



Scientific Endorsements and Expert Insights
for Nana 'Ruby Blooms'



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Ruby Blooms

The *Ruby Blooms* is a sensory book that creatively, engagingly, affectionately, respectfully, and technically addresses menstrual education for autistic girls experiencing their first period—an event that marks their entry into adolescence.

As a therapeutic and learning tool, it enhances sensory aspects in a more enriching way than traditional approaches, emphasizing visual, tactile, auditory, olfactory, and sensory-motor experiences through printed narratives, illustrations, varied sensory resources, and multiple interaction possibilities.

The perspective adopted here views the sensory book as an object that can be freely and simultaneously guided in its manipulation by the child, maintaining its playful nature while fostering a close relationship between the author and the mediator of the created object (Ramos, 2017; Letria, 2020; Regatão et al., 2021, cited by Donega et al., 2024). This way, interaction is continuously enriched by the every new encounter between the author's creation and the child's use of it. This approach aligns with Maria Montessori's (1987; 2010) propositions, which focused on the "education of the senses" through the creation of sensory-based learning materials. Sensory books, therefore, offer children the opportunity to engage with stimuli in various ways, creating a unique narrative (Donega et al., 2024).

Adolescence is a highly challenging period but also a unique opportunity for development, learning, and self-discovery. With proper support, understanding, and affection, each adolescent can enter this phase with greater confidence, improved quality of life, and meaningful experiences. This is one of the key purposes of *Ruby Blooms*.

Pages 01 and 02, 19, and 20

These pages aim to introduce the girl not only to menstruation and ovulation but also to discussions about the body, its boundaries, and the location of the main organs involved when she reaches puberty and experiences her first period.

Considering that almost all girls developing with ASD and sensory processing dysfunctions face unique challenges, a playful and affectionate approach in a safe environment was designed to help them learn. Through tactile stimuli, they are also introduced to interoception and the perception of pain and other sensations inherent to the menstrual cycle.



The literature is somewhat more extensive when discussing pain perception in autism, highlighting important insights for both professionals involved in this care and families. Research suggests that pain perception in autistic individuals can be more intense than the triggering stimulus, particularly during the menstrual period, due to hormonal changes. This sensation may cause much greater discomfort for autistic girls compared to those with typical development.

Interoception is the ability to perceive and interpret bodily sensations such as hunger, pain, thirst, heat, and sleep, among others. The interoceptive system allows the brain to monitor and regulate internal bodily functions, maintaining homeostasis—the body's internal balance.

Interoception allows us to "feel" our internal organs and skin, providing information about the internal state or condition of our body (Craig, 2002, as cited in Mahler, 2016). Specifically, interoception is a key component of our emotional experience. In other words, interoception, or awareness of our internal bodily states, forms the basis of how we perceive or feel emotions (Barrett, Quigley, Bliss-Moreau, & Aronson, 2004; Craig, 2002, 2003, 2009; Critchley, Wiens, Rothstein, Öhman, & Dolan, 2004; Pollatos, Gramann, & Schandry, 2007; Pollatos, Kirsch, & Schandry, 2005; Wiens, 2005, as cited in Mahler, 2016).

This connection between clear perception of bodily signals and accurate identification of emotions is crucial because, without bodily signals, it becomes difficult to clearly detect which emotion is occurring at the moment. Interoception is a vital component of emotional experience (Mahler, 2016).

This system can also be involved in the various sensory processing dysfunctions that autistic individuals experience, impacting their daily lives. Some researchers suggest that individuals with autism have much lower levels of interoceptive awareness compared to neurotypical people. As a result, they may experience bodily signals either too intensely or struggle to accurately perceive their body's internal cues. They may have difficulty distinguishing between bodily and emotional signals, may not be able to recognize when they are in pain or fatigued, and may find it challenging to interpret emotions.

The impacts on daily life can include difficulties in connecting with others and understanding their needs, struggles in relationships, trouble sleeping, challenges in managing uncomfortable sensations, and difficulties in identifying and regulating their own emotions.



In these pages, the girl will experience body awareness through tactile stimulation, perceiving how blood moves until it reaches the outside. Similarly, when discussing ovulation, she will have the opportunity to learn about the release of the egg from the ovarian follicle during the menstrual cycle.

It is through sensations that we perceive the environment around us. They allow us to form ideas, images, and understand the world. One of the ways children interact with knowledge is through touch. With their hands, they feel the texture, shape, and size of objects. Montessori (1870–1952) stated that all knowledge begins with the hands and that, by using the sense of touch, children interpret the world they are immersed in: *"The child loves to touch objects so that they can later recognize them"* (Ferrari, 2008, as cited in Pettenon et al., 2017).

The five senses (hearing, touch, taste, smell, and sight) serve as gateways to knowledge, and when they are stimulated, the learning process can be facilitated, creating opportunities for new teaching resources. The body itself becomes a fundamental tool for a child's acquisition of knowledge (Goldschmidt, Machado, Staevie, Machado, Flores, 2008, as cited in Pettenon et al., 2017).

As discussed in Serrano (2016), the tactile system is located in the skin and serves as the boundary between the body and the surrounding world. This system controls reactions to everything that touches the body or that the body touches. People need touch to maintain their well-being. The tactile system helps form concepts about objects, influencing learning. It plays a crucial role in self-regulation and is closely connected to the emotional system, as every touch sensation carries an emotional meaning.

On page 02, Ruby Blooms provides this experience when the girl lifts a flap in the abdominal region and discovers the organs of the female reproductive system—the ovaries, fallopian tubes, and uterus. She also learns about their positions in the abdomen and their connection to the vagina. For the menstrual experience, this interactive approach was designed to create a meaningful and sensory-rich learning experience.

This experience would be more effective with a sensory resource that has a consistency and color as close as possible to menstrual blood. This would be contained in a transparent plastic "pouch" shaped like a uterus and vagina, which would be placed over the illustrated uterus and vagina.

The child would have the opportunity to gently press the pouch with their fingers, pushing the "menstrual blood" from inside the uterus until it reaches the outside of the body.



Pages 19 and 20 introduce the girl to the organs of the female reproductive system and their function during ovulation.

Page 19 features an illustration showing the eggs produced inside the ovary, with only one maturing due to hormonal action and then breaking through the follicle. This egg is captured by the fallopian tube and travels until it reaches the uterus. The stimulation on this page is primarily visual. However, understanding ovulation also depends on other cognitive skills.

Page 20 presents the organs with textured surfaces: a soft, velvety touch for the egg, a slightly rougher texture for the fringes of the fallopian tube, and a light consistency overall. The egg's raised surface will include a small opening, which will only become visible when the child applies gentle pressure to reveal and feel the egg (a small oval-shaped ball) emerging from the ovary. To experience ovulation, the child will press lightly on the egg with their finger, simulating the follicle rupture and the egg's capture by the fringes of the fallopian tube. By maintaining this pressure, they can follow the egg's journey all the way to the uterus.

Pages 23 and 24, 25 and 26

Pages 23, 24, 25, and 26 also respectfully and sensitively address the interoceptive system and its typical signals during the menstrual cycle, as well as its impacts on daily life.

Pages 23 and 24 highlight symptoms such as intense fatigue and loss of energy, which may be felt in the legs and pelvic region, making daily activities more challenging. Menstrual fatigue can be uncomfortable. Once again, tactile sensations are incorporated to help the girl identify the main parts of the body involved and to support learning about sensations and emotions.

Page 24 features an illustration of the book's main character, a girl with typically Arab features, displaying a facial and physical expression (with her hands on her abdomen) that suggests physical discomfort, pain, and abdominal distress.

To highlight this phase of the cycle, which often presents with abdominal bloating, the abdomen was designed to have a slight raised texture, a soft touch, and a light consistency,



allowing the child to perceive the bloating through touch. This also helps in recognizing facial and physical expressions related to discomfort.

Pages 25 and 26 focus specifically on facial expressions during this phase of the cycle (and in daily life). Developing sensitivity to these expressions requires more than just processing interoceptive sensations—it also involves integrating tactile, proprioceptive, vestibular, visual, and auditory sensations. Throughout development, as the child engages in various social interactions, they learn to identify the boundaries of their own body (tactile sensation), interpret sounds they hear (auditory sensation, which also depends on body movement in space), and recognize how their body moves in different ways (vestibular and proprioceptive sensations), including facial movements and how they perceive them visually. When all these systems function in harmony, language becomes a way to navigate the world of relationships. In this way, the child learns to recognize facial expressions, understand their meaning within a given context, and determine appropriate responses.

Autistic individuals often struggle to manage their emotions, express affection, and recognize the emotions or feelings of others. In many cases, they also find it difficult to maintain eye contact (Camargos, 2002, as cited in Boff et al., 2019).

To address this need, pages 25 and 26 of *Ruby Blooms* introduce a specific form of interaction, emphasizing an activity designed to facilitate the identification of sensations and their association with the experience of the menstrual cycle. This approach helps improve communication skills and the understanding of the relationship between situations and emotions.

The literature highlights proposals similar to *Ruby Blooms* with this goal, such as the free app *Touch and Learn – Emotion* (Apps, 2019). Although this app was not specifically developed for autistic individuals, it can be used to support emotional comprehension. Many autistic individuals face challenges in understanding and expressing emotions, according to Assumpção Jr. et al. (1999, cited by Boff et al., 2019). The authors state that “*there is a difficulty in perceiving facial expressions in autistic children, which directly affects social relationships (...). Thus, the absence of this specific cognitive characteristic would make it harder to understand both their own mental states and those of others.*”

Autistic children can recognize individual elements of a facial expression but may struggle to combine them into a specific emotional meaning. The app focuses on helping children



interpret body language and understand emotions through facial expressions. This learning process occurs through photos of children displaying different emotions (Boff et al., 2019).

Considering the various sensory processing dysfunctions in autism, regardless of support levels, sensory information processing is altered. Additionally, a more "childlike" behavior is often observed in autistic adolescents, precisely because their ability to interpret body and facial expressions is limited. This affects social interactions and decision-making, which is why many, even those at support level 1, experience bullying.

These pages help the girl identify these sensations, aiming to support her in organizing a daily routine—not only for intimate care and necessary hygiene products but also for meaningful activities and sensations, especially those that reduce sensory overload and prevent crises.

On page 26, there are illustrations of the girl's face—the book's main character—showing different emotions. They are placed on a magnetic board. Alongside each illustration, the girl's hair is provided separately. The learning activity on this page involves the child interpreting the facial expressions and placing the appropriate hairstyle over the face, matching the expression to the corresponding emotion or sensation.

Pages 17 and 18, 27 and 28, 13 and 14

Pages 17 and 18 discuss the selection and organization of products to be used during the different phases of the menstrual cycle. Similarly, pages 27 and 28 address daily activities that promote sensory ease, helping with self-regulation, organization, and behavioral stability.

Individuals with Sensory Processing Disorder (SPD) struggle to register, modulate, and organize sensory information to execute successful adaptive responses to situational demands (Humphry, 2002, as cited in Ricon et al., 2017). Sensory Processing Disorder is expressed as either hyper- or hyposensitivity to typically non-aversive stimuli (Miller, Coll, & Schoen, 2007, as cited in Ricon et al., 2017). Individuals with hypersensitivity perceive stimuli as uncomfortable and, consequently, adopt various coping strategies and exhibit extreme emotional responses. Sensory hypersensitivity is associated with anxiety (Engel-Yeger & Dunn, 2011, as cited in Ricon et al., 2017), irritability, and high levels of arousal (Kinnealey & Fuiiek, 1999; Pfeiffer, Kinnealey, Reed, & Herzberg, 2005, as cited in Ricon et al., 2017). On the other hand, sensory hyposensitivity is linked to low levels of arousal. Both hypo- and hypersensitivity can limit a child's ability to adjust to



environmental situations (Pfeiffer et al., 2005, as cited in Ricon et al., 2017) and their participation and performance in various daily activities, such as personal daily living activities (PDL) and instrumental daily living activities (IDL) (Engel-Yeger, 2008; White, Mulligan, Merrill, & Wright, 2007; Yakir-Katz, 2009). Sensory Processing Disorder can lead to a sense of personal inefficacy, lack of control, or dissatisfaction with performance (Mulligan, 1996, as cited in Ricon et al., 2017).

For these skills to develop, sensory processing across various sensations must be in harmony. Research indicates that, for autistic individuals—even those at support level 1—managing the sensory experiences of menstruation can be particularly challenging, as they already face difficulties with everyday sensations. Interoceptive, proprioceptive, tactile, and auditory abilities, among others, work together and play a crucial role in making appropriate choices regarding products and activities for this period—and for life in general.

For example, choosing the most suitable pad for one's menstrual flow requires an awareness of the volume and sensation of blood flowing until it reaches the outside of the body (interoceptive, tactile, and proprioceptive processing). Similarly, remembering to carry extra underwear in the backpack also depends on these sensory abilities.

The decision to use wet wipes depends on one's neurological threshold for tactile sensations, including temperature, as well as the selection of hand hygiene products.

In this context, page 18 features the girl with a thoughtful expression, with "cloud-shaped" thoughts emerging from her head, symbolizing her process of organizing her environment. Inside the thought cloud, a checklist of products—pads, extra underwear, wet wipes, and hand soap—is illustrated without added sensory elements, making them visually clear and accessible to the child.

Children with ASD may exhibit behavioral responses that reflect a low sensory threshold for certain stimuli while simultaneously displaying responses that indicate a high threshold for others (Miller, Reisman, McIntosh, & Simon, 2001; Shelly & Bundy, 2012, as cited in Ricon et al., 2017), highlighting the complex nature of the disorder (Miller, 2006, as cited in Ricon et al., 2017). Some research explores how the sensory profiles of children with Sensory Processing Disorder impact their participation in daily life routines (Ricon et al., 2017).

Daily living routines are often affected by children's responses to sensory input. Dressing, eating, and hygiene habits are frequently influenced by sensory preferences or sensory



avoidance behaviors. Many hypersensitive children develop rigid habits around personal hygiene. For example, they may only accept specific clothing textures, refuse to have their hair or nails cut, or be extremely selective about the texture and taste of food. Sometimes, this behavioral rigidity impacts the entire family, affecting decisions such as where to eat out or spend the weekend (Serrano, 2016).

Children with ASD feel more comfortable when provided with the stability of predictable daily routines (Larson, 2006, as cited in Ricon et al., 2017). However, studies have shown that families of children with autism, in their efforts to meet their child's need for rigid activity patterns, also experience significant restrictions in their own daily routines (De Grace, 2004; Dunst, Trivette, Humphries, Raab, & Roper, 2001, as cited in Ricon et al., 2017). Even small variations in the family environment can cause confusion, pressure, and anxiety (Grodén, Cantela, Prince, & Berryman, 1994, as cited in Ricon et al., 2017), disrupting the family's ability to maintain a healthy and balanced daily routine. Research has indicated that routines, composed of predictable and repetitive activities such as dressing, eating, sleeping, and playing, provide fertile ground for learning opportunities (Spagnola & Fiese, 2007; Ricon et al., 2017) and can serve as effective intervention contexts to support better child development (Dunn, Cox, Foster, Mische-Lawson, & Tanquary, 2012, as cited in Ricon et al., 2017).

Therefore, interventions that help structure and adapt family routines to the needs of all members can be effective in improving both the child's functioning and their participation in daily life activities. Given the high prevalence of Sensory Processing Disorder among children with ASD, it is likely that their sensory processing difficulties significantly impact not only their own daily routines but also those of their families.

For individuals with autism, the choice of activities directly influences behaviors related to acceptance or avoidance in interactions with people and objects. Deep proprioceptive and tactile stimuli are commonly used to facilitate sensory organization and modulation. It is essential to pay attention to sensory preferences that promote organization, leading to a satisfactory state of alertness for exploring the environment, engaging in meaningful activities, maintaining attention, and expressing positive affection.

On page 27, the girl encounters four suggested daily activities, listed as bullet points: A good bath – providing ample tactile, thermal, and motor planning stimulation, among other benefits, a fidget toy – offering relief from anxiety, especially when used before more complex daily activities, a cup with a straw – as sucking a liquid through a straw provides



proprioceptive stimulation in the oral cavity, aiding in sensory regulation, while massage (deep tactile stimulation) also contributes to organization.

On page 28, an illustration of a fidget toy (a sensory toy in the shape of a wheel, indicating movement and suggesting that it can be spun during use) represents a continuum of sensations and the need to find sensory modulation for positive interactions and learning experiences. The fidget illustration can be created using shiny material—something not initially considered but an interesting addition.

Many autistic individuals are vulnerable to sensory overload, often in situations that would not typically bother non-autistic individuals.

Sensory overload does not appear to be linked to a specific stimulus—such as a loud, high-pitched sound, as seen in hypersensitivity—but rather to the amount and duration of simultaneous sensory inputs and the relationship between sensory input and processing capacity. According to Donna Williams, the threshold for sensory processing can vary depending on the environment and age.

Autistic individuals may experience such extreme sensory overload that it leads to a shutdown of sensory systems, disrupting normal functioning because sensory information can no longer be processed. This shutdown can be total, where no sensory system processes information, or partial, where some systems continue to function. This mechanism may also serve as a way to prevent sensory overload. Donna Williams (1996, cited in Bogdashina, 2003, as cited by Caminha, 2008) suggests that these shutdowns are involuntary adaptations of the brain, which deactivates certain sensory systems to enhance the functioning of others. Temple Grandin (2006) recalls that at age three, she often felt frustrated because, although she could understand what people were saying to her, she was unable to express her own words (Caminha, 2008).

Respecting this assumption, pages 27 and 28 emphasize daily activities, with the aim of adding them to the girl's daily life, bringing sensory modulation, improving the neurological threshold for hyper- or hypo-responses, and relieving sensory discomfort in various activities and interactions. The expectation is to minimize crises due to overload with the sensations inherent to the menstrual period that overlap with sensations already experienced with stress.

Still considering the importance of an organized routine of activities that meet the sensory and behavioral needs of ASD children, these pages 13 and 14, emphasize the importance of



a checking routine, to avoid leaks and other unpleasant situations.

These pages consider that some ASD girls may have interoceptive sensory processing disorder, among others, with dysfunctional perceptions in relation to the volume and speed of descent of menstrual blood. As well as tactile sensory modulation disorder that leads to avoiding the sensation of the tampon in the body or the opposite situation, of not perceiving it and not being bothered by the sensation of it full of blood. In this way, it is necessary to take short breaks to monitor the pad. These breaks can be taken in the interval of 3 or 4 hours while carrying out daily activities.

Yet another situation that can bring about non-adaptive responses is cognitive rigidities, so common among autistic people, which manifest themselves in the difficulty in adapting to changes in both the choice of activities and behavior. And the sanitary pad check comes in as a necessary activity at the time of bleeding and can be minimized by cognitive rigidity, or lead to an overload crisis. Cognitive rigidity manifests itself by difficulty in changing perspective, maintaining specific behaviors even when they are not appropriate for the situation, following rules in a literal way, and resistance to new activities. In this sense, the entry into puberty marked with the first menstruation requires changes in habits that can be extremely difficult and exhausting from a sensory, behavioral and interaction point of view, interfering in the various relationships with activities and people and or leading to crises due to sensory overload.

Page 14 presents the illustration of a large clock, with movable hands, so that the child can move them while trying to mentally fit the activities that fit in the interval of 3 to 4 hours. The colors of the watch can be the traditional colors.

Pages 07 and 08, 11 and 12, 15 and 16

These pages the girl will experience the ideation, motor planning and execution of actions necessary for the removal of the pad from the individual package, its handling, sticking it on



the panties in the region that covers the perineum. As well as the planning to detach the pad from the panties, roll it up, activate the trash can and throw it in the trash.

These actions mark in the cerebral cortex, the integration of tactile and proprioceptive and vestibular processing, essential for the management of the pad. From vestibular, proprioceptive, and visual sensory processing to postural control while sitting on the toilet. As well as for bilateral integration and sequencing actions typical of this task and other sensations inherent to this moment, such as various noises (sanitary napkin bag, self-adhesive tape, flush, trash can, among others) and the smell of blood that even interfere in the affective relationship with menstruation.

For some neurodivergent people, this brain harmony may be at a loss, as altered sensory processing, even in only one direction, disorganizes the chain of responses, interfering with the performance of adaptive responses. When the impairment in adaptive response refers to ideation (cognitive component of the task) or motor planning (brain integration of processing and response plan) or execution (performing the action), this behavior is called dyspraxia. Dyspraxia is understood as the difficulty in performing a new motor action, negatively impacting the learning of this action and daily tasks.

Impaired performance of skilled gestures, referred to as dyspraxia, is consistently reported in children with autism (Larson, et al., 2007). Dyspraxia in autism cannot be entirely explained by impairments in basic motor skills, suggesting the presence of additional contributing factors. Furthermore, praxis in children with autism is strongly correlated with social, communicative, and behavioral impairments (Larson, et al., 2007). Autism is a developmental mental disorder; therefore, it is unlikely that dyspraxia in autism is due to the loss of previously acquired skills, but rather to an impairment in the acquisition (learning) of motor sequences involved in the execution of skilled gestures. Impaired motor sequence learning has been reported in children with autism, and it is important to consider abnormalities in the neural systems involved in motor learning. Motor sequence learning depends on a broad neural network involving primarily connections between the frontal and parietal cortices and subcortical regions: the basal ganglia and the cerebellar cortex (Larson, et al. 2007).

Difficulty with the performance of skilled motor gestures has also been noted, and is one of the most consistent motor findings in children with autism. Difficulties in imitation of skilled motor gestures have been particularly emphasized, leading some to suggest that impaired imitation may be a central feature of autism, attributing it to abnormal development of functions critical for social and communicative development, such as empathy, joint attention, and theory of mind. It has since been hypothesized that autism may be related to



abnormalities in the mirror neuron system critical for imitation and associated with other deficits (Larson, et al. 2007).

Considering that autistic people, because they have several sensory processing dysfunctions, may present some level of dyspraxia, pages 07 and 08, 11 and 12 especially, and 15 and 16 were designed to facilitate this learning.

On pages 07 and 08, 15 and 16, there are 3 illustrations on each pair of pages, presenting a schedule of actions necessary for the placement and removal of the pad in the panties. The purpose of these pages is to stimulate ideation as an essential component of praxis, through visual and auditory stimulation. It focuses on a role model for girls to follow when handling sanitary pads.

The first illustration, on pages 07 and 08, refers to an image, well focused on the girl's hands and on the individual package of pads, which opens this package and removes it from the package. In addition to this image, there is a touch-sensitive button, which when activated, the child will hear the characteristic noise of the package breaking. The second illustration, also with the image focused on the girl's hands and the pad, demonstrates the actions for opening the flaps of the pad and removing the self-adhesive tapes, also with a touch-sensitive button that when activated the child will hear the sound of the self-adhesive tapes being removed. And the third illustration, as well as the previous ones, presents an image with emphasis now on the hands, the pad and the panties, demonstrating how to glue the pad to the panties and adapt the flaps on the outside of the panties. As in the previous illustrations, there is a button that, when pressed, the child will hear the noise of putting the pad in the panties.

On pages 11 and 12, the child will have the opportunity to carry out all the planning and actions necessary to put the pad in and remove the pad from the panties. On page 12, the child will find a life-size pad with all the appropriate characteristics such as size, white color, soft cotton texture, thickness and consistency, flaps with self-adhesive tapes, self-adhesive tape on the pad. When opening these pages, the reader will come across the image of a panty, in 3 dimensions, which rises from the pages and is available for her to experience the handling of the pad (remove the tapes, listen to the noises, stick the pad on the part that covers the perineum and glue the tabs on the outside of the panties). If necessary, the child can experience these pages of the book, imitating the adult with verbal guidance, more directed towards achieving this skill.

Pages 15 and 16 are also presented with 3 illustrations. This illustrations demonstrate the



the removal of the adhesive tabs from the panties. In the second illustration, the image focuses on the removal of the pad from the panties and the noise emitted from this action. The last illustration highlights the action of rolling the pad, activating the trash can and throwing it in the trash.

Pages 03 and 04

These pages talk about the smell of menstrual blood. They emphasize the specific odor due to the union of the natural smell of blood with the smell of natural fluids. As well as the difference between this smell and the smell of natural blood felt in cut situations.

Sweigert et. al, 2020 in their study, concluded that children with ASD had intact odor detection with reduced odor identification ability. Poor odor identification was significantly correlated with the severity of autism symptoms. Importantly, symptoms of sensory dysfunction may further impair social functioning and may contribute to increased restrictive and repetitive behaviors.

Less is known about the olfactory domain in ASD than about other sensory modalities. However, emerging evidence has shown an altered pattern of olfactory processing among children with ASD, with those with greater dysfunction in odor identification also having more severe ASD symptomatology, in particular, social deficits. This finding points to a possible shared mechanism underlying the sensory and social symptoms of ASD (Sweigert et. al, 2020). Certain features of the olfactory system may represent a particular vulnerability to neural alterations and/or serve as a surrogate indicator for impairments in other socioemotional processes (Sweigert et. al, 2020).

Given this assumption, especially the relationship between olfactory processing, emotional signifier and social interaction, page 04 of the book Ruby Blooms, contains the illustration 3 absorbents, in natural size and shape, coated with cotton texture, soft to the touch. On each of them, there is a sage stain, demonstrating to the girl the colors of blood throughout the bleeding period, ranging from normal, darker and denser blood, as coagulated. On these blood stains, there is a surface that, when scraped with the nail, gives off an odor as close as possible to the smell of menstrual sago. The objective of this page is to anticipate the fullness of blood at a safe moment and for the girl to make a positive emotional association.



Pages 05 and 06

These pages present to the reader the possibility of exploring menstrual blood, the texture of blood.

Page 06 contains a white pad, in natural format, soft consistency, and soft coverage, as close to natural as possible. On the pad there is a large smudge stain, so that only the ends of the pad are not marked by the smudge. The blood stain must be produced with material that makes a combination of liquid texture but viscous or slightly gelatinous at the same time. So that the child will be able to touch the blood stain, perceive the consistency and moisture in the tactile sensation, but not get dirty with the material.

Pages 09 and 10

These pages present the girl with sanitary pads in 03 different textures. The goal is through touch, that she has the opportunity to choose the one that best meets her sensory needs.

Page 10 contains the illustration of 03 absorbents, highlighting the shapes, textures and light marks related to consistency and absorption capacities. The first pad has a rectangular shape, slightly narrower in the middle third and rounded at the ends. It has side marks that help in blood absorption and prevent leaks and side flaps for fixing on the outside of the panties. Soft and comfortable coverage. The second pad has a rectangular shape, the tips are less rounded, more evident marks of absorption capacity and soft and comfortable coverage different in the center in relation to the coverage of the extremities. The third pad is also rectangular in shape, rounded at the ends, soft, soft and comfortable cover, marks that differentiate the absorption capacity throughout the peripheral extension of the pad, different cover in the center and at the ends and without fixing tabs. All three pads have a very delicate and thin plastic-like material on the periphery.

As discussed (Serrano, 2016), the Tactile System is located in the skin, and is the boundary between the body and the world that surrounds people. And it is this system that controls the reaction to everything that touches the body or that the body touches. People need touch to stay healthy. The tactile system forms concepts about objects, which influences learning. It is an important system in self-regulation. And it is closely related to the emotional system. (each sensation of touch is related to an emotional meaning)



Pages 21 and 22

These pages address the sensation of wetness experienced by women when they are in the ovulation phase.

In anticipation, especially for ASD girls with tactile sensory modulation disorder in the perineum region, the experience of this humidity is sensation-defining for routine organization and choice of appropriate pad for this phase of the cycle.

As mentioned above, autistic people often experience such a great sensory overload that it causes their systems to shut down. This impairs their normal functioning, since sensory information can no longer be processed. There may be a total shutdown when no sensory system can process the information, or a partial shutdown when some systems continue to function. This mechanism is also used to avoid sensory overload. Donna Williams (1996, cited in Bogdashina, 2003, cited by Caminha, 2008). In this assumption, the anticipated experience of tactile sensation, as well as other sensations, in a safe environment, facilitates the organization of the routine as well as the choice of appropriate products.

Page 21 presents an illustration of the girl, a character in the book. The girl sees a clear, transparent, odorless, slippery textured secretion, and with a consistency that "binds". Natural secretion, which appears in the middle of the menstrual cycle, marking the ovulation phase. On page 22, there is a very thin pad, in the shape of a pad for daily use, simulating a product for daily use (not suitable for bleeding days), with soft and soft coverage, made of icy face mask. The idea is for the girl to put it in her panties and experience the sensation of humidity characteristic of this phase of the menstrual cycle.



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