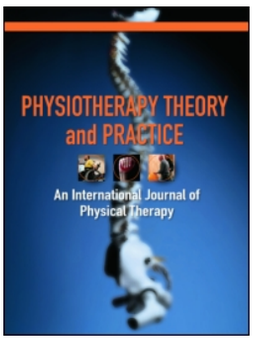

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Essence of the Bobath concept in the treatment of children with cerebral palsy. A qualitative study of the experience of Spanish therapists

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ABSTRACT

Objective: The aim was to explore the experiences of a group of Spanish physical therapists who apply the Bobath concept in the treatment of children with cerebral palsy, specifically to identify the components they experience as core and essential to the Bobath concept.
Design: A qualitative phenomenological study.
Methods: This study used purposive sampling. Non-structured interviews were carried out with 10 Spanish Bobath-trained physical therapists who treat children with cerebral palsy. Thematic analysis was applied.
Results: Five themes regarding the essence of the Bobath concept emerged: 1) "normal movement" as a guide; 2) a "global" concept; 3) observation; 4) the centrality of tone; and 5) working with families. Within these themes, additional principles were reflected cross-sectionally, such as therapy being a continuous process of assessment and treatment, the application of principles of motor learning, and the importance of carryover of treatment into function.
Conclusions: The results demonstrated themes traditionally identified as core to the Bobath concept, including working with families, which is also considered integral to the approach. The study participants used outdated terminology at times when discussing tone and movement. However, they reported that they no longer adhere to the theoretical perspective of pathological reflexes and reflex/tone inhibition. This study provides insight into how treatment of children with cerebral palsy based on the Bobath concept is experienced by a group of Spanish physiotherapists, who identified five main themes that they perceive as essential. The results provide grounds for further research into the application of the Bobath concept in children.

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Introduction

Cerebral palsy (CP) is the main cause of disability in children, with a prevalence of 2–3/1000 live births (Graham et al., 2016; Johnson and Surveillance of Cerebral Palsy in Europe (SCPE), 2002; Sellier et al., 2016). CP is defined as "a group of permanent disorders of the development of movement and posture, causing activity limitation that is attributed to non-progressive disturbances that occurred in the developing fetal or infant brain." The motor disorders of CP are often accompanied by disturbances of sensation, perception, cognition, communication and behavior, epilepsy and secondary musculoskeletal problems (Graham et al., 2016; Rosenbaum et al., 2007). Physical therapy is considered central to the management of children with CP (Franki et al., 2012a; Graham et al., 2016; Martin, Baker, and Harvey, 2010). The Bobath concept (BC) also known as Neurodevelopmental Treatment (NDT) is among the traditional therapy approaches most commonly used for motor intervention in CP (Marcroft et al., 2019; Morgan et al., 2016; Novak et al., 2013). The BC was developed by Berta and Karel Bobath between 1943 and their death in 1991, and introduced a holistic treatment approach that recognized the potential for functional change and skill learning in children with CP, as well as the potential risks of deterioration without adequate treatment (Bobath and Bobath, 1984). It was later applied to the treatment of adults with hemiplegia following stroke (Mayston, 2008a, 2008b; Tallis, 2009). The approach relied on observational, analytical and interpretive skills of the child´s activity by the therapist. The treatment during the early years of their work was based on therapeutic handling and facilitation principles with the following aims: to reduce the effect of abnormal tone; "inhibiting tone" in cases of

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spasticity; reduction of pathological reflexes; and the improvement of righting and balance reactions, all with the goal of enhancing everyday functioning. However, current literature relating to BC no longer refers to inhibition of tone and pathological reflexes (Mayston, 2001a, 2001b, 2008b; Raine, 2006; Vaughan-Graham et al., 2009). Indeed, in their lifetime the Bobaths realized that reflexes were inadequate to explain the atypical movement patterns encountered in children with CP (Bobath and Bobath, 1984). The child's activity, motivation and carry-over of treatment into daily life were also central to the concept in pediatrics and these original ideas remain current (Bobath, 1966; Bobath and Bobath, 1956, 1984; Mayston, 2008a, 2008b).

Treatment based on the teachings of the Bobaths has also been designated as Neurodevelopmental Treatment (NDT), which is the term used in North America and worldwide. It is widely accepted that the BC and NDT are part of the same treatment approach and are considered in the literature to be interchangeable approaches (Vaughan-Graham, Cott, and Wright, 2015a).

According to the definition of the Neuro-Developmental Treatment Association (NDTA) Instructors Group (2016), NDT is a holistic and interdisciplinary clinical practice model for habilitation and rehabilitation that emphasizes individualized therapeutic handling based on movement analysis. The therapist uses a problem-solving approach to assess activity and participation, thereby identifying and prioritizing relevant integrities and impairments as a basis for establishing achievable outcomes. Examination, evaluation, and intervention depend on an in-depth knowledge of the human movement system, an understanding of typical and atypical development and an analysis of postural control, movement, activity, and participation throughout the lifespan. Therapeutic handling aims to enable participation in meaningful activities. Another definition of the BC used until recently by the International Bobath Instructors Training Association (IBITA) is "a problem-solving approach to the assessment and treatment of individuals with disturbances of function, movement and tone due to a lesion of the central nervous system" (Michielsen et al., 2017; Raine, 2006, 2007; Vaughan-Graham et al., 2009). This definition highlighted "problem solving" and "function-movement-tone" as unique components of the BC, while the NDTA had already dropped any reference to "tone". IBITA members are instructors on Bobath courses for adult neurological rehabilitation in Europe and worldwide; an ongoing consensus-seeking process among IBITA instructors and the subgroup of the British Bobath Tutors Association (BBTA) was led and reported on by several researchers (Raine, 2006, 2007; Vaughan-Graham, Cott, and Wright, 2015a; Vaughan-Graham, Patterson, Zabjek, and Cott, 2017). These studies reflect the views of instructors – how they teach and practice the BC in adults. The ongoing process of redefining the BC and identifying its unique characteristics as viewed and experienced by Bobath instructors is described in detail in the most recent publication to date by Vaughan-Graham et al. (2019). The result is a complex framework that describes (rather than defines) the assessment and treatment process (Michielsen et al., 2017).

However, there are no current publications demonstrating a redefinition process taking place among tutors who teach on pediatric courses; neither has research been published regarding the way the BC is currently understood or applied in the treatment of children with CP. Some Bobath tutors have offered their views in letters to editors and in editorials (Capelovitch, 2014; Mayston, 2008a, 2008b, 2016), and two studies include, as part of a wider study, NDT treatment for children, although not specifically with CP (DeGangi and Royeen, 1994; Dirks, Blauw-Hospers, Hulshof, and Hadders-Algra, 2011).

It has been recognized that there is a wide variation in the application of the BC (DeGangi and Royeen, 1994; Marcroft et al., 2019; Mayston, 2008a, 2016; Mayston and Rosenbloom, 2014; Michielsen et al., 2017), which contributes to the difficulty in evaluating its effectiveness. Indeed, there is no conclusive evidence for the effectiveness of the BC or its superiority to other treatment approaches and methods (Anttila et al., 2008; Butler and Darrah, 2001; Franki et al., 2012b; Mayston, 2008a; Morgan et al., 2016; Novak et al., 2013; Vaughan-Graham and Cott, 2016). Research examining the BC has tended to be inconclusive or of poor quality for a number of reasons, including the diverse range of patient presentations, simultaneous use of various treatment approaches, the nature of the treatment applied in terms of fidelity or adherence, and the lack of adequate documentation of outcome measures (Martin, Baker, and Harvey, 2010; Mayston, 2005; Morgan et al., 2016; Vaughan-Graham, Cott, and Wright, 2015b). To date, no research has been published about how therapists use the BC as a framework in the treatment of children with CP. In an attempt to define how BC is used, IBITA instructors developed the Model of Bobath Clinical Practice (Michielsen et al., 2017). This model provides a framework intended to be applied in clinical practice, education, and research. The model emphasizes that the BC is inclusive and individualized, can be applied to individuals of all ages, to all degrees of physical and functional disability and is congruent with the International Classification of Functioning, Disability, and Health (Michielsen

et al., 2017). However, the lack of a consensus about the BC in the pediatric field of expertise may lead to its application being strongly based on therapist perspective and experience.

In Spain, physical therapists (PTs) who have completed advanced pediatric Bobath training might share a unique understanding of what it means to apply the BC. Therefore, our objective in this study was to describe what this group of PTs perceives as the core aspects of the BC when treating children with CP. This description could be a starting point for future inquiries into the nature and content of treatment provided by Bobath-trained therapists.

Methods

Design

A qualitative phenomenological descriptive design, following Husserl's framework, was carried out to explore the experiences of Spanish PTs who apply the BC in the treatment of children with CP. In the field of qualitative studies, phenomenology attempts to understand the essence of the lived experiences of individuals, which is the subjective reflection of human beings when taking part in events in a specific space and time (Carpenter and Suto, 2008; Norlyk and Harder, 2010). This experience always has a meaning for the person who has undergone the same and, thus, phenomenological research uses first-person narratives such as personal letters and diaries (Carpenter and Suto, 2008) from the participants themselves as a data source (Dowling, 2007). To consider subjective experiences, the researcher assumes a certain attitude of attentive openness and readiness for an in-depth understanding of the unique meaning of participants' lived experiences (Carpenter and Suto, 2008). Husserl uses the term "epoche" or bracketing to indicate the need to retain researchers' beliefs and their own external perspective regarding the topics under investigation (Matua and Van Der Wal, 2015; Phillips-Pula, Strunk, and Pickler, 2011). The use of bracketing allows a critical examination of the phenomena without influence by the researcher's own beliefs (Dowling, 2007; Gearing, 2004). Two bracketing conditions were therefore established in the current study on the basis of these recommendations: 1) performance of unstructured interviews without a predetermined question guide; and 2) provision of a description of the positioning of the research team (Gearing, 2004).

Research team

Prior to the study, the position of the researchers was established according to their previous experience and motivation (Carpenter and Suto, 2008). Table 1 shows the positioning of the research team.

Four researchers (two female and two male) were involved in the conduct of this study, one of whom (DPC) had experience in qualitative study design. Three researchers (CFP, LLF, DPC) had experience in research and were not involved in clinical activity at the time of the study, and NF is a Bobath-trained pediatric PT. NF had attended advanced pediatric courses (European Bobath Tutors Association (EBTA) accredited) and conferences with some of the participants prior to the investigation. An additional author (MM) is a Senior Bobath Tutor in Pediatrics, a member of the EBTA with research experience, and was involved in the writing of this article.

Context

In the European context, to be a pediatric Bobath therapist one must complete the Basic Bobath Foundation course for Treatment of Cerebral Palsy and Allied Neurological Conditions (240 hours). Further training is recommended and provided through various pediatric advanced courses (length varies from 35 to 80 hours). All courses are regulated by the EBTA (http://www.bobathtutors.com), which is an international association of pediatric tutors/instructors, founded in 1971 by a group of European countries. It now consists of over 200 tutors from 18 countries. The Spanish pediatric Bobath tutors are

Table 1. The positioning of the research team.

Theoretical framework	The theoretical framework was interpretivist. From this perspective, human actions are meaningful, and the goal of interpretive inquiry is the understanding of how people interpret the meaning of this social phenomena.
Prior experience	The main researcher (NF) is a Pediatric Bobath-trained therapist who has worked in Israel, the UK and in Spain over a time span of 25 years, and trained as a pediatric Bobath therapist in 2003, at the Bobath center, London. In the 13 years that followed, until the initiation of the research, she had completed 5 advanced courses taught by tutors from these three countries.
Motivation for the research	The differences perceived in the practice of Bobath therapists in different settings, and countries, as well as the varying emphasis on courses were the main motivation in carrying out this study. Awareness to the lack of a common definition, work frame or documentation and the claims by tutors that research regarding the BC was not reliable as we could not know what was actually done in the treatment, led to the choice of a qualitative study that would describe one variation of the phenomenon. The absence of publications in Spain or elsewhere on the application of Bobath concept by Spanish therapist and children with cerebral palsy from a qualitative perspective, considering that this may be of interest to healthcare professionals.

EBTA members, and the pediatric courses in Spain follow the agreed format and content.

Sampling strategies

Purposeful sampling based on the relevance to the research question and not clinical representativeness was employed (Teddlie and Yu, 2007). To this end, the researchers selected individuals who could provide essential insight regarding the phenomena of interest (Teddlie and Yu, 2007). In this study, the researchers included those who met the inclusion criteria. Sampling and data collection continued until redundant information from the data analysis was achieved, at which point no new information emerged from the data analysis (Carpenter and Suto, 2008).

Participants

The participants in this study were PTs who: 1) had completed the Pediatric Basic Bobath Foundation Course of 240 hours, and at least one advanced course of 35 hours. All courses were certified by the EBTA; 2) had 5 years of experience or more treating children with CP after having completed the Basic Bobath training; and 3) at the time of the interview were actively working and treating children with CP. Therapists from other professions were not included in the study in order to facilitate the finding of common themes to describe the phenomena. Exclusion criteria were PTs who: 1) had not completed the Bobath courses; and 2) did not work primarily or exclusively with children.

With the collaboration of the Spanish Association of Bobath-Trained Therapists, an invitation to participate was sent to all members with pediatric training. The recruitment procedure is shown in Figure 1. The study was approved by the Ethics committee of the Rey Juan Carlos University (code: 290220161616)

Data collection

Data were collected during April and May 2016 by NF. Based on the phenomenological design, first-person data collection tools (in-depth interviews) and the researcher's field notes were used simultaneously (Carpenter and Suto, 2008). Unstructured interviews were the main data collection tool. The interviews started with an open question: "*What is your experience of applying the BC when treating children with CP?*" Thereafter, the researcher listened carefully, noted the key words and topics identified in the participants' responses and used their answers to ask for further

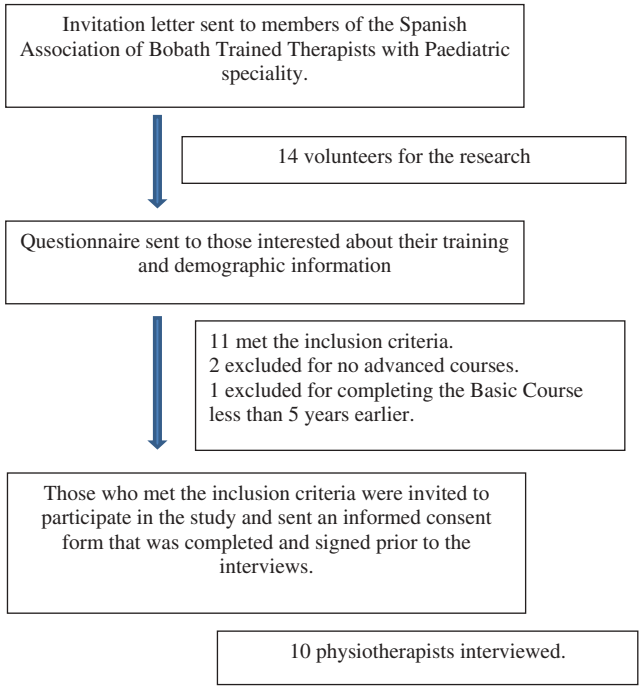

Figure 1. Recruitment procedure.

information and to clarify the content (Carpenter and Suto, 2008).

Ten interviews were audio-recorded and transcribed verbatim, recording a total of 753 min of interviews overall. The interviews ranged in length from 40 to 110 min (mean 75; SD 24.1). Additional contact time with the participants, excluding the interview, was in total 16 hours and varied from 30 minutes to 2 hours. Additionally, field notes were recorded for each of the 10 participants.

Analysis

Before the analysis, the process of handling and processing the data involved the following steps for each participant: 1) Conducting the interview accompanied by noting information in the researchers' field notes; 2) Immediately after the interview, the field notes were reviewed and expanded (Carpenter and Suto, 2008; Creswell and Poth, 2018); 3) The transcriptions were completed by NF, a member of the investigation team, who also performed the interviews. This was done 24–48 hours after the recording of the interview; and 4) After that, the full literal transcription of the interviews and the researchers' field notes were collated to perform a qualitative analysis. Data collection continued until the researcher achieved information redundancy, at which point no new information emerged from data analysis (in our study this occurred with participant 10) (Carpenter and Suto, 2008).

Thematic analysis was carried out by analyzing the most descriptive content and arriving at meaningful units. Further in-depth examination produced thematic code groups (i.e. meaningful units referring to the same issue or with similar content) until the main themes emerged (Carpenter and Suto, 2008; Sandelowski and Barroso, 2003). As a result of the analysis, the codebook was constructed featuring the narrations, the identified meaningful units, their groupings (i.e. thematic code groups), and the definition and characteristics of the groups of common significance obtained (Carpenter and Suto, 2008; O'Brien et al., 2014; Tong, Sainsbury, and Craig, 2007). Each interview was analyzed by two researchers (NF, DPC) after initially being analyzed independently without comparison between them. Subsequently, each researcher listed the emerging themes and negotiated congruent and contrasting issues. Various thematic code groups were formed and merged in the process until reaching the themes that best represented the data with the least repetition and overlap. In the event of differences of opinion, theme identification was decided by consensus. Finally, themes representing the core components or the essential aspects of the physiotherapists' experiences when applying the BC in the treatment of children with CP were identified. See Table 2 for themes, thematic code groups, and narratives from participants. No software was used to analyze the qualitative data.

Rigor

The guidelines established by the Consolidated Criteria for Reporting Qualitative Research and by the Standards for Reporting Qualitative Research (http://www.equator-network.org/) were followed (O'Brien et al., 2014; Tong, Sainsbury, and Craig, 2007). The data verification method consisted of triangulation by the researchers which involved: 1) presentation of the interview analysis to other team members in order to reach consensus; 2) audit of the material obtained from the participants by an external independent researcher; and 3) participant verification (Carpenter and Suto, 2008; Cohen and Crabtree, 2008). Participant verification was carried out in two steps: 1) Post-interview: The interview transcriptions were emailed to the participants to validate the contents and to allow for additional information to be added; and 2) At initial analysis of the interview: The units of meaning and the common significance groups identified by the researcher were emailed to the participants to confirm that they reflected the participants' perspectives (Carpenter and Suto, 2008; Creswell and Poth, 2018).

Results

Ten PTs (8 female) were interviewed. The demographic data and relevant information of the participants is presented as mean (SD): age of the participants: 40.9 years (9.9), work experience with CP: 19.7 years (8.5), period of experience using the BC with CP: 14.9 years (7.7), number of advanced pediatric Bobath courses: 3.0 (3.0, Range 1–10), and time elapsed since the last advanced Bobath course: 3.7 years (4.5).

When the qualitative data obtained from the participants were analyzed, five specific themes emerged regarding the essence of the BC. The following components were perceived by the participants as essential and very characteristic of how they applied the BC when treating patients with CP: 1) "normal movement" as a guide; 2) a "global" concept; 3) observation; 4) centrality of tone; and 5) working with families. Narratives of the participants regarding the five emerging themes taken directly from the interviews are reported in Table 2. Note that language such as "normal movement" is considered outdated, as is "abnormal"; "typical" and "atypical" are preferable. Similarly, "global" as a word is equivalent to the term "holistic" used by native English speakers. However, we considered it important to use the terms used by the therapists interviewed. In order to clarify which would be the most appropriate term to use, we will add the updated term within square brackets after the outdated term mentioned. Also, in the direct citations of the participants' interview, it will appear in non-italic format.

Theme 1: guided by "normal movement"

All participants identified "normal movement" (NM) [typical movement] as central in guiding their intervention and forming the basis for ongoing assessment and treatment. They considered that the child's movement should be approximated as much as possible to NM [typical movement], which was perceived unanimously to be central and unique to the BC.

> … insisting a lot on normal [typical] movement patterns for me is very Bobath, very basic (…)maximum autonomy in movement, with quality of movement patterns … I think it is very important, the quality of movement is totally Bobath. (P2)

For the participants, to be guided by NM [typical movement] means that the PTs promote movement patterns that are as close to normal as possible, thus enabling the child to learn how to move better. The most common components or expressions of NM detailed were rotation, dissociation, symmetry, midline,

Table 2. Themes, thematic code groups, and narratives from participants.

Theme	Thematic code groups with common significance	Narratives from participants.
Theme 1: Guided by Normal Movement	Normal Movement (NM) as central in guiding the intervention	*"The emphasis on normal movement is not found in other methods." (P10 65 y/o)* *"Normal movement for me is my guide, if you really know the movements, … that's going to give you a lot of information. With that I get an idea of what problems the child has and where to work … "(P7, 42 y/o)* *"They taught us that the issue of facilitation was fundamental, in children the facilitation of these movement patterns is very important, as normalized as possible." (P4, 47 y/o)*
	Characteristics of normal movement/ quality movement	*" … always with parameters of alignment and symmetry that is also what counts a lot in Bobath." (P8, 38 y/o)* *"Dissociate and rotate seem to me to be very Bobath words, concepts that are very present in the base of our treatment, because we know that is the future of quality movement." (P2, 42 y/o)*
	Principles of motor learning	*"If the movement is not carried out actively by the child and I am doing it passively, it doesn't make any sense" (P6, 28 y/o)* *"I encourage the child to learn to move, in an organized as possible manner, with patterns as normalized as possible" "by repeating the movements the child is learning, we are inciting the brain plasticity. The more you repeat, the more you learn, always with variability. "(P5, 35 y/o)*
	Minimizing abnormal/pathological movement patterns	*"Because we know that achieving the most optimal movement, closer to normality, … will allow the child, through repetition and active participation to benefit more from their movement." (P1, 45 y/o)* *"If I favor the child moving with abnormal patterns and repeating that movement, it will only lead to deformity" (P5, 35 y/o)*
	Accept suboptimal movements patterns in function	*"Very important the will of the child and the child being active, so that the treatment is effective … to have the feeling of movement even if it is not a very good pattern. Otherwise, they will not learn anything (P7, 42 y/o)*
	Normal sensory-motor development as a reference in the treatment	*"The BC is based on normal movement …, the development of the child, the spontaneous movements of the newborn, all this has already been taught to us by the Bobaths" (P9, 53 y/o)* *"I try to evolve … Follow the normal development of the child. … sometimes it´s possible, sometimes not. But it's not something sequential … one does not only consider where the child is, rather one sees the child, how can he better activate, or follow an activity. "(P5, 35 y/o)* *" … it's handling, while facilitating normal development, with the purpose of reaching that unilateral weight bearing with elongation with that lateral extension" (P3, 41 y/o)*
Theme 2: A Global Concept	Global character of the BC	*" … this more global aspect, to me personally, in the training I've done, I think in the BC is where it´s been most talked about." (P6, 28 y/o)* *"It´s important in Bobath to take into account not only motor aspects, but also, cognitive and sensory" (P8, 38 y/o)*
	What is influencing the spontaneous movement? Not only motor	*"Globality implies not seeing the movement in isolation, but also considering emotional, cognitive, sensory, communication, important aspects in a child, and aspects related to their ability to perform in their environment." (P1, 45 y/o)* *"I see the child as a whole, I see the child globally, I see everything: the relationship with the family, with the therapist, with the toys, with the environment"; (P5, 35 y/o)*
	Transformation into a significant activity	*" … there are many different possibilities, at a motor, sensory and language level, the whole approach has to be much more comprehensive. Not only to be a physio, not to only move arms and legs, especially not prescribe exercises, … but activities, and that these activities will be included and will affect the ADL. "(P9, 53 y/o)*
	Considering the child's contexts and environments	*"Whoever does Bobath only in the treatment room, loses a lot of their works' capacity and the continuation of their ideas throughout the day and to achieve benefit all day." (P8, 38 y/o)* *"The environment can be a facilitator for the functional objective we want to achieve. … everything that allows the child to develop that skill; the environment can be inside your home, at school, and we could also consider aids and support products. "(P1, 45 y/o)*
Theme 3: Observation	Observation as a key clinical tool	*"What has Bobath given me? How to observe what is failing, where the real problem is, how to establish priorities, SMART objectives, to plan activities. "(P3, 41 y/o)* *"I consider very important in BC learning to look (…) it is fundamental, observation, you have to see how they enter and you have to see many things." (P7, 42 y/o)*
	Observation improves with experience	*" … through experience, be more patient, to be able to see the abilities and what they need in order to be more skilled in the day to day." "Now I see things earlier. I'm more specific. It's the base of the BC."(P8, 38 y/o)* *" … It's acquired over the years, and to feel, the fundamental thing is the sensation of movement, … when a patient comes to me the first thing I do is to see how he moves, if he takes off his clothes, or not, how he does it … . it's a movement analysis. "(P7, 42 y/o)*
	Constantly treating and evaluating	*"Observation is very important. Hence, it is always said that what we do in Bobath is an evaluation in a continuum of analysis and treatment of the child. "(P8, 38 y/o)*
	Observe change in the session – No standardized observations	*"I always want to see change in the session. Otherwise, it was not at all useful "(P7, 42 y/o)* *"The handling changes according to the activity that I see in the child … I see if it is maintained, I see if I change something, … that's how I see if it is working … " (P5, 35 y/o)*
Theme 4: The centrality of Tone	Focus of treatment on tone	*"The issue of normalizing tone, the issue of constantly assessing whether the activity correctly modulates the muscle tone in the child … seems to me a very Bobath concept, and very basic." (P2, 42 y/o)*

(*Continued*)

Table 2. (Continued).

Theme	Thematic code groups with common significance	Narratives from participants.
	Assessing expressions of each child's tone/patterns of movement	*"In the tone I take note of the type and distribution, if there are involuntary movements, fluctuations, if there is an ability to control or regulate that tone or if on the contrary, motor control is very poor and [the child] is not capable of functioning without spasms or dystonia."(P6, 28 y/o)*
		"With movement I can get information about the child's postural tone, and what pattern of movement they have, …. I mainly look at the base postural tone because movement often deceives you, associated movements appear, or associated reactions that mislead you when it comes to assessing the child's tone "(P7, 42 y/o)
	Modifying tone	*"To reduce tone- you decrease the effect of gravity and you use slow movements, rotation, movements with dissociation, elongation of the hypertonic muscles; the tone normalizes" (P2, 42 y/o)*
		"One of the techniques I use is handling the child while facilitating movement, I also use other techniques to somehow modulate the tone … to increase the tone, or to bring it closer to a more optimal tone." (P1, 45 y/o)
	Preparing tone	*" … maybe, at the beginning of the session it is about adjusting the tone a bit more and then in the second part of the session I try for it to be more active … " (P7, 42 y/o)*
		" … maybe I believe that the tone is adequate in order to carry out a more active, more functional activity and then I see that the pattern of posture is exactly the same again, and I have to do another preparation of the tone, before going to the activity." (P4, 47 y/o)
	Inhibiting tone	*"There is a first part that is more passive on the part of the child, more active on the part of the therapist, more inhibition, more management, more horizontal and from there, already working more against gravity and with more motor recruitment … " (P2, 42 y/o)*
		"The inhibition of tone, the righting reactions, the support reactions, … are tools in the session, but they are often [also]a goal to achieve." (P2, 42 y/o)
	Activity and function with normalized tone.	*"At the moment that the tone is normalized I start with the activity. This is how we almost assure ourselves that the activity will be much better, that he will enjoy it more, because he will be able to do things that he would not otherwise have been able to do "(P9, 53 y/o)*
		"We can work a little on the task or we could prepare in the function or make a specific preparation for the child to improve their function in the task. These would be two ways of approaching."(P1, 45 y/o)
Theme 5: Working with Families	Emphasis in the BC on family as essential for the success	*"We can understand this child, the characteristics of his potential, think about his future, we can transmit this to the parents and they can take it forwards. For me this [parent involvement] is the first thing in the BC."(P9, 53 y/o)*
		"Parents have to be present to see what happens or does not happen … It is what also differentiates [the BC] from other types of treatments." (P8, 38 y/o)
	Obligation toward the parents	*"First you have to know the child and the family. See their possibilities and see what to do: … they give you a lot of information, I give them tools."(P5, 35 y/o)*
		For me it is more a learning of the family, a thing that is going to be very durable, because children have something chronic."(P5, 35 y/o)
	Parents should be present	*" … the parents get absorbed in the work, in our concept … It is important to be with them as a team side by side. The parents in the session."(P4, 47 y/o)*
		"Parents too, see why and for what we are playing. Then we finalize the session, reminding what we have done, what we have achieved and that this can be done at home, incorporated in other situations at home … They keep the essence of what we have done so they can apply it at home. "(P9, 53 y/o)
	Parent involvement in decision making	*"The role of the family, first, is to understand what is the problem that your child presents, what is a brain injury and what is involved. I think it's very important that you share what are the goals that parents want to achieve with this child and that they become collaborators, not therapists but collaborators, to maintain the child or provide adequate handling … "(P1, 45 y/o)*
		"Also the expectations that the parents have, I do not have to work toward them, but I should take them into account, So I can get as close as possible." (P9, 53 y/o)
	Postural equipment	*"I give a lot of importance to the topic of postural hygiene, I go to the school, to the house, I advise in all environments … They can be with me one hour, one to three times a week, … but at home and in the school they spends many hours, that's why I give it a lot of importance. "(P7, 42 y/o)*

weight shift and weight bearing with elongation and activating [inactive] muscles. To achieve this, they reported that they applied principles of motor learning, such as repetition with variation, engaging in activities that are meaningful to the child and of increasing difficulty and complexity.

With reference to NM [typical movement], "movement patterns" were considered desirable or undesirable, and also referred to as "abnormal" or "pathological". The participants considered that compensations and associated reactions are undesirable and an obstacle to function.

> I try to give symmetry, reduce compensations, a normalized posture, trying to avoid the presence of the postures that we do not like, that is, pathological patterns (P4)

They aimed to use movements that allowed the performance of functional activities and to achieve their integration into the child's spontaneous activity. A few participants' narratives added that sometimes undesired movements need to be used by the child in order to achieve a desired function.

> Many times we don't manage to change this negative part of a movement or movement pattern; nevertheless, we need to include that movement in an activity … because it's going to be useful for this child. (P4)

These participants suggest that "normality" [typicality] is not an actual goal, but rather a guide as to how the quality of movement and its functionality might be improved.

Five of the 10 participants mentioned that they used applied knowledge of normal [typical] sensorimotor development as a reference in treatment, although the order was not strictly followed.

Theme 2: a "global" concept

This theme refers to the PTs' consideration of all aspects that interfere with and affect the acquisition of motor skills and their transformation into a meaningful activity. All participants used the word "global" (in Spanish) to describe the holistic character of the BC.

> I have no doubt, there has not been another method that is as complete and as global [holistic] as the BC. (P7)

They emphasized taking into account not only the motor impairment, but also the functional capacity of the child in activities of daily living (ADL), personal circumstances, environmental factors, and the child's personality, preferences and interests as well as those of the family. The participants considered the "global" [holistic] character of the BC to be representative and unique.

> If you forget how the child's way to school is going, that the mother needs a tool so that she can feed her, that she cannot be there 24 hours a day with an adult who corrects her and does the manual handling she needs, it would not be Bobath.(P2)

All participants discussed how movement is the end result of the interaction of many factors. The most repeatedly mentioned were motor function, sensory components, cognition, emotion, motivation, communication, and family and child preferences. They described how they tried to identify what was influencing performance during spontaneous activity.

Another expression of the "global" [holistic] nature was the reported practice and perceived necessity to intervene in all of the child's contexts and environments (school, home and family) in order to achieve the goals.

Theme 3: observation

The great majority of participants identified observation as a key clinical tool for the assessment and ongoing evaluation of the treatment, and as a foundation for their clinical reasoning process and treatment choices within

> The BC is very marked by … basically our observation … (P4)

Observation is described as a continuous process that allows the identification of the characteristics of the child's movement, activity and participation in daily life. Observation of movement patterns in a variety of positions and activities allows them to understand better how they may be able to influence them and achieve optimal activity. They described looking at "what the child does, how he/she does it and why", serving as a basis for analyzing and interpreting their activity. They also referred to the idea of "constantly treating and evaluating".

> … evaluation and treatment go together hand in hand … not only observing the difficulties they present, but also try to interpret, analyze and explain why. (P1)

A few participants elaborated that observation is a skill that improves with experience and by joint learning with other Bobath-trained colleagues. They related their observation skills directly to their learning in the context of the BC.

While the child's response to intervention is continuously assessed, so is the intervention choice; "if it doesn't work I need to change something". However, no standardized or formal method to document the observations was mentioned. Some general references were made to the use of assessment tools such as Gross Motor Function Measure, Modified Ashworth Scale, Haizea Llevant Development Chart, and the use of video recordings.

Theme 4: the centrality of tone

Postural and muscular tone were also identified as central to the assessment and treatment of the children. Most participants considered tone to be the main cause of movement alteration in CP, and therefore the cause of less than optimal functioning in daily life.

> Bobath places more emphasis on this aspect; the child's global [predominant] patterns and the influence we can have on the child's postural tone.(P6)

The aim of treatment was therefore identified as modification of tone, which in turn is also a tool to improve the child's activity and function. Other coexisting contributors identified were weakness, sensory deficits, coordination, perception, postural control, and planning and organization of movement.

All participants described how altered tone produces "abnormal" [atypical] movement patterns, and they understood that these need to be modified where possible and brought closer to the "normal" [typical]. While working with the child, the expressions of each child's tonal characteristics are identified. For example, the participants mentioned quality, distribution, severity, specific movement patterns (e.g. excessive pronation, internal rotation, or flexion) and how the tone is affected by varying position, activity level and passive and active movement.

> The priority and the first point of attention, there's a constant assessment, assessing and treating the tone, the tone conditions me. The postural tone will condition the posture, and also the movement. These three elements I cannot put aside at any time. At the same time they are very interrelated. (P4)

Further, when assessing "what influences tone" during the treatment process, the PTs referred to the interaction with gravity, the level of task difficulty and effort required, as well as the velocity of the activity. They described their treatment as directed toward "changing tone", "modifying tone", "modulating tone", "normalizing tone" or "influencing tone". This treatment is to allow the child to learn how to better control his/her movements and posture against gravity.

To modify tone, participants also considered modifying the environment, the voice used by the therapist, the emotions of the child and the interaction between child and family. The majority described specific activities aimed at increasing or decreasing tone, stating that it is a progressive process implying trial and error and constant reevaluation.

Three participants (2, 4, and 8) referred at some point to "inhibiting tone", although they themselves used other terms as well and commented spontaneously that the term is no longer in use. The majority described "preparing tone" or just "preparation" prior to the "more functional" or "more active" part of the treatment, or as being done while the child is actively engaged in a functional task. They elaborated that tone is modified/prepared by elongation, stretching and activating, and modifying supports, positions, handling and the task.

Theme 5: working with families

The participants considered the family as essential for the success of their intervention, stating that without the family it is difficult to transfer the benefits of therapy to 24 hours of the day and to achieve their goals as Bobath therapists.

> It is fundamental because really the parents are constant in the child's life and we are not. The training of parents is fundamental and it is emphasized in the BC.(P6)

The main role of the families was perceived as: a) to transfer what has been learned in therapy sessions to the daily life of the child, and b) postural care to minimize musculoskeletal complications.

The PTs expressed an obligation toward the parents, which consists primarily of teaching them and helping them to understand and respond to their child's needs, and to promote their development and independence. They teach the parents handling, positioning, the use of equipment and the transfer of activities from treatment to daily activities:

> … the Bobath concept has to be 24 h: to teach the family handling … It seems very important to me that the children have a good chair and a good position … to maintain what was worked on in the sessions and what the parents continue doing at home. (P5)

They all agreed that when possible parents should be present in the assessment and treatment sessions, where they are guided in ways of handling during ADL and play. Some described it as being absorbed in the session, insisting that parents are not therapists and should not "treat" the child, in contrast to some other therapies, such as Vojta.

> Parents have to be present to see what happens or doesn't happen … It is what also differentiates [the BC] from other types of treatments. (P8)

On the other hand, they appreciated that they depend on the parents to provide valuable information about their child, the environment, and the changes they perceive in their child, thus contributing to the evaluation and improvement of the treatment. The majority of the participants insisted that it is necessary for the parents to be involved in decision-making, describing a process of negotiation, assigning the parents an active role. However, a minority (participants 6, 7 and 10) assign them a more passive role in goal setting.

All the participants recommended the use of postural equipment such as standing frames and supportive seating at home, while half also prescribe stretching as a usual or occasional practice.

Discussion

Our results describe perspectives of a group of PTs toward the application of the BC in the treatment of children with CP and reflect what they considered as core elements of the BC. The themes describing the essence of the BC were "normal [typical] movement" as a guide, centrality of tone, observation, a "global" [holistic] concept, and working with families.

The variety in the populations previously studied, the research methods, and large timespan limit the significance of the comparison of our results with previous reports. Direct comparison will be restricted to studies that reported Bobath-trained therapists' perspectives, views or treatment content in pediatrics (DeGangi and Royeen, 1994; Dirks, Blauw-Hospers, Hulshof, and Hadders-Algra, 2011). Although this literature is outdated, we find that the themes have much in common. Similar to our study, "quality of movement" and "tone", "knowledge of normal [typical] movement" and "observation" had been identified as core aspects of NDT (DeGangi and Royeen, 1994). Also reported as key were "functional performance", "upper and lower extremity function", "integration of treatment into daily activities" and "ongoing process of problem solving". The concepts cited appeared within the themes in our results.

In contrast to our results, "reflexes and posture", was also a key aspect for the NDTA therapists (DeGangi and Royeen, 1994). The absence of reference to reflexes in our results demonstrates a shift away from their previously perceived role in posture and movement by Bobath/NDT therapists. Additionally, being an individualized and holistic approach and "working with families" were not considered key aspects of the BC by the majority of the NDTA therapists (DeGangi and Royeen, 1994). While this change of emphasis could reflect a general belief among therapists today, the participants in our study specifically identified them as essential to and characteristic of the BC. This does not mean they believe these components to be exclusive, but rather integral to the concept. From our results we cannot say why they were perceived as unique to the BC and whether their application differs from that of other therapists (in Spain) who are not Bobath-trained. Working with families and observation are undoubtedly generic skills in physical therapy; however, for the PTs they were directly connected to their application of the BC and considered skills they had acquired through Bobath courses.

Observation and family participation may be widely used concepts, but in practice they can be explored and applied in distinct forms. According to Dirks, Blauw-Hospers, Hulshof, and Hadders-Algra (2011), when comparing NDT to a family-centered early intervention program, the NDT therapists' approach toward the family is of "explaining and guiding", rather than "coaching". They also reported that Bobath therapists usually undressed the children during treatment. This could reflect their intention to observe movement strategies of the child more closely. The NDT therapists' treatment was guided by normal [typical] development, with more time spent on facilitation and handling, to address tone and to promote typical movement patterns.

A treatment model relevant to all ages that reflects the practice of IBITA instructors and their understanding of the BC has been published by Michielsen et al. (2017), followed by a demonstration of its application in the neurorehabilitation of adults. A close inspection of this model reveals that although the language used is very different from our results, the essence has much in common. What the Spanish PTs referred to when describing how they used "normal [typical] movement" as a guide and "observation" is described in the model by Michielsen et al. (2017) as "functional movement analysis". In that model, observational analysis serves to identify atypical motor behavior and compensatory strategies. Consideration of quality and efficiency persists, as the model refers repeatedly to optimizing rather than maximizing function. Tone is not mentioned in the model; however, skilled facilitation is. In our results, modifying tone was the main objective of facilitation. All aspects of facilitation in the model were also identified by the participants as ways to influence tone. The variation in emphasis could be related to the population treated (adults vs. children with CP), while the insistence of our participants in addressing tone as the main obstacle toward improved motor function and participation would seem to reflect a more traditional Bobath approach. The researchers believed that the holistic/global nature of the BC is also clearly present in the IBITA model in its intention to "create a movement experience" in "meaningful tasks" and other considerations in the individually tailored treatment.

Previous publications (Barber, 2008; Mayston, 2001a, 2008a; Veličković and Perat, 2005) reflecting the views of Bobath tutors on the application of the BC in pediatrics in the treatment of CP identified key topics as: addressing muscular and postural tone; aiming to improve the quality of movement to result in improved function; the importance of working with

families; and being a holistic approach. Interestingly, our five thematic findings are reflected in a model proposed by Mayston (2008a, 2008b)) of core Bobath elements central to the child-centered treatment approach. Again, the term "normal [typical] movement" is not included in the model, but the role attributed to it (by the participants) as a guide is reflected in the ideas of observation, analysis and "handling to change tone/activity", and various aspects of motor learning.

Our results demonstrated outdated language that may reflect an outdated approach. Reflex and tone inhibition, a central component of the treatment as described by Karl and Bertha Bobath (Bobath, 1966; Bobath and Bobath, 1956), is no longer considered relevant in the teaching of the BC (Mayston, 2001a, 2001b, 2008a). In our study, the participants made no reference to reflexes, but tone inhibition was still identified by a minority as part of tone modification. It is evident from all publications mentioned previously that the terms "normal [typical] movement", "normal movement patterns" and "normal tone" were in the past central to the teachings of the BC and in the way PTs understood the difficulties they addressed in their treatment. In recent years, a shift has been evident in studies and other publications regarding the perspectives of Bobath tutors (Mayston, 2008a, 2008b; Michielsen et al., 2017; Vaughan-Graham and Cott, 2016; Vaughan-Graham et al., 2019; Vaughan-Graham, Patterson, Zabjek, and Cott, 2017). Tone alteration is no longer identified as always the main cause for the movement disorder, and there has been a shift from describing movement as normal/abnormal to typical/atypical. This reflects the current understanding that a wide variety of movement strategies exist in adults and children who do not have neurological conditions. Additionally, referring to movement or tone as "abnormal" is considered offensive and not useful; indeed, it has been proposed that the border between typical and atypical movement is unclear (Latash and Anson, 1996). Our participants referred to "normalizing tone" and also "optimizing tone"; while all used the term "normal movement", some also used "typical movement". Clearly changing the tone and "normalizing" movement were identified as goals in themselves to be integrated progressively into activity in therapy, function, daily activities, and eventually into participation. This could possibly mean that they focused more on improving quality of movement within the activities that the child performs rather than expanding their skills and participation with lesser quality.

In the more recent literature (Mayston, 2008a, 2008b; Michielsen et al., 2017; Vaughan-Graham and Cott, 2016; Vaughan-Graham et al., 2019; Vaughan-Graham, Patterson, Zabjek, and Cott, 2017), when considering quality of movement, references are made to "efficiency" "selectivity" "alignment" and coordinated sequences, among others, rather than approximating it to "normal movement" as described by our participants.

Finally, does the use of outdated language imply that the treatment is also outdated? Possibly; a more refined language implies a more refined treatment, but this cannot be assumed. There could be language or cultural contributors, considering the group of participants. For example, language barriers may reduce exposure to newer literature and language. When trying to understand how the BC is experienced by those who practice it, it is significant to consider what terms have changed or evolved, and which concepts have been dropped altogether, such as tone/reflex inhibition.

The contribution of our findings is that they describe how the BC is experienced by a specific group of therapists, and what has become central in their practice. The results could also reflect other local influences such as education and training and service models, but this is difficult to assess. The themes we presented include components that are not unique to the BC, such as working with families and observation. Further investigation would be necessary to better differentiate these aspects from the general practice of PTs not exposed to the BC.

This study has limitations concerning generalizability. Qualitative research is used to show an individual's experience, but it is not generalizable; it is not a goal of this type of research. Only Spanish PTs were studied; therefore, it cannot be regarded as reflecting all pediatric PTs who apply the BC. The BC is also a transdisciplinary approach, so it would be important to study the views of other disciplines as well. Secondly, previous knowledge of some of the participants by the first author could result in mutual influences on their perspective on the studied phenomena. To avoid this, the design of descriptive phenomenological studies includes the process of bracketing. Finally, two of the authors are Bobath therapists, which might also influence the results and interpretations. In order to control and clarify this potential influence in phenomenological studies, the positioning of the authors is declared, as can be observed in Table 1.

Clearly, there is a lack of research and publications regarding the nature of treatment based on the BC for children with CP. It is to be hoped that our results can contribute to further research on the subject.

Conclusions

This study provided insights into how the BC is understood and experienced by a group of Spanish physiotherapists treating children with CP. Our findings described what was perceived to be essential components of the BC as applied by that group of Bobath-trained PTs, and may have important implications for understanding and defining the BC as it is practiced. The study participants used outdated terminology at times when discussing tone and movement. However, they reported that they no longer adhere to the theoretical perspective of pathological reflexes and reflex/tone inhibition. Our study may also provide a basis for further research into the application of the BC for children with CP, and could serve as a basis for comparison with other treatment approaches applied in the treatment of CP.

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Declaration of Interest

The authors declare that Naama Farjoun is a member of the Spanish Association of Bobath-trained Therapists. Margaret Mayston is a Senior Bobath Tutor and member of the British Association of Bobath-trained Therapists. The other authors declare no conflict of interest.

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