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EXAMINING THE INFLUENCE OF MULTI-SENSORY MARKETING TECHNIQUES ON PERCEIVED SERVICE QUALITY IN THE PAEDIATRIC DEPARTMENT OF HOSPITAL DA LUZ LISBOA

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ABSTRACT

This research explores the influence of multi-sensory marketing on perceived service quality within the paediatric department of Hospital da Luz Lisboa. Grounded in sensory marketing theory, it investigates how visual, auditory, olfactory, and tactile stimuli influence the well-being of paediatric patients and their caregivers. Employing a qualitative ethnographic approach, data were collected through observations, focus groups, and interviews. Thematic analysis reveals that sensory elements alleviate anxiety, enhance comfort, and positively influence perceptions of care quality and waiting time experiences. The findings underscore the strategic value of sensory interventions in fostering patient-centred care, perceived service excellence, and a strong healthcare brand identity in paediatric settings.

Keywords: *Sensory Marketing, Multi-Sensory Techniques, Perceived Service Quality, Healthcare Marketing, Paediatric Healthcare, Sensory Stimuli, Paediatric Department of Hospital da Luz Lisboa.*

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1. INTRODUCTION

1.1 Context and Background

In contemporary healthcare, customer experience is increasingly recognized as a pivotal in achieving favourable healthcare outcomes and fostering institutional reputation. Paediatric care presents unique challenges, as hospital environments often evoke anxiety and stress in young patients, caregivers, and healthcare professionals alike. This stress can negatively influence overall healthcare perceptions, potentially impacting physical and emotional well-being (Ulrich, 1991). Sensory marketing - a field pioneered by Krishna (2012) - presents an opportunity to address these challenges by leveraging sensory stimuli, such as sight, sound, scent, and touch, to shape perceptions and experiences in healthcare settings.

While sensory marketing techniques have been widely adopted across retail and hospitality industries, their application within healthcare remains underexplored, particularly in paediatric environments. Research has shown that sensory elements can reduce stress, improve mood, and enhance service quality perceptions (Krishna, 2011; Lindstrom, 2005). However, there is limited evidence on how these techniques affect the patient experience in healthcare contexts, especially in settings as sensitive as paediatric care, where emotional comfort is paramount. Given the shift toward patient-centred care, this research aims to bridge this gap by examining how multi-sensory marketing influences perceived service quality in the paediatric department of Hospital da Luz Lisboa.

1.2 Research Aim and Objectives

This research seeks to explore how multi-sensory marketing techniques influence patient and caregiver experiences within the paediatric department of Hospital da Luz Lisboa. Specifically, the research examines how individual sensory elements - visual, auditory, olfactory, and tactile - shape perceptions of service quality. To address this aim, the research pursues the following objectives: a) to critically evaluate the influence of sensory elements on perceptions.; b) to provide actionable recommendations for enhancing paediatric healthcare environments through sensory marketing.

1.3 Rationale for the Research

The literature on sensory marketing mainly addresses adult or general healthcare contexts, with minimal focus on the unique needs of paediatric patients. Studies show that sensory elements, like ambient music and visuals, can improve comfort and reduce stress (Mattila & Wirtz, 2001), yet the specific needs of young patients, often more anxious in clinical settings, remain underexplored. Krishna (2012) highlighted sensory marketing's influence on perception and behaviour, but its application in paediatric healthcare is mainly absent from research. By integrating sensory principles, hospitals like Hospital da Luz Lisboa can enhance patient-centred care, fostering comfort, trust, and satisfaction. This research aligns with the hospital's commitment to quality care, offering insights to enhance both customer experience and competitive positioning.

1.4 Overview of Hospital da Luz Lisboa and Paediatric Services

Luz Saúde, a leading healthcare provider in Portugal, operates 28 facilities branded Hospital da Luz. Hospital da Luz Lisboa is a key contributor, generating 27% of its procedures and 40% of its revenue. Paediatric consultations account for 5.2% of Luz Saúde's total volume and 6.2% of its revenue, with Hospital da Luz Lisboa contributing 7% of the volume and 8.1% of its revenue for paediatric consultations. Quality interactions in outpatient consultations can significantly shape perceptions of care, underscoring the need for an enhanced paediatric experience as a priority for healthcare improvement. "Hospital da Criança e do Adolescente" within Hospital da Luz Lisboa demonstrates the institution's commitment to age-appropriate, sensory-focused care that fosters trust and reduces anxiety, reinforcing its mission to provide a holistic, supportive experience for young patients and their caregivers.

2. THEORETICAL BACKGROUND

2.1 Theoretical Foundations of Sensory Marketing

Sensory marketing engages the five senses - sight, sound, smell, taste, and touch - to shape consumer perceptions and behaviours. Krishna (2012, 2013) provides foundational insights into how sensory stimuli

create immersive, emotionally resonant environments, showing how businesses can strategically use these elements to influence customer perceptions. Hultén (2011) expands this idea with multi-sensory brand experiences, suggesting that coordinated sensory approaches build emotional connections with consumers, applicable beyond retail to settings like healthcare where emotional engagement can enhance experiences. Hultén, Broweus, and van Dijk (2009) emphasize that sensory stimuli create more engaging, memorable experiences, highlighting the value of sensory marketing in diverse contexts, including healthcare.

a) Vision: Vision plays a critical role in shaping perceptions of an environment. Using colours, lighting, and design, spaces can be transformed to energize or calm individuals. Krishna (2012) and Lindstrom (2005) argue that visual elements are essential in reducing anxiety in healthcare settings. In paediatric environments, applying soothing colours and child-friendly designs can alleviate stress and help create a more welcoming atmosphere (Ulrich et al., 2008).

b) Sound: Sound, including background music and nature sounds, has reduced stress and improve relaxation. Mattila and Wirtz (2001) highlight how the congruence of sensory elements, such as sound and scent, can enhance overall satisfaction. In healthcare settings, soothing auditory stimuli help create a more tranquil environment, especially in paediatric waiting rooms.

c) Smell: Scents have the power to evoke emotions and memories. Ulrich et al. (2008) demonstrated that pleasant aromas in healthcare environments can significantly reduce patient stress and enhance perceptions of service quality. In paediatric care, the use of calming scents can make the hospital experience less intimidating for children and their caregivers.

d) Touch and Taste: The tactile qualities of materials, such as the softness of seating or interactive toys, can influence both physical comfort and perceptions of care quality (Krishna, 2012). Though taste may be less prominent in most healthcare environments, it plays a more significant role in long-term care, where food quality affects patient satisfaction (Berry & Bendapudi, 2007).

By engaging multiple senses, healthcare providers can cultivate environments that are both physically soothing and emotionally reassuring, thereby enhancing the overall experience for paediatric patients and caregivers.

2.2 Role of Sensory Marketing in Healthcare and Paediatric Context

While sensory marketing has been widely adopted in retail and hospitality industries, its application in healthcare is still emerging. Hultén, Broweus, and van Dijk (2009) emphasize the importance of sensory stimuli in engaging consumers, a highly relevant insight in healthcare, where patients' emotional and physical comfort are vital considerations. Mattila and Wirtz (2001) showed that sensory congruency significantly enhances satisfaction. This principle can be applied to healthcare settings to improve the customer experience, particularly in paediatric departments where stress and anxiety are prevalent.

In paediatric care, sensory marketing can be instrumental in creating comforting environments that reduce anxiety and improve satisfaction. Berry and Bendapudi (2007) argue that healthcare providers, especially those focused on paediatric care, can benefit from sensory marketing strategies, improving patient satisfaction and institutional reputation. While sensory marketing often engages all five senses, taste is excluded in this research due to the healthcare setting's specific constraints, where taste stimuli are neither feasible nor typically relevant. Berry and Bendapudi (2007) note that certain sensory applications may be limited in healthcare environments, underscoring the need for context-appropriate adaptations.

2.3 Perceived Service Quality in Paediatric Healthcare

Perceived service quality, a key factor in patient satisfaction and loyalty, is shaped by five dimensions defined in the SERVQUAL model (Parasuraman, Zeithaml, and Berry, 1988). Sensory marketing can enhance these dimensions in healthcare. For instance, the "tangibles" dimension, involving the physical environment, benefits from appealing designs, colours, and textures that create a welcoming space (Krishna, 2012). The "empathy" dimension, emphasizing personalized care, can be supported through sensory elements that foster emotional comfort. In paediatric care, sensory interventions such as child-friendly visuals, soothing sounds, and calming scents reduce anxiety, improving emotional well-being and perceptions of service quality.

Research by Pham Thi (2013) and Biswas et al. (2019) confirms that multi-sensory experiences enhance patient satisfaction and perceived service quality. In paediatric healthcare, sensory marketing thus serves as a powerful tool to enhance customer satisfaction and service quality perception.

2.4 Review of Foundational and Emerging Literature on Sensory Marketing in Healthcare

Holbrook and Hirschman (1982) highlighted the experiential and emotional aspects of consumption, providing insights valuable for enhancing patient experiences in healthcare, especially in paediatrics where sensory stimuli can reduce anxiety. Ulrich et al. (2008) further support the importance of sensory elements - like calming colours, soothing sounds, and pleasant scents - in creating healing environments that reduce stress and promote well-being. Krishna (2012, 2013) established foundational principles of sensory marketing, demonstrating its impact on perceptions and behaviours, which is increasingly applicable in healthcare to improve patient outcomes through strategic sensory interventions. Hultén (2011) showed that multi-sensory branding fosters emotional connections, relevant for healthcare in enhancing patient comfort and satisfaction. Extending these ideas, Berry and Bendapudi (2007) and Ulrich (1991) demonstrated how sensory elements can improve service quality and patient outcomes. Recent studies, such as Antunes and Veríssimo (2024), reveal emerging trends in sensory marketing in healthcare, identifying research gaps in multi-sensory approaches, particularly in paediatric settings, and underscoring the need for further study.

2.5 Evidencing and Presenting the Research Question

While sensory marketing is well-researched in retail and hospitality, its application in healthcare - particularly in paediatric care - remains notably underexplored. Studies, such as those by Mattila and Wirtz (2001), demonstrate that sensory elements like scent and music can influence behaviour; however, the unique psychological and emotional needs of paediatric patients have not been sufficiently examined within this framework. Paediatric patients are especially susceptible to anxiety, underscoring the need for targeted research into how sensory interventions might effectively reduce stress, enhance comfort, and improve satisfaction for both young patients and their caregivers. Most healthcare research has centred on adult

populations, often overlooking the distinct sensory responses of children and their caregivers. This study addresses this critical gap by examining how tailored sensory elements influence paediatric patients' and caregivers' perceptions of care quality, thereby advancing sensory marketing's role within healthcare. The findings lay a foundation for integrating sensory elements into paediatric care models, contributing to enhanced patient-centred practices that elevate both patient and caregiver satisfaction. Based on the identified gaps and the extensive literature review, this research seeks to answer the question, "How do multi-sensory marketing techniques influence perceived service quality in the paediatric department of Hospital da Luz Lisboa?". Specifically, this research aims to identify which sensory elements, sight, sound, scent, and touch, influence the most on caregivers' perceptions of service quality.

3. METHODOLOGY

3.1 Philosophical Stance

This research adopted a pragmatic philosophical stance, focusing on practical outcomes to directly inform healthcare practices. Pragmatism was particularly suitable for examining the influence of multi-sensory marketing techniques on perceived service quality within the paediatric department of Hospital da Luz Lisboa. This approach values real-world experiences and actionable insights, allowing flexibility and adaptability to explore complex, context-specific phenomena, such as the interplay between sensory stimuli and healthcare outcomes (Creswell & Plano Clark, 2011). Unlike positivist approaches that prioritize objective quantification, pragmatism supports flexible data interpretation and values subjective experiences, aligning with the qualitative nature of this research (Patton, 2002).

3.2 Research Approach

A qualitative approach was chosen to capture in-depth insights into how sensory stimuli shape patient and caregiver experiences in the paediatric department of Hospital da Luz Lisboa. Qualitative research is well-suited for understanding subjective experiences and emotions, facilitating a comprehensive exploration of sensory interactions within the hospital setting (Patton, 2002). This approach enabled a nuanced examination

of how multi-sensory engagement can reduce anxiety and enhance the healthcare experience for paediatric patients and caregivers. While mixed methods are often advised for comprehensive insights (Creswell & Plano Clark, 2011), a qualitative approach was selected to enable a deeper exploration of patient and caregiver experiences and perceptions.

3.3 Research Design

The research adopted an ethnographic design, allowing for immersion into the day-to-day interactions and dynamics among paediatric patients, caregivers, and medical staff. Ethnography enables observing and interpreting of cultural and behavioural patterns within a natural setting. It is ideal for exploring how sensory elements influence emotional states and real-time service quality perceptions (Hammersley & Atkinson, 2007). This design was selected over other qualitative approaches (such as case studies or phenomenology) for its strength in capturing authentic, context-specific interactions with sensory stimuli in healthcare, where participants' immediate responses and lived experiences were crucial to understanding the impact of sensory marketing techniques.

3.4 Preliminary Waiting Room Setting Analyses and Adaptations

Before data collection, a preliminary analysis of the sensory elements in the paediatric waiting room assessed existing features to inform the introduction of new stimuli aimed at enhancing patient and caregiver experiences. Key criteria included visual appeal, comfort, spatial organization, and engagement potential, establishing a foundation for further sensory improvements, as follows:

a) Visual: The waiting room incorporated visual elements such as the hospital's branded colours and images of animals and plants, integrated into a nature-themed ambiance centred around a wooden structure in the middle of the space. These visual features contributed to creating a welcoming and child-friendly environment, fostering a sense of comfort and engagement among young patients (figure1 in appendix A).

b) Tactile: The waiting room's tactile experience was enhanced with a central wooden structure, child-friendly seating, and hospital-branded materials like colouring books and pencils perfectly suited for this research phase (figure 2 in appendix A). These elements fostered creative engagement, reduced anxiety, and offered comfort. This analysis underscores the importance of sensory marketing in creating a supportive hospital environment, providing a basis for introducing further sensory elements to improve the experiences of paediatric patients and their caregivers.

3.4.1 Introduction of Additional Sensory Elements

Drawing on insights from the preliminary analysis, two supplementary sensory elements were introduced to refine further and enhance the waiting room environment:

a) Scent: The collaboration with the olfactory marketing specialist company "I-senses" led to the selection of two scents optimally tailored to the needs of the paediatric hospital, providing a soothing and welcoming atmosphere. Two selected scents "White Ritual" and "Baby Sweet Dream" (figure 3 in Appendix A) were alternated weekly over two weeks to evoke tranquility and reduce anxiety. Literature supports the use of specific scents to alleviate stress, particularly in paediatric settings (Mattila & Wirtz, 2001).

b) Sound: Nature sounds, such as birds chirping, flowing water, and wind through trees, were introduced through discreet speakers (Reference links 1 in Appendix A). These sounds were chosen based on evidence that auditory stimuli can reduce stress and promote relaxation in healthcare (Ulrich et al., 2008), as previous research suggests that nature's sounds activate the parasympathetic nervous system, fostering a calming "rest-and-digest" response that offsets stress (van Praag et al., 2017).

Integrating visual, tactile, auditory, and olfactory stimuli established a comprehensive multi-sensory environment to reduce anxiety, enhance emotional comfort, and elevate the patient and caregiver experience. This approach aligns with contemporary healthcare design, underscoring the role of sensory engagement in shaping patient emotions and perceived care quality, ultimately fostering reassurance and well-being within the hospital setting.

3.5 Data Collection Methods

A multi-method data collection strategy, encompassing participant observations, semi-structured interviews, and focus group discussions, was used to capture diverse perspectives. Prior to applying these methods, a preliminary analysis showed that, during the research period, an average of 232 paediatric appointments were scheduled daily from 8 a.m. to 8 p.m. (ranging from 172 to 308), with over 70% being follow-up visits, indicating patient familiarity with the hospital. This groundwork enabled an in-depth exploration of sensory influences on paediatric patient and caregiver experiences through the following measures:

a) Participant Observations: Twenty-six participant observations were conducted over five days to systematically document interactions among paediatric patients, caregivers and sensory stimuli. Observers recorded behaviours and emotional responses reflecting comfort, anxiety, and engagement, with observations categorized by sensory modality. This structured approach offered nuanced insights into the influence of visual, auditory, olfactory, and tactile stimuli on the experiential dimensions of paediatric care (Table 1 in Appendix B).

b) Interviews with Caregivers: Seventeen semi-structured interviews were conducted to capture caregivers' subjective experiences and perceptions of the sensory environment, focusing on emotional comfort, perceived waiting times, and overall service quality. As both observers and participants, caregivers offered a unique dual perspective, allowing for a comparative analysis of current and past experiences within the hospital setting. Given that over 70% of paediatric patients were returnees, these follow-up contexts enriched the interview data by providing insights into evolving perceptions over time (Appendix C).

c) Interviews with Medical Staff: Five interviews with paediatric medical staff provided insights into the influence of sensory elements on patient behaviour and caregiver interactions. Doctors′ perspectives encompassed practical evaluations of sensory interventions, observations on their capacity to improve satisfaction, and recommendations for enhancing the waiting room environment to better support patient and caregiver well-being, enhancing quality perceptions (Appendix D).

d) Focus Group with Hospital Staff: A focus group comprising five hospital staff members - two customer service technicians, a clinical assistant, a paediatric nurse, and a manager from the paediatric team - provided operational insights into sensory elements. Staff discussed the effects of sensory stimuli on patient comfort and caregiver satisfaction, offering practical perspectives on sensory marketing in a healthcare context (Appendix E).

3.6 Participant Selection and Sampling Criteria

Purposive sampling was used to select participants who directly interacted with the sensory elements, including caregivers, medical staff, and hospital assistants. This approach allowed for capturing immediate responses to sensory stimuli, aligning with qualitative research's focus on depth over breadth (Etikan, Musa, & Alkassim, 2016). Both male and female caregivers were included, and diversity in age groups was prioritized to ensure comprehensive perspectives on the sensory environment. Medical staff and hospital assistants contributed diverse insights based on their varied roles and experiences with sensory engagement in healthcare.

Alternative sampling methods, such as stratified sampling by caregiver age or role, were considered but ultimately rejected in favor of purposive sampling to emphasize the direct, context-specific experiences of those most involved with the sensory interventions. While limiting generalizability, this approach aligns with qualitative research's goal of exploring detailed, in-depth insights (Palinkas et al., 2015). Data collection spanned three weeks in August and September 2024, allowing participants sufficient time to engage with sensory elements and provide contextually relevant feedback.

3.7 Data Analysis

The data were analyzed using thematic analysis, a robust qualitative method for systematically identifying, analyzing, and interpreting patterns within the data (Braun & Clarke, 2006). This approach facilitated the structured categorization of insights into distinct themes related to sensory stimuli and patient experience, offering a nuanced understanding of participant responses. A rigorous, multi-phase process was implemented to ensure analytical depth and validity (Tables 1-4 in Appendix F).

a) Familiarization: Observational notes, interview transcripts, and focus group recordings were meticulously reviewed to establish a comprehensive understanding of the data. Observations were categorized by layout, decor, lighting, cleanliness, and paediatric patient behaviour, each defined with consistent operational terms. This framework enabled detailed analysis of spatial arrangements, colour schemes, ambient noise, and patient and caregiver emotional responses. Semi-structured interviews with caregivers explored sensory experiences in the waiting area, such as smell, sound, visuals, and touch, using open-ended questions to assess their impact on comfort, well-being, and satisfaction. Focus groups added insights into the practical application of sensory marketing, highlighting its potential to enhance perceived service quality.

b) Coding: Coding was conducted using Atlas.ti, with codes categorized based on sensory elements and their effects on emotional comfort, perceptions of cleanliness, and engagement. Multiple coders were used, and initial codes were refined through iterative reviews to ensure consistency and reduce subjective bias.

c) Theme Development: Codes were organized into broader themes, such as perception of service quality and managing waiting time perception. These themes revealed how sensory marketing interventions impacted paediatric patients' and caregivers' emotional well-being. Clustering codes into meaningful categories were systematically reviewed to ensure themes accurately reflected the data.

d) Review and Refinement: Themes were rigorously reviewed and refined to ensure they represented the data and aligned with research objectives. Particular attention was paid to maintaining mutually exclusive themes that offered meaningful insights. Reflexivity was incorporated into the analysis process to acknowledge potential researcher biases and maintain objectivity, which is crucial in qualitative research.

e) Interpretation: The final themes were interpreted within the existing literature on sensory marketing and healthcare, drawing Krishna's (2012) and Mattila and Wirtz's (2001) studies. This comparison strengthened the research's credibility, allowing the findings to contribute to academic discourse and provide practical recommendations for healthcare administrators on sensory interventions.

4. FINDINGS

4.1. Introduction

Data for this research were gathered using a multi-method qualitative approach, over three weeks of participant observations, semi-structured interviews, and a focus group. It provided comprehensive insights into the influence of sensory marketing on service quality in the paediatric department. Each sensory theme below illustrates how specific elements shape these experiences:

a) Theme One: The Role of Multi-Sensory Engagement in Service Quality Perception

The sensory-rich environment was consistently viewed as welcoming and thoughtfully designed, leading to improved perceptions of service quality and higher caregiver satisfaction. The combination of sensory elements created a more positive, engaging environment.

b) Theme Two: The Role of Multi-Sensory Engagement in Managing Waiting Time Perception

Multi-sensory elements alleviated the perceived length of waiting, making it feel shorter and less stressful. Sensory engagement reshaped time perception, a critical factor in service satisfaction, fostering a more relaxed and positive waiting experience.

4.2 Theme One: The Role of Multi-Sensory Engagement in Service Quality Perception

The integration of multi-sensory marketing techniques within the paediatric department had a significant and transformative impact on the perceived service quality. Caregivers frequently linked their heightened satisfaction with the hospital's services to the thoughtfully curated sensory elements that shaped their waiting room experience. These sensory components, ranging from calming scents to visually stimulating decor, enhanced the overall ambiance and exemplified meticulous attention to detail. This attention reflected the hospital's deep commitment to patient comfort and well-being, as noted consistently in caregiver interviews. By addressing the emotional and psychological needs of patients and caregivers, the sensory elements went beyond mere aesthetics. They actively reshaped the environment into a space that felt welcoming, calming, and supportive. This holistic approach to the sensory experience helped to elevate perceptions of high-

quality, compassionate care, reinforcing the hospital's image as a provider deeply attuned to patient-centred healthcare. Ultimately, these elements contributed to a more positive, stress-reducing experience, significantly enhancing the overall satisfaction of paediatric patients and their caregivers.

4.2.1 a) The Impact of Sensory Elements on Perceived Service Quality

Integrating multi-sensory elements, such as calming music, pleasant fragrances, interactive tactile features, and visually stimulating décor, played a pivotal role in shaping caregivers' perceptions of service quality within the paediatric department. These sensory enhancements were highlighted as key contributors to creating a more comfortable, soothing, and emotionally supportive environment. By mitigating stress and alleviating anxiety for paediatric patients and their caregivers, these sensory interventions helped transform the often-stressful experience of waiting in a hospital setting into a more pleasant and manageable one.

Caregivers particularly appreciated the hospital's thoughtful and holistic approach, viewing these sensory elements as a reflection of the institution's deep commitment to patient-centred care. The combination of auditory, olfactory, tactile, and visual stimuli did more than simply enhance the physical ambiance; it underscored the hospital's focus on addressing both the emotional and psychological needs of its patients and their families. This multi-sensory design improved the atmosphere and conveyed a strong message of empathy and attentiveness, reinforcing the perception that the hospital was invested in providing exceptional, compassionate care.

Supporting evidence: a) "These sensory elements - visuals, sound, and tactile aspects - are directly related to how the hospital adapts to children and influence my perception of the quality of the paediatric service. A welcoming and child-friendly environment shows extra care and improves the quality of the service." (IC01); b) "Yes, definitely (sensory elements affect the perception of quality). I think it shows a special level of care." (IC10); c) "On the positive side, without a doubt, (sensory elements) are very important. They affect (the perception of quality and the level of satisfaction)." (ID02). See all quotes mentioned in Findings in Appendix G.

4.2.1 b) Increased Satisfaction and Trust through Sensory Engagement

Caregivers consistently reported heightened satisfaction levels when sensory elements were thoughtfully integrated into the waiting room environment. The multi-sensory approach significantly enhanced the paediatric department's atmosphere, making it more inviting and less intimidating, directly improving caregivers' perceptions of service quality. This sensory engagement was frequently cited as a pivotal factor in their overall satisfaction and was commonly noted as a reason for their confidence in recommending the hospital's services to others. Observations and focus group discussions with hospital staff further substantiated these findings. Healthcare personnel, including clinical assistants and customer service technicians, emphasized that the integration of sensory elements contributed to a calmer and more organized environment, which in turn could reduce the volume of inquiries from anxious caregivers. Staff also observed that sensory features, such as calming music and visually engaging decor, played an instrumental role in managing the emotional responses of paediatric patients, contributing to a more positive overall care experience. Both caregivers and hospital staff agreed that the thoughtful application of sensory marketing in the waiting room significantly reduces stress and anxiety, a sentiment strongly supported by 93% of caregivers (16 out of 17 interviews). This multi-sensory engagement had a measurable impact on enhancing the perception of service quality across multiple touchpoints. The alignment between caregiver feedback and staff observations underscores the efficacy of sensory design in healthcare environments, demonstrating its role in fostering emotional well-being and enhancing patient and caregiver satisfaction. By carefully curating sensory elements, the hospital created an environment that prioritized comfort and emotional support, which not only improved immediate experiences but also cultivated long-term trust in the hospital's commitment to providing high-quality, compassionate care.

Supporting evidence: a) "The sensory elements make the experience much more pleasant. From the smell to the paintings, everything is designed to make the environment comfortable for both parents and children." (IC15); b) "All of these elements help create a pleasant environment and make a difference in our overall satisfaction." (IC16); c) "I believe these elements could definitely reduce complaints, particularly those

related to waiting times." (FGA3); d) "In terms of customer satisfaction and even in creating a good working environment among the professionals, I think it has benefits for everyone." (FGA5).

4.3 Theme Two: The Role of Multi-Sensory Engagement in Managing Waiting Time Perception

Waiting time emerged as a critical factor in shaping caregivers' overall experiences and perceptions of service quality within the paediatric department. The availability and effectiveness of multi-sensory stimuli played a pivotal role in influencing how caregivers perceived the duration of their wait. When paediatric patients were actively engaged through a combination of visual, auditory, tactile, and olfactory stimuli, 71 % of caregivers reported reduced anxiety and a greater sense of ease regarding waiting times. The sensory engagement provided not only a source of distraction but also contributed to creating a more relaxed and emotionally supportive environment.

Conversely, in the absence of sufficient sensory stimuli (tactile elements assuming greater significance), caregivers were more likely to experience heightened impatience and frustration, further underscoring the importance of multi-sensory engagement in shaping expectations and perceptions. The lack of sensory elements often exacerbated the psychological burden of waiting, highlighting the significant role sensory interventions play in managing both time perception and overall emotional well-being. In this context, multi-sensory engagement emerges as a critical strategy for enhancing the waiting experience, reducing stress, and elevating perceptions of care quality.

4.3.1 a) Prolonged Waiting Time and Its Influence on Emotional Stress

Prolonged waiting times emerged as a significant source of stress for many caregivers, mainly when paediatric patients were not adequately engaged. In such instances, caregivers frequently resorted to checking their phones, expressing dissatisfaction, or seeking updates from staff regarding the anticipated duration of their wait. The absence of engaging sensory stimuli, particularly for infants and young children, exacerbated this stress and often led to negative perceptions of the overall quality of service.

Without the mitigating effect of sensory interventions, the emotional strain experienced by caregivers was amplified, heightening feelings of frustration and impatience. This lack of sensory engagement not only intensified the psychological burden of waiting but also diminished the perceived quality of the healthcare experience, underscoring the critical role of multi-sensory elements in alleviating the challenges associated with extended waiting periods.

Supporting evidence: a) "As it was taking a while, they seemed nervous and tired and requested at info point to speed up the process or reschedule." (O6); b) "If a child is entertained, they can wait for an hour and not even realize how much time has passed." (IC01); c) "The main challenge with the consultations is the delays. It's the biggest issue because it delays them, and then it delays our consultation." (ID03); d) "I think the worst part is the waiting time. Even with the entertainers, sometimes the children have had their faces painted, they have got a balloon, they have done everything, and then the parents start to lose patience after ten minutes." (FGA2).

4.3.1 b) Interactive Sensory Engagement in Reducing Perceived Waiting Time

Interactive and engaging sensory elements were highly influential in shaping caregivers' perceptions of waiting time. Caregivers who observed their children being occupied with activities such as drawing, playing in the wooden playhouse, or exploring various tactile features were significantly less likely to express concerns about the wait duration. This highlights the pivotal role that a well-designed multi-sensory environment plays in maintaining child engagement and alleviating the perceived burden of waiting.

By transforming passive waiting into a stimulating and enjoyable experience, these sensory elements mitigated caregiver frustration and fostered a more positive overall experience for families. This dynamic interaction between the environment and paediatric patient engagement enhanced caregivers' perceptions of the quality of care provided, reinforcing the notion that thoughtful, sensory-driven interventions can substantially improve emotional well-being and satisfaction within healthcare settings.

Supporting Evidence: a) "The parents appeared patient, waiting calmly without making any additional inquiries to the staff." (O19); b) "This really helps because sometimes the wait is long due to unforeseen

circumstances in the medical profession. Time passes faster because we can't plan and bring many activities to the hospital." (IC04); c) "It keeps her entertained, which helps to calm the waiting times, which can sometimes be a bit long. But it is not overly stimulating, so I think it is a good balance." (IC05).

4.4 Summary of Findings

Integrating multi-sensory marketing techniques played a pivotal role in shaping perceptions of service quality within the paediatric department. By thoughtfully curating sensory elements such as soothing scents, calming visuals, and engaging tactile interactions, the hospital created a care environment that was perceived as both hygienic and welcoming. These sensory enhancements elevated the physical ambiance and communicated a solid commitment to patient-centred care, reflecting meticulous attention to detail and emotional sensitivity. Caregivers reported feeling more at ease and satisfied, indicating that these sensory elements were critical in fostering a perception of high-quality service and better coping with long waiting times. By reinforcing the hospital's brand as a provider of compassionate and high-standard healthcare, the strategic application of multi-sensory design fostered deeper trust and loyalty, thereby elevating the perceived quality of care in the minds of both patients and caregivers.

4.5 Linking Findings to the Research Objectives

The findings from this research strongly align with the research objectives and directly address the research question, "How do multi-sensory marketing techniques influence perceived service quality in the paediatric department of Hospital da Luz Lisboa?". Analyzing the data makes it clear that multi-sensory marketing interventions have a profound and measurable impact on the perceived service quality, as demonstrated through the themes studied. The research shows that multi-sensory elements are instrumental in shaping perceptions of service quality. The findings from Theme One reveal that caregivers consistently viewed the sensory-rich environment as indicative of high-quality, patient-centred care. The thoughtful design and attention to sensory detail communicated the hospital's commitment to patient well-being, directly influencing service quality perceptions. This is a critical link to the research question, demonstrating that

multi-sensory interventions are not merely aesthetic but significantly impact how caregivers perceive the quality of care delivered in the paediatric department.

Moreover, Theme Two underscores the role of sensory stimuli in managing perceptions of waiting time. Caregivers consistently reported that engaging sensory elements contributed to a more relaxed environment, alleviating stress and enhancing overall satisfaction. The ability of these stimuli to occupy and calm children transformed the waiting period into a more manageable experience. This insight aligns with the objective of examining how multi-sensory techniques can mitigate the adverse effects of extended waiting times, thereby elevating overall service satisfaction. By addressing both the emotional and psychological needs of paediatric patients and their caregivers, these sensory interventions have cultivated a perception of compassionate, high-quality care, reinforcing the direct influence of multi-sensory marketing techniques on service quality perception. The discussion section will delve deeper into the significance of these findings, exploring how each sensory theme impacts service quality perception in healthcare.

4.6 Comparison and Contrast of Perceptions of Multi-Sensory Engagement: Caregivers vs. Hospital Staff

The comparison of perceptions between caregivers and hospital staff on multi-sensory engagement in the paediatric department revealed key differences. Caregivers appreciated sensory interventions, finding that calming visual and sensory elements made the environment more comfortable, easing anxiety and enhancing their experience. This positive shift contributed to a better perception of service quality and mitigated the negative impact of long waits, as caregivers felt entertained children made the time pass more quickly. Hospital staff, while recognizing the benefits of sensory engagement, noted practical challenges in maintaining these elements. Visual aesthetics required regular updates to stay effective, and repetitive background music, though calming, became monotonous during long shifts. Staff also emphasized the importance of hygiene in tactile play areas, especially during flu seasons, highlighting the balance needed between interactive experiences and infection control.

Supporting Evidence: "And regarding the visuals, (...) sometimes the children don't even know what animals they are. (...) So I think that means there should be an adjustment in the animal stickers." (FGA2); a) "That is the challenge with toys too; they tend to vanish, and then there is also the concern about hygiene and the spread of germs." (FGA3). b) "I believe these elements could definitely reduce complaints, particularly those related to waiting times." (FGA3).

5. DISCUSSION

5.1 Introduction

According to the Findings section, caregivers noted that the vibrant colours and nature-inspired decor in the paediatric waiting area contributed to a perception of cleanliness and professionalism. By creating a visually appealing and orderly space, these elements fostered a sense of high-quality service and attentiveness, aligning with the hospital's objective of instilling trust and satisfaction among patients and their families. Perceived quality is a critical concept in healthcare, referring to patients' and caregivers' evaluations of the services they receive, which encompasses both clinical outcomes and the non-clinical environment (Dagger, Sweeney & Johnson, 2007). In paediatric care, perceived quality becomes even more vital due to the heightened emotional and psychological needs of both children and their caregivers. Paediatric patients are often more sensitive to environmental factors, while caregivers evaluate the quality of the healthcare service based on both their children's reactions and their own experience within the hospital. In this context, multi-sensory marketing techniques, which engage the senses of sight, sound, smell, and touch, can play a pivotal role in shaping these perceptions. Perceived quality is also intricately linked to patient satisfaction and long-term loyalty, which are crucial in a healthcare system where patients and their families have choices in service providers. High perceived quality not only fosters patient trust and retention but also contributes to positive word-of-mouth, which is particularly influential in paediatric healthcare, where emotional well-being and trust in caregivers play dominant roles.

5.2 Interpretation of Findings

5.2.1 Visual Elements and Perceived Environment

The findings from the research indicate that visual elements such as vibrant décor, playful imagery, and the strategic use of natural light had a significant positive impact on perceived quality. Caregivers frequently commented on the child-friendly design of the waiting area, noting that it helped to create a more welcoming and less intimidating environment. The use of bright colours and nature-themed designs was particularly effective in reducing anxiety among both children and their caregivers. These visual elements align with the SERVQUAL dimension of "tangibles," as they reflect the hospital's attentiveness to creating an environment that feels safe, comfortable, and engaging for young patients. In addition, the presence of natural light not only contributed to a sense of openness but also had a calming effect, as reported by caregivers. Research in environmental psychology has consistently shown that natural light can positively affect mood and reduce stress (Ulrich, 1991). In this research, caregivers often mentioned that the waiting room felt less clinical and more like a comforting space, which enhanced their overall perception of the hospital's service quality.

5.2.2 Auditory Components and Perceived Care

As identified in the Findings section, caregivers frequently associated background music with a sense of quality and care, highlighting its role in crafting a professional and soothing environment. However, some caregivers and hospital staff noted that noise control remained essential for sustaining this impression, particularly during busier hours. These findings also suggest that effective auditory design can enhance perceptions of quality if sound levels are managed effectively. Auditory elements played an important role in shaping perceived quality. Calming background music, such as nature sounds, was implemented to create a serene atmosphere in the paediatric waiting area. Caregivers reported that the music helped to reduce anxiety and create a more relaxed environment for themselves and their children. However, during peak times, noise from crying children or crowded waiting areas often overpowered the calming effects of the background music, detracting from the overall auditory experience. The inconsistency in the auditory

environment suggests that while calming sounds can enhance perceptions of quality, hospitals must also manage ambient noise levels to maintain a tranquil atmosphere. This aligns with the SERVQUAL dimension of "empathy," as hospitals that successfully create a peaceful auditory environment demonstrate an understanding of the emotional needs of both patients and caregivers.

5.2.3 Olfactory Influence and Perceived Cleanliness

The role of scent in shaping perceptions of cleanliness and comfort was another key finding. The introduction of pleasant, subtle fragrances, such as floral or fresh scents, was found to significantly improve caregivers' perceptions of the hospital's cleanliness. Caregivers and hospital staff frequently noted that the pleasant smells helped to mask the typical clinical odors associated with hospitals, making the space feel more welcoming and less sterile. This improvement in perceived cleanliness also enhanced their overall sense of comfort and trust in the hospital's ability to maintain a high standard of care. This finding supports previous research on the role of olfactory cues in healthcare environments, where pleasant scents have been shown to reduce patient anxiety and improve satisfaction (Ulrich et al., 2008). By addressing the SERVQUAL dimension of "tangibles," olfactory elements help reinforce the hospital's commitment to providing a high-quality and well-maintained environment.

5.2.4 Tactile Elements and Perceived Responsiveness

As reported in the Findings section, interactive play areas not only engaged children but also contributed positively to caregivers' perceptions of a high-quality, thoughtful care environment. Caregivers associated these tactile elements with a hospital that is attentive to patients' needs and dedicated to creating a supportive experience, reflecting the hospital's emphasis on patient-centred service. Tactile elements, such as play areas, toys and interactive features, were highly appreciated by caregivers. These elements provided children with distractions, reducing their restlessness and anxiety during waiting times. Caregivers perceived the presence of these tactile features as a sign that the hospital was responsive to the needs of paediatric patients. This aligns with the SERVQUAL dimensions of "responsiveness" and "empathy," as the hospital demonstrated a commitment to addressing the emotional and developmental needs of young patients by creating engaging,

interactive environments. In particular, the wooden playhouse and drawing stations allowed children to remain occupied and entertained during long waits, which in turn reduced caregiver stress. This suggests that tactile engagement is a critical component of perceived service quality in paediatric healthcare, as it directly addresses the needs of both patients and caregivers.

5.3 Theoretical and Practical Implications

This research offers new insights into the impact of olfactory and tactile elements on shaping quality perceptions in paediatric healthcare. While previous studies have focused primarily on visual and auditory stimuli, this research underscores the importance of scent and touch in creating a holistic sensory experience. The use of pleasant scents to enhance perceptions of cleanliness is a novel finding that expands the understanding of how sensory stimuli can influence patient satisfaction in healthcare settings. Additionally, the research highlights the critical role of tactile engagement in paediatric care. By providing children with interactive play areas, hospitals can significantly improve the waiting experience, reducing anxiety for both children and caregivers. This finding suggests that tactile engagement is an essential but often overlooked component of perceived quality in healthcare environments, particularly in paediatric settings.

The practical implications of this research are clear: hospitals can significantly improve perceived service quality by integrating sensory marketing techniques into their paediatric environments. Key recommendations include:

a) Visual and Auditory Design: Hospitals should focus on creating visually appealing and auditorily soothing environments. Child-friendly décor, vibrant colours, and calming background music can reduce anxiety and improve overall perceptions of quality. However, noise control measures should be implemented to ensure that the auditory environment remains peaceful, even during peak times.

b) Olfactory Enhancements: Subtle, pleasant scents can enhance perceptions of cleanliness and comfort, helping to reduce the sterile feel of hospital environments. Hospitals should consider introducing light fragrances into waiting areas to create a more welcoming atmosphere.

c) Tactile Engagement: Based on caregiver and medical staff feedback, it is essential for Hospitals to provide tactile elements, such as interactive play areas (including for children under 1 year old) and drawing stations in paediatric care settings. These elements not only engage children during extended waiting periods but also reduce anxiety, thereby improving the overall caregiver experience. Caregivers have expressed that such features are crucial in creating a child-friendly and emotionally supportive environment.

d) Staff Training on Sensory Engagement: In addition to designing sensory-rich environments, healthcare staff should be trained to understand the impact of sensory stimuli on patient well-being. This will help medical professionals more effectively engage with patients in a way that complements the multi-sensory approach, ensuring that every interaction aligns with the overall calming environment.

5.4 Conclusions

This research has demonstrated that multi-sensory marketing techniques, particularly the integration of visual, auditory, olfactory, and tactile elements, significantly enhance the perceived service quality in paediatric healthcare environments. These sensory elements, when effectively incorporated into healthcare settings, create emotionally supportive environments that foster comfort and reduce anxiety among paediatric patients and their caregivers, enabling them to better tolerate long waiting times. Visual stimuli such as bright, child-friendly décor and natural light, auditory stimuli like calming music, pleasant olfactory cues and interactive tactile experiences have all contributed to shaping positive perceptions of healthcare quality. The research also revealed a strong link between sensory engagement and emotional well-being in paediatric care settings. By addressing both the emotional and physical needs of patients, hospitals not only improve the overall patient experience but also foster long-term satisfaction and trust in healthcare services. These findings reinforce the relevance of environmental psychology and the SERVQUAL model, highlighting the critical role of sensory elements in enhancing both tangible and intangible service dimensions in paediatric healthcare.

6. LIMITATIONS AND RECOMMENDATIONS

6.1 Limitations of the Research

The research is limited in terms of generalizability, as it was conducted within a single paediatric department at Hospital da Luz Lisboa, making it difficult to apply findings to other healthcare environments, especially those differing in cultural or socio-economic contexts. Additionally, the study's sensory focus was somewhat narrow, covering visual, auditory, olfactory, and tactile stimuli while excluding others like taste, which could play a role in settings involving food. The short-term nature of the study also poses a limitation; it only examined immediate perceptions, leaving out the potential long-term effects of sensory stimuli on patient satisfaction and emotional well-being. The limited sample size and lack of direct feedback from paediatric patients further restrict the study's insights, as these factors could provide a fuller understanding of sensory marketing impacts.

6.2 Recommendations for Future Research

Future research should prioritize a broader generalizability by examining different cultural and healthcare settings, which would help validate the findings across diverse backgrounds. Expanding the scope of sensory elements to include stimuli such as taste, alongside personal sensory preferences, would offer a more comprehensive picture of sensory engagement's influence. Longitudinal studies tracking patient experiences over time are essential to assess whether sensory interventions yield sustained improvements in satisfaction and outcomes. Including direct input from paediatric patients would also enable researchers to tailor sensory interventions more closely to their needs.

6.3 Final Remarks

This research demonstrates that multi-sensory marketing significantly enhances service quality in paediatric healthcare by creating environments that support both physical and emotional well-being for patients and caregivers. Engaging senses such as sight, sound, smell, and touch promote patient-centred care, aligning with principles from environmental psychology and the SERVQUAL model. Despite some limitations, the study lays a foundation for future research

into the broader, long-term, and cross-cultural effects of sensory techniques in healthcare. Sensory engagement proves to be a vital element of patient well-being, essential for evolving paediatric healthcare to be both supportive and attuned to patients' complex needs.

7. ETHICAL CONSIDERATIONS

Ethical considerations played a crucial role in this study, particularly due to the involvement of paediatric patients. Informed consent was carefully obtained, with written or recorded consent from adult participants and parental or guardian consent for minors. Participants were fully informed about the research's purpose, risks, and benefits. Confidentiality was rigorously maintained, with data stored securely and anonymized in reports. The research design prioritized minimizing harm, conducting interactions in supportive, child-friendly environments and carefully selecting participants to avoid any undue distress, especially for caregivers with children in sensitive health conditions.

8. REFERENCES

Antunes, I. F. S., and J. M. C. Veríssimo. "A Bibliometric Review and Content Analysis of Research Trends in Sensory Marketing." *Cogent Business & Management* 11, no. 1 (2024): 2338879. https://doi.org/10.1080/23311975.2024.2338879.

Berry, L. L., and N. Bendapudi. "Health Care: A Fertile Field for Service Research." *Journal of Service Research* 10, no. 2 (2007): 111-122. https://doi.org/10.1177/1094670507306683.

Bertil, H. "Sensory Marketing: The Multi-sensory Brand-experience Concept." *European Business Review* 23, no. 3 (2011): 256-273. https://doi.org/10.1108/09555341111130245.

Bhatia, R., and R. Garg. "Sensory Marketing - A Review and Research Agenda." *Academy of Marketing Studies Journal*25, no. 4 (2021).

Biswas, D., K. Lund, and C. Szocs. "Sounds Like a Healthy Retail Atmospheric Strategy: Effects of Ambient Music and Background Noise on Food Sales." *Journal of the Academy of Marketing Science* 47, no. 1 (2019): 37-55.

Braun, V., and V. Clarke. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3, no. 2 (2006): 77-101.

Creswell, J. W., and V. L. Plano Clark. *Designing and Conducting Mixed Methods Research*. 2nd ed. Thousand Oaks, CA: SAGE Publications, 2011.

Dagger, T. S., Sweeney, J. C., & Johnson, L. W. "A hierarchical model of health service quality: Scale development and investigation of an integrated model." *Journal of Service Research*, 10(2), (2007):123–142.

Denzin, N. K. *The Research Act: A Theoretical Introduction to Sociological Methods*. 2nd ed. New York: McGraw-Hill, 1978.

Etikan, I., S. A. Musa, and R. S. Alkassim. "Comparison of Convenience Sampling and Purposive Sampling." *American Journal of Theoretical and Applied Statistics* 5, no. 1 (2016): 1-4.

Fürst, A., E. Gruber, and T. Schlager. "Multisensory Marketing: Effects of Promotional Scents and Auditory Stimuli on Consumer Responses." *Journal of Business Research* 122 (2021): 54-65.

Gould van Praag, C. D., Garfinkel, S. N., Sparasci, O., Mees, A., Philippides, A. O., Ware, M., Ottaviani, C., & Critchley, H. D. "Mind-wandering and alterations to default mode network connectivity when listening to naturalistic versus artificial sounds." *Scientific Reports*, 7, Article 45273, 2017.

Hammersley, M., & Atkinson, P. *Ethnography: Principles in Practice* (3ª ed.). Routledge, 2007.

Holbrook, M. B., and E. C. Hirschman. "The Experiential Aspects of Consumption: Consumer Fantasies, Feelings, and Fun." *Journal of Consumer Research* 9, no. 2 (1982): 132-140.

Hultén, B. "Sensory Marketing: The Multi-sensory Brand-experience Concept." *European Business Review* 23, no. 3 (2011): 256-273. https://doi.org/10.1108/09555341111130245.

Hultén, B., N. Broweus, and M. van Dijk. *Sensory Marketing: Research and Applications*. West Sussex: John Wiley & Sons, 2009.

Kim, J., H. Lee, and D. Shin. "The Impact of Multi-sensory Marketing on Customer Satisfaction and Loyalty in the Hospitality Industry." *International Journal of Hospitality Management* 93 (2021): 102759.

Krishna, A. "An Integrative Review of Sensory Marketing: Engaging the Senses to Affect Perception, Judgment, and Behaviour." *Journal of Marketing* 75, no. 1 (2011): 19-41.

Krishna, A. "An Integrative Review of Sensory Marketing: Engaging the Senses to Affect Perception, Judgment, and Behaviour." *Journal of Consumer Psychology* 22, no. 3 (2012): 332-351.

Krishna, A. *Customer Sense: How the 5 Senses Influence Buying Behaviour*. New York: Palgrave Macmillan, 2013.

Krishna, A., and N. Schwarz. "Sensory Marketing, Embodiment, and Grounded Cognition: A Review and Introduction." *Journal of Consumer Psychology* (2013).

Krupka, Z. "Exploring the Influence of Sensory Marketing on Brand Perception." *Naše Gospodarstvo/Our Economy* 69, no. 3 (2023): 45-55. https://doi.org/10.2478/ngoe-2023-0017.

Lindstrom, M. *Brand Sense: How to Create Sensory Experiences That Will Revolutionize Your Business*. New York: Doubleday Financial, 2005.

Mattila, A. S., and J. Wirtz. "Congruency of Scent and Music as a Driver of In-store Evaluations and Behaviour." *Journal of Retailing* 77, no. 2 (2001): 273-289. https://doi.org/10.1016/S0022-4359(01)00039-6.

Palinkas, L. A., S. M. Horwitz, C. A. Green, J. P. Wisdom, N. Duan, and K. Hoagwood. "Purposeful Sampling for Qualitative Data Collection and Analysis in Mixed Method Implementation Research." *Administration and Policy in Mental Health and Mental Health Services Research* 42, no. 5 (2015): 533-544.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality." Journal of Retailing, 64(1), (1988): 12–40

Patton, M. Q. *Qualitative Research & Evaluation Methods*. 3rd ed. Thousand Oaks, CA: SAGE Publications, 2002.

Pham Thi, H. "The Role of Multi-sensory Experience Toward Perceived Medical Service Quality: A Research at Vietnam Public Hospital." *International Journal of Healthcare and Management* 16, no. 2 (2013): 226-239.

Riza, A., and D. Wijayanti. "The Triangle of Sensory Marketing Model: Does It Stimulate Brand Experience and Loyalty?" *Esensi Jurnal Bisnis dan Manajemen* 8, no. 1 (2018).

Saunders, M., P. Lewis, and A. Thornhill. *Research Methods for Business Students*. 9th ed. Harlow, UK: Pearson, 2023.

Sausen, J. F. C. L. "Marketing Sensorial e Humanização na Saúde: Influências na Recuperação do Paciente Infantil pela Percepção dos Técnicos de Enfermagem." *Revista Brasileira de Enfermagem* 71, no. 3 (2018): 596-605.

Sausen, J. F. C. L., D. K. Baggio, L. M. S. Froemming, and N. R. C. Bussier. "Dimensões do Marketing Sensorial e Humanização em Pediatrias Hospitalares: Estudo de Satisfação dos Acompanhantes." *Revista Economia & Gestão*, January–April 2023.

Satti, J. A., M. R. Shams, and S. A. Raza. "The Role of Multi-sensory Marketing in Enhancing Customer Satisfaction and Brand Loyalty." *Journal of Marketing Management* 38, no. 5-6 (2022): 687-705.

Ulrich, R. S. "Effects of Interior Design on Wellness: Theory and Recent Scientific Research." *Journal of Health Care Interior Design* 3, no. 1 (1991): 97-109.

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., Quan, X., & Joseph, A. "A review of the research literature on evidence-based healthcare design." *HERD: Health Environments Research & Design Journal*, 1(3), (2008): 61–125.

9. APPENDICES

Appendix A - Sensory elements in the waiting room

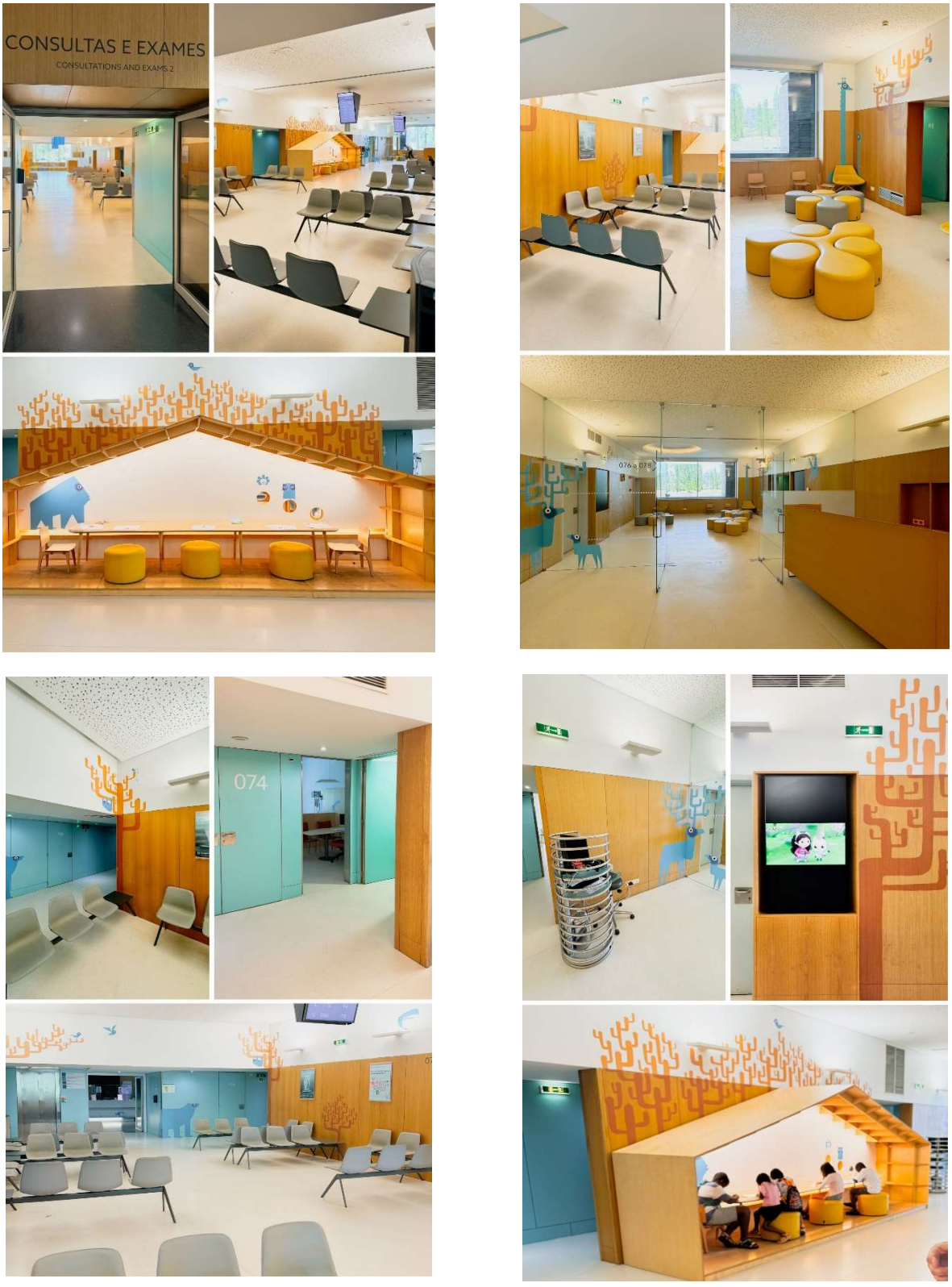

Figure 1 - Paediatric waiting room of Hospital da Luz Lisboa

Figure 2 - Pencils and LU colouring book

isensis perfume design

FICHA TÉCNICA DE DIFUSOR DE PERFUMES

n-sensis

ESPECIFICAÇÕES

Descrição:	equipamento eléctrico para difusão de perfumes no ar
Dimensões:	200 x 95 x 260 mm (base x altura)
Peso:	3.3 kg
Fonte de alimentação:	corrente de entrada: 210-240 VAC, 50 Hz, 14 W corrente de saída: 12 VDC, 1.25 A
Condições de operação:	temperatura: 0 ° a 40 °C humidade: <85%
Instalação:	O equipamento deve ser colocado sobre uma superfície horizontal ou afixado numa superfície vertical, em espaço interior (indoor use). Deve ter caixa de protecção especial para utilização no exterior.
Capacidade das recargas:	500 ml

i-sensis perfume design, lda
Rua Clube Desportivo do Candal, 143 Fracção E | 4400-693 Vila Nova de Gaia PORTUGAL
Tlf: +351 223 260 659 | E-mail: info@i-sensis.com | Webpage: http://www.i-sensis.com
Capital Social 30 000€ | Matriculada na C.R.C. S. João da Madeira | NIF 507 015 274

i-sensis perfume design

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4400-693 vila nova de gaia. portugal
tel. +351 223260659
info@i-sensis.com
www.i-sensis.com

Certificado de conformidade e segurança

i-sensis perfume design, Lda certifica que todas as nossas fragrâncias utilizam essências de elevada qualidade, seguras e de origem não-animal. As essências são provenientes de fornecedores da UE e cumprem as normas definidas pela entidade *International Fragrance Association* (IFRA), que regulamenta a nível europeu a quantidade máxima de essência a utilizar em cada tipo de produto perfumado, para uso corporal, cosméticos, ambientadores e/ou aromatização de espaços, com e/ou sem contacto com a pele.

As normas restritivas IFRA são baseadas em avaliações de segurança para a saúde humana, realizadas pelo Painel de Peritos do *Research Institute For Fragrance Materials* (RIFM) e pelo comité científico do próprio IFRA .

Todos os nossos produtos são notificados ao *Centro de Informação Anti-Venenos* (CIAV), sendo indicado a respetiva formulação-quadro e a lista de ingredientes potencialmente alergéneos. No caso de perfumes de uso corporal, estes também são notificados ao INFARMED e sujeitos a testes dermatológicos num laboratório acreditado.

Os equipamentos de aromatização da i-sensis perfume design – difusores de perfumes – promovem a difusão de perfumes para o ar ambiente, utilizando a tecnologia de difusão a frio, em que a fragrância é transformada diretamente num vapor muito fino, que se mantém em suspensão no ar e se difunde no espaço envolvente. Não é utilizada temperatura, aerossóis ou qualquer tipo de solvente nocivo, tóxico ou irritante.

Foram efetuados ensaios de qualidade do ar aromatizado pelo laboratório de ensaios do CTCP (laboratório acreditado segundo a norma ISO17.025), em condições de utilização extremamente intensivas (espaço fechado 40 m², durante 24H, com intensidade de fragrância elevada), **não tendo sido detectada a presença de qualquer composto orgânico volátil** (COV) no ar.

Vila Nova de Gaia, 01 de Janeiro de 2018

Paula Gomes
direcção técnica da i-sensis

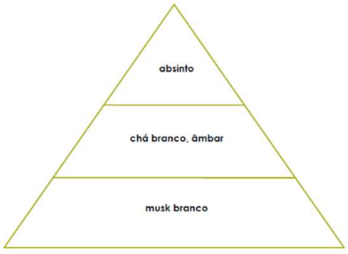
Descrição olfactiva do perfume

WHITE RITUAL

Descrição

a suavidade e leveza do chá branco

Pirâmide olfactiva



I-SENSIS
PERFUME DESIGN

Figure 3 - Characteristics of aroma diffusion

(21) Relaxing Zen Music 24/7, Healing Music, Meditation Music, Spa Music, Sleep, Zen, Nature Sounds - YouTube

(21) 432 Hz - O som Zen Tibetano cura todo o corpo, cura emocional, mental e espiritual #14 - YouTube

Reference links 1 - Used sound samples

Appendix B - Observation structure

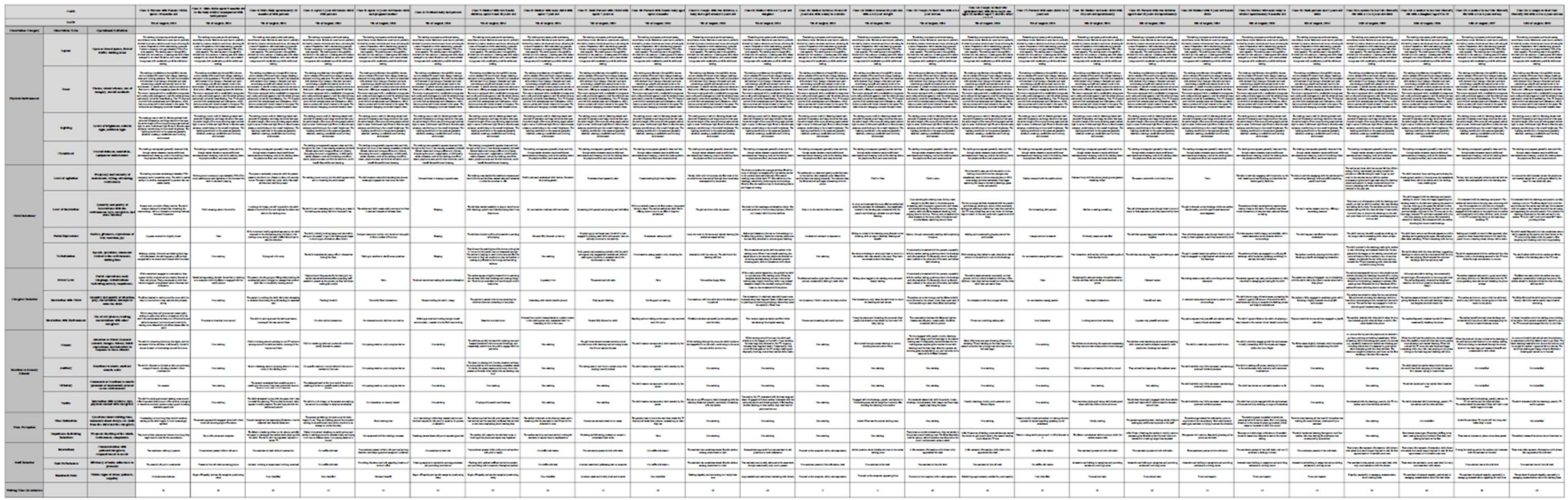


Table 1 - Observation structure and note

Appendix C - Caregivers Interview Guide

"Introduction (3 minutes) Good morning/afternoon/evening.

My name is _____, and I am currently a Master's student in Marketing and Strategy at NOVA School of Business and Economics. For my master's thesis, we are conducting research in collaboration with Hospital da Luz Lisboa on the impact of sensory marketing on the experience of paediatric patients in a hospital setting.

For this purpose, I would like to interview you for approximately 10 minutes through a semi-structured interview, which means I will ask you several questions for which there are no right or wrong answers, and you are free to express your thoughts on the subject.

For the purpose of analysing our interviews later, I would like to record our conversation - would that be alright? The recording will remain anonymous, and in accordance with the General Data Protection Regulation (GDPR) of May 2018, you will not be contacted after this interview.

General (5 minutes)

- Do you frequently accompany the patient to their appointments and exams at Hospital da Luz Lisboa, or is this your first time?
- Generally speaking, how would you describe your experience and the patient's experience today at Hospital da Luz Lisboa?
- How does today's experience compare to previous experiences in the Paediatrics department at Hospital da Luz Lisboa?
- How did the environment of the Paediatrics waiting room make you feel in terms of comfort and well-being? What impact did it have on the patient?

Smell (3 minutes)

- Did you notice any specific smell/aroma in the Paediatrics waiting room?
- How did this aroma make you feel? And the patient you are accompanying?
- Do you think the aromas have any effect on your (and the patient's) well-being or level of comfort?

Sound (3 minutes)

- What did you think of the ambient sound in the Paediatric´s waiting room?
- How did the ambient sound affect the patient's experience and your own experience while waiting?
- Do you think the ambient sound has any effect on your (and the patient's) well-being or level of comfort while waiting?

Visual Elements (3 minutes)

- What is your opinion about the visual aspect (mention the images on the walls, the wooden house, and the screen with the Panda channel) in the Paediatric´s waiting room?
- How do you think these visual elements impact the mood and well-being of the person you are accompanying while waiting?
- Do you have any suggestions for improving the visual environment in the waiting room?

Touch (3 minutes)

- Did you notice the presence of toys, games, colouring books, and coloured pencils in the Paediatric´s waiting room?
- How do you think these elements might impact your child's experience while waiting?

- Do you have any suggestions for other tactile elements that could contribute to improving the experience of patients while waiting?

Perceived Quality and Satisfaction (3 minutes)

- Do the sensory elements you experienced (smells, sound, visuals, touch) affect your perception of the quality of the Paediatric´s service at Hospital da Luz Lisboa?
- Do the sensory elements you experienced (smells, sound, visuals, touch) affect your level of satisfaction with the Paediatric´s service at Hospital da Luz Lisboa?
- Based on your sensory experience, would you recommend the Paediatric´s service at Hospital da Luz Lisboa to friends and family? Why?

We are approaching the end of the interview. I would like to ask you a few final, very simple questions to help us characterize our sample.

- Age of the caregiver?
- Gender of the caregiver?
- Nationality of the caregiver?
- Age of the patient?
- Gender of the patient?
- What is the caregiver's relationship with the patient?
- Do you frequently come with the patient to his/her appointments and exams at Hospital da Luz Lisboa, or is this your first time?

Closing (1 minute)

Thank you very much for your time and willingness to participate—your opinions are really important to us as we aim to improve our customers' experience.

Do you have any questions, comments, or suggestions you would like to share?

Thank you again and have a great day!"

Appendix D - Doctors Interview Guide

Considerations

Target Audience**:** Doctors and nurses working in the Paediatrics Department of Hospital da Luz Lisboa

Objective**:** To assess perceptions of the work environment following the implementation of sensory marketing, identifying impacts on the experiences of professionals and on patient care, as well as their companions.

Questions may be adapted according to the profile of the interviewee.

Interview Structure

Introduction (5 minutes)

Introduce and explain the purpose of the interview.

Establish a comfortable and welcoming environment.

Explain the importance of participation and ensure the confidentiality of responses.

General (15 minutes)

How would you describe the environment of the waiting room in the Paediatrics Department?

How would you characterise the experience of patients and their companions in this environment?

What are the main challenges or difficulties faced daily with patients and their companions?

Have you noticed any difference in recent weeks in the behaviour of patients and companions in the waiting room or in their disposition when they arrive for consultations?

Have you heard or received any direct feedback from patients and companions about sensory elements (smell, sound, visual, touch) in the waiting room?

Is there anything you would like to change in the waiting room environment of the Paediatrics

Department?

Do you believe the sensory elements experienced by patients and their companions (smells, sound, visual, touch) affect their perception of the quality of service provided by the Paediatrics unit at Hospital da Luz Lisboa?

Do you think the sensory elements experienced by patients and their companions (smells, sound, visual, touch) affect their level of satisfaction with the Paediatrics service at Hospital da Luz Lisboa?

Conclusion (5 minutes)

Thank the participant for their time and input.

Reaffirm the importance of their responses for the study.

Inform them about the next steps in the research and how the results will be used.

Appendix E - Focus Group Guide

“Duration: 1h

Moderator’s Introduction

Good morning, everyone!

First and foremost, I would like to thank each of you for being here today. It is a pleasure to have you with us in this focus group, which aims to discuss the impact of sensory marketing on the experience of our paediatric patients and their accompanying family members in the Paediatrics waiting room.

As you know, creating a welcoming and positive environment is crucial for the well-being of the children and families who visit our Paediatrics service. That’s exactly why we are here: to hear your perceptions, experiences, and suggestions on how we can further improve this important space.

As nurses, administrative professionals, and members of the management team, you have direct and privileged contact with our patients and their families. Therefore, your observations and feedback are vital in helping us understand the impact of sensory elements—such as smell, sound, visual elements, and touch—on the experience of those waiting for their appointments.

This is an open and safe space for sharing ideas and opinions. All contributions are welcome and will be treated with the utmost confidentiality. Our goal is to build, together, an even more welcoming and humanized environment for our children and their families.

Once again, thank you all for participating. I am sure we will have a rich and productive discussion!

Let's get started!

General

- How would you describe the environment of the Paediatrics waiting room?
- How would you characterize the experience of patients and their families in this environment?
- What are the main challenges or difficulties faced daily with patients and their families?
- Have you noticed any changes in the behaviour of patients and their families in the waiting room in recent weeks?

- Have you heard or received any direct comments from patients and families about the sensory elements (smell, sound, visual, touch) in the waiting room?

- Is there anything you would like to change about the Paediatrics waiting room environment?

Scent

- How do you think the fragrances used have impacted the environment of the Paediatrics waiting room?

- Have you observed any reactions from patients and families to these smells in the waiting room?

Sound

- Can you describe the environment in the waiting room with the implementation of ambient sound?

- What is the impact on patients and their families?

- Have you received any positive or negative feedback from clients regarding the ambient sound in the waiting room?

Visual Elements

- How would you describe the visual design of the Paediatrics waiting room?

- What is the impact of various visual elements (e.g., the images on the walls, the wooden house, and the screen with the Panda channel) on patients and their families while they wait?

- Have you received any feedback from clients about the visual environment in the waiting room?

Touch

- What do you consider to be the most impactful tactile elements in the Paediatrics waiting room (e.g., toys, games, colouring books, crayons, etc.) for patients and their families?

- How do you think these elements affect the experience of patients and caregivers?

- Have you received any specific feedback about the tactile elements in the waiting room?

Conclusion

We have reached the end of our session!

I want to thank each of you for your active participation and the valuable contributions you provided today. Your perceptions, experiences, and ideas are crucial in guiding us toward creating an even more welcoming and humanized waiting room for Paediatrics.

I am confident that the information and insights shared here will be of great value to our research and, most importantly, to the continuous improvement of our service. We believe that by optimizing the sensory elements of the environment, we can positively impact the experience of the children and families who visit our hospital.

Once again, thank you for your availability and collaboration. Please know that your voices are heard, and we will do our best to implement feasible and appropriate improvements for our service.

I wish you all an excellent day!"

Appendix F - Themes and Sub-Themes Derived from Data

Theme	Subtheme A	Subtheme B
Theme One: The Role of Multi-Sensory Engagement in Service Quality Perception	The Impact of Sensory Elements on Perceived Service Quality	Increased Satisfaction and Trust through Sensory Engagement
Theme Two: The Role of Multi-Sensory Engagement in Managing Waiting Time Perception	Prolonged Waiting Time and Its Impact on Emotional Stress	Interactive Sensory Engagement in Reducing Perceived Waiting Time

Table 1 – Themes and Sub-themes

Code	Role	Age	Gender	Frequency in Paediatrics	Position	Nr of Paediatric Patient	Paediatric Patient Age	Paediatric Patient Gender
IC01	Caregiver	32	Female	1+	Mother	1	Newborn	Male
IC02	Caregiver	37	Male	1+	Father	2	1 3	Male Female
IC03	Caregiver	45	Female	1+	Mother	1	7	Male
IC04	Caregiver	37	Female	1+	Mother	1	0,5 5 8	Female Male Female
IC05	Caregiver	33	Female	1+	Mother	1	5	Female
IC06	Caregiver	67	Female	1+	Grandmother	1	10	Male
IC07	Caregiver	36	Female	1+	Mother	1	2	Male
IC08	Caregiver	39	Female	1+	Mother	3	1 7 10	Female Female Male
IC09	Caregiver	40	Female	1+	Mother	3	7 11 13	Male Male Male
IC10	Caregiver	29	Female	1	Mother	1	Newborn	Male
IC11	Caregiver	37	Female	1+	Mother	2	1 9	Male Female
IC12	Caregiver	35	Male	1+	Father	1	5	Male
IC13	Caregiver	38	Male	1+	Father	1	6	Male
IC14	Caregiver	40	Male	1+	Father	1	5	Female
IC15	Caregiver	42	Male	1+	Father	1	7	Male
IC16	Caregiver	38	Female	1+	Mother	1	Newborn	Female
IC17	Caregiver	43	Female	1+	Mother	1	11	Female
ID1	Paediatrition	52	Female	NA	NA	NA	NA	NA
ID2	Neonatologist	40	Female	NA	NA	NA	NA	NA
ID3	Paediatrition	61	Female	NA	NA	NA	NA	NA
ID4	Paediatrition	48	Male	NA	NA	NA	NA	NA
ID5	Pediatric psychologist	35	Female	NA	NA	NA	NA	NA
FGA1	Management	39	Female	NA	NA	NA	NA	NA
FGA2	Clinical Assistant	24	Female	NA	NA	NA	NA	NA
FGA3	Customer Service Technician	32	Female	NA	NA	NA	NA	NA
FGA4	Customer Service Technician	29	Female	NA	NA	NA	NA	NA
FGA5	Nurse	40	Female	NA	NA	NA	NA	NA

Nomenclature of the codes:

IC - Caregiver interview

ID - Doctor interview

FG - Focus Group participant

Table 2 - Target codification

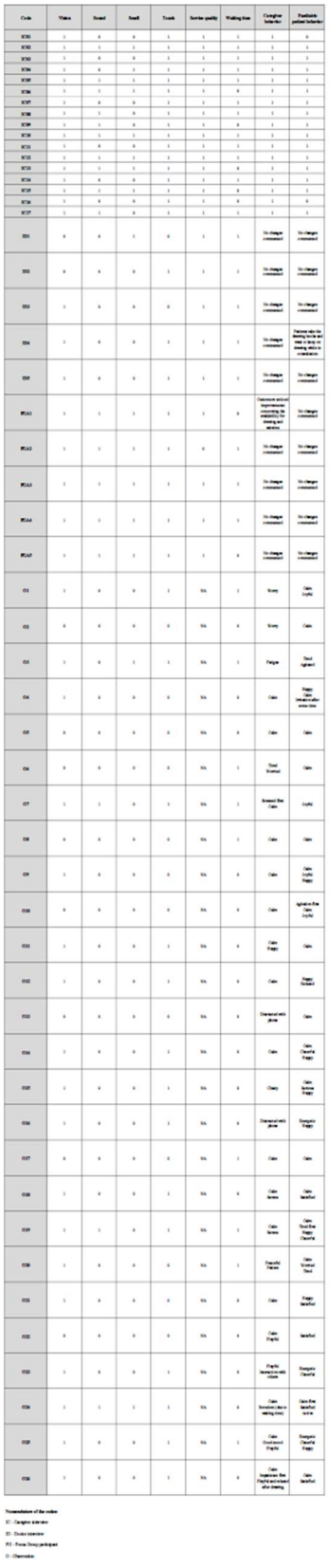


Table 3 - Positive impact mentioned or observed at least once in each code

Sensorial element	Total Codes*	Number of positive mentions	Percentage of positive mentions
Vision	27	25	93%
Sound	27	15	56%
Smell	27	14	52%
Touch	27	25	93%

* All except Observations

Table 4 - Cumulative positive mentions related to sensorial elements

Appendix G - Quotes

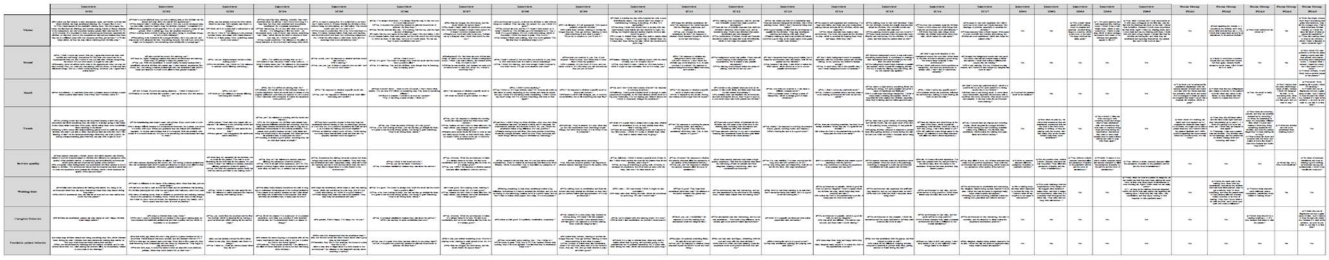


Table 1 - Quotes