوروص** أستاذ في طب الأطفال	
	السيدة **ه. نصيح** أستاذة في طب الأطفال	