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Physiotherapists' experiences of the meaning of movement quality in autism: a descriptive phenomenological study

Ingrid Bertilsson, MSc, PT ^{a,b}, Gunvor Gard, PhD, PT^a, and Catharina Sjö Dahl Hammarlund, PhD, PT^a

^aDepartment of Health Sciences, Lund University, Lund, Sweden; ^bHabilitation, Habilitation & Health, Skövde, Sweden

ABSTRACT

Introduction: Movement quality, represented in unrestricted movements, flow and pleasure, is often lacking in people with autism. One aspect is the non-verbal expression of the present emotional and psychological state of an individual.

Purpose: To describe the meaning of movement quality in autism, as experienced by specialized physiotherapists.

Method: Ten physiotherapists were interviewed. The data were recorded, transcribed verbatim, and analyzed using Giorgi's descriptive phenomenological method.

Findings: The general structure of movement quality in people with autism included eight key constituents: 1) reduced postural control; 2) deviant muscle tone and tension; 3) deviant sensory processing; 4) a lack of conscious awareness; 5) difficulties with body boundaries; 6) coordinating movements (including breathing); 7) lack of anticipatory preparations of movements; and 8) need of cognitive thoughts to control movements.

Conclusions: This study provide an understanding of how movement quality in people with autism is expressed. Their lived bodies constantly need to protect themselves from sensory impressions from within or the surroundings, causing emotional distress and obscuring the meaning of their movements. Their bodily expression becomes restrained, fragmented, and hesitant. Understanding movement patterns and emotional reactions following their struggle with movements may facilitate constructive interaction and communication, which give important implications when designing physiotherapy interventions.

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Introduction

This study aims to describe the meaning of movement quality in autism, as experienced by specialized physiotherapists. One important aspect of movement quality is the non-verbal expression of the present emotional and psychological state of an individual (Gyllensten, Skär, Miller, and Gard, 2010). The expressions in body and movements in people with autism are essential in understanding them in the sense of "I that moves." If we can better understand what their bodies are communicating, it may facilitate dialog and interaction with them. A phenomenological approach was chosen to examine the lived experiences of physiotherapists.

The dynamics of lived bodily engagement in encounters with other people create shared meaning. In this context, the body is simultaneously biological, experiencing, expressive, and action-oriented (Øberg, Normann, and Gallagher, 2015). As such, the biological body is a prerequisite for existing in the world (Gallagher and Zahavi, 2012). The experiencing body makes use of perception, in order to sense and interpret

impressions from the surroundings. The sense of movement as perceived in the body has a particular quality that includes how a person feels about it (Sheets-Johnstone, 2011). The expressive body communicates integrated sensory impressions, their psychological interpretations, and emotions related to the experiences, thereby affecting movement quality in the action-oriented body (Gallagher and Zahavi, 2012).

Movement quality

Movement quality has been defined as a general and unifying phenomenon that integrates four dimensions: the biomechanical, physiological, psychological, and existential dimensions of movement (Skjaerven, Gard, and Kristoffersen, 2003). Movement generates and expresses emotions, meaning, and a sense of worth in an individual. Natural movement is characterized by pleasure, flow, and a sense of freedom, both physically and mentally, without any limitations or need to reflect

on how the movement takes place. Natural and unrestricted human movement implies freedom of the body (Wikström-Grotell, 2016). Movement may be used to understand and gain knowledge about the surrounding world (Merleau-Ponty, 2014). Consequently, active movements may result in change and in the development of self-consciousness and self-confidence (Blanke, 2012; Sheets-Johnstone, 2017). How well the acquired knowledge has been consolidated is reflected in the quality of the movement (Skjaerven, Gard, and Kristoffersen, 2003). Hence, the importance of movement in defining who we are as human beings in the world; what Sheets-Johnstone (2011) referred to as “the primacy of movement” becomes evident.

Movement quality and body awareness are interdependent. Body awareness is the ability to be consciously aware in the present and to interpret signals from the body. As such, body awareness gives humans a deeper understanding of themselves. This bodily understanding and meaning are expressed in our movement quality, thus conveying our identity and emotions (Gyllensten, Skär, Miller, and Gard, 2010; Hedlund, 2014).

Autism

People with autism may exhibit deficiencies in: motor proficiency (Kopp, Beckung, and Gillberg, 2010); postural stability (Lim, Partridge, Girdler, and Morris, 2017); sensory-motor function (Whyatt and Craig, 2013); and may be less flexible when attempting to achieve movement goals (Wild, Poliakoff, Jerrison, and Gowen, 2012). Autism frequently involves deviant sensory processing across all sensory modalities as well as in interoception (i.e. in processing signals from inner organs such as the viscera) (Bogdashina, 2017; Noel, Lytle, Cascio, and Wallace, 2018), and in proprioception (Grohmann, 2017). Synesthesia (the stimulation of one sensory organ resulting in an interpretation by another sensory organ) can occur in some people (Bogdashina, 2017). The ability to process and integrate multisensory impressions is also often affected (Bogdashina, 2017; Noel, Lytle, Cascio, and Wallace, 2018). People with autism may also display a lack of central coherence, that is, the ability to combine details to represent a sense of wholeness (Frith and Happé, 1994). Since the specific combination of problems varies among individuals, so does the manifestation of the autism diagnosis (American Psychiatric Association, 2013).

Consequently, people with autism often perceive the surrounding world differently, and they may find it difficult to understand that other people’s feelings, intentions, and thoughts can differ from their own (Rajendran and Mitchell, 2007). Furthermore, they may not understand that behavior can originate from

their own emotions and inner states (Rizzolatti and Fabbri-Destro, 2010). This can impede their communication skills and social interaction, making the context less understandable and meaningful to them (Bogdashina, 2017).

Only a few studies have investigated how young adults with autism experience their body and movements. In a previous qualitative study (Cesaroni and Garber, 1991), two young adults spoke about how their movements affected their well-being and ability to maintain daily activities. They experienced that people around them considered their movements to be stereotyped and disturbing. The effort required of them to ensure that their movements were considered “normal” by others resulted in a higher cost in terms of mental energy expended and anxiety. Arnell, Jerlinder, and Lundqvist (2018) found that adolescents with autism required adaptation, such as predictability or freedom of choice of activity, if they were to experience participation in physical activities.

The ability to be active or to feel a sense of participation depends on the body functions of the individual (Grohmann, 2017). In a mixed-methods study, young adults with autism reported a range of body function issues that disrupt their ability to understand and feel that their body is coherent and whole (Bertilsson et al., 2018). The participants also reported problems concerning being consciously aware, coordinating body parts, and being in control of one’s body and movements. They described contradictory feelings regarding their bodies and movements. Also, they reported that negative feelings about their bodies and movements made them feel more unsettled, whereas positive feelings helped them cope with everyday activities (Bertilsson et al., 2018).

Although several phenomenological studies of movement quality have been published to date (Skjaerven, Gard, and Kristoffersen, 2003; Skjaerven, Kristoffersen, and Gard, 2008, 2010; Skjaerven et al., 2019), we have been unable to find any study of movement quality in people with autism. By recognizing the quality of movement, we may better understand the meaning of “I that move” in people with autism. This understanding may scaffold new interventions based on the individual’s lived body as expressed in the movement quality. This may further strengthen the individual’s inner resources. This study aimed to describe the meaning of movement quality in people with autism, as experienced by specialized physiotherapists.

Method

This study followed Giorgi’s descriptive phenomenological method (Giorgi, 2012) in describing the experiences of specialized physiotherapists. Data collection

consisted of interviewing participants individually as per applied phenomenology (i.e. one subject taking part of the experiences of another subject concerning the phenomenon) (Englander, 2012). The interviews ranged in duration from 44–87 minutes. About one week prior to their interview, participants were asked to think back on situations in which they had lived experiences of the phenomenon, and, when doing so, to focus on their individual experiences of movement quality in people with autism. This approach was intended to generate a rich body of data (Englander, 2012).

The analysis consisted of six critical systematic and methodological steps: 1) Reading the interviews through to gain a sense of the whole, focusing not only on the linguistic content, but also on the intentional, lived experience; 2) establishing meaning units from the texts; 3) rewriting these meaning units into third-person expressions; 4) transforming these into sensitive expressions, making the psychological value of the data explicit; 5) determining the structure by first distinguishing the constituents of each description and then analyzing them together to gain an understanding of the general pattern; and 6) performing post-structural analyses (Giorgi and Giorgi, 2003).

The general structure consisted of key constituents that were immediately implied and interrelated (i.e. features that at least 9 of 10 participants described as present and apparent in movement quality in autism). In addition, potentially implied elements (Broomé, 2011) were identified; that is, aspects that several participants described as being present, but which were not obvious as key constituents (Giorgi and Giorgi, 2003). Both immediately implied key constituents and potentially implied elements were illustrated with quotations to describe the essence of the phenomenon (Giorgi, 2009).

The phenomenological analysis aimed to describe the essential meaning of movement quality in people with autism, as experienced by physiotherapists (Giorgi, 2009). A scientific phenomenological reduction approach was adopted; i.e., reading the text with an open mind and being conscious of aspects in the data, which have a special sensitivity toward the phenomenon being investigated. Reflection and imaginative variation were used to uncover any possible nuances in understanding and to describe the phenomenon with disciplined naiveté (Giorgi, 2012).

Participants

Participants were selected using purposive snowball sampling (Bloor and Wood, 2018). All were physiotherapists specializing in body awareness and movement quality in people with autism. They were

recruited nationally in Sweden and were first approached by e-mail. If they responded positively to the invitation to participate, they were contacted by telephone. This study complied with the Helsinki Declaration, and all participants gave their written, informed consent to participate. The study was approved by the Regional Ethical Review Board in Gothenburg, Sweden (ref. no. 651–17).

Three declined to participate due to changes in their professional duties. Ten physiotherapists, all female, aged 43–62 years, agreed to participate. They had 3–35 years' experience of body awareness therapy and of observing movement patterns in and treating people with autism. They practiced physiotherapy on people with autism of all ages, from infants to adults.

Data collection

Data were collected between September 2017 and February 2018. The study's participants had no previous knowledge of the interviewer (IB), although by the time of their interview, they were aware of her clinical and academic experience, including her experience in qualitative research. Participants were asked to describe their experience of movement quality in people with autism in their own words.

The interviews were performed individually and took place in the participants' clinical settings with the exception of one interview, which was held at the interviewer's clinic. The interviews were guided by themes to help maintain focus on the phenomenon. These themes were: 1) The participant's general description of movement quality; 2) detailed aspects of movement quality experienced when meeting people with autism; and 3) perceived similarities or dissimilarities in movement quality as experienced in different people with autism. The interviews were recorded and brief field notes were taken.

The interviews were transcribed verbatim by the first author (IB). The scripts were subsequently returned to each participant to give them the opportunity to adjust or add information, so as to provide a full and correct description of how they experienced movement quality in autism. The data collection ended when no new information was added to the descriptions.

Data analysis

First, two of the study's authors (IB, CSH) read the raw data individually in order to capture the essence of each interview. The subsequent coding of the data by the first author (IB) resulted in 251 sensitive expressions derived from the ten participants. The sorting of these expressions into categories was discussed by two of the

authors (IB, CSH). The first author (IB) then continued by checking each category, returning to the raw data. This stage of the analysis revealed whether a category should be labeled as a key constituent or a potentially implied element, making preliminary results available. Finally, each author performed an independent, overall post-structural analysis of the preliminary results, and all participated actively in the following discussions, resulting in a consensus concerning the final results. The authors followed the COREQ checklist of consolidated criteria for reporting qualitative research (Tong, Sainsbury, and Craig, 2007) to enhance the study's transparency and trustworthiness.

Results

General structure

The results of the analysis included a general structure that consisted of eight interrelated immediately implied key constituents.

Key constituent 1: reduced postural control

The participants experienced that postural control was affected by the disordered orientation of body parts in people with autism, diminishing their stability limits. This orientation caused their posture to be either slouched or hyperextended. Stability was described as being sufficient to maintain an upright position, but at the cost of a high degree of energy expenditure and a lack of flexibility. Postural stability was perceived to be the foundation for other movement qualities.

“They almost always keep their balance very far back, except for one person who, in principle, felt as if he were tipping forward [...]. It's often difficult for them to find any hip flexion, since they're kind of blocked in their pelvis; there's no flexibility, and they can't even find movement [to correct their posture].” (P1)

Key constituent 2: low muscle tone and tension

The participants described low muscle tone as a primary symptom in children with autism, which affected their ability to exert and balance muscle force. The effect on movement quality was described as a lack of flow, vitality, and energy. Compounding these experiences was the fact that participants described the frequent development of active muscle tension in people with autism. Movement patterns became inflexible and unstable, and this tension was difficult to remedy. Also, the movements were described as controlled from the upper body, which

further affected posture and breathing. Participants experienced the flow of the movements to be slow and sequential.

“Their muscle tone isn't well-regulated [...]. The exertion of muscle force is poorly adjusted. The whole system is affected, there's no flow. It becomes jerky.” (P1)

“They tense up to compensate [...] and when they're 10-15 years old, the tension might cause aches.” (P9)

Key constituent 3: deviant sensory processing

Participants described how deviant sensory processing was related to behaviors intended to protect oneself. For instance, a sensitivity to visual stimuli could lead to a need to shield or protect oneself from them, thus restricting the person's movement quality and expression. The participants assumed that the reduced access to intelligible bodily signals created fear of free movement.

“She was sensitive to light and wore sunglasses, with extra glasses on top, and

was led by her father. Of course, since she needed to shield herself in the way she did, this had a huge effect on her movement pattern.” (P9)

“It calls to mind a particular child who found it very difficult to understand sensory impressions. When she was very young, she turned from supine to sitting up with fear in her eyes. I believe this shows in how little she has wanted to use her body.” (P3)

Key constituent 4: lack of conscious awareness

According to the study's participants, the tolerable level of sensory input for people with autism when perceiving their bodily signals and surroundings was reduced. This led to a lack of conscious awareness.

“It's difficult to sweat, breathe, and feel your heart pound. This is the perceptual stuff, and you need to get into the habit of coping with. It's an experience from within that you need to be able to handle.” (P3)

“To endure, it's like dosing the experiences of oneself. And many with anxiety can't bear to experience themselves in any large dose. Neither in time, nor in amount.” (P7)

“When the perceptual difficulties are extensive ... then I see another kind of presence, or sometimes absence, in their bodies [...]. The way you process perceptually is quite critical in how you use your body.” (P3)

Key constituent 5: difficulties with body boundaries

People with autism were described as experiencing difficulty in perceiving their bodies spatially. When

information about their body boundaries failed, they kept their movements to a minimum, thus moving within safe boundaries.

“The body boundaries – where a person experiences that their bodies begin and end – can be difficult [to comprehend]. If they lie down on a mat, it can be difficult to imitate how to lie, and they might first place their bodies outside the mat and then adjust. They can’t sense their body parts.” (P2)

Key constituent 6: coordinating movements

Coordinating movements, both diagonally in rotation and between body halves or parts, was experienced to be a major problem and also to affect breathing. The ability of centering movement was thereby also affected, as the flow of movements through the center was hindered, leaving body parts disconnected from each other. The affected breathing was also understood to be an effect of shielding themselves from impressions, but that further affected the possibility of centering movements. As such, it was important to tackle this difficulty with care.

“Seemingly simple movements can be difficult.” (P8)

“Breathing plays a major role when it comes to centering. I adopt a more relaxed approach to challenging breathing here at habilitation [when meeting people with autism] than I do in primary care.” (P7)

Key constituent 7: lack of anticipatory preparations of movements

The participants experienced that people with autism lacked responses to expected changes; in the environment, for an upcoming bodily action or for postural necessity. This was assumed to indicate that anticipatory preparations for an intended movement were lacking.

“They don’t have control over how to lift one leg, they haven’t transferred the weight to the other leg before lifting.” (P3)

Key constituent 8: need of cognitive thoughts to control movements

The participants’ narratives also highlighted that cognitive thoughts, such as “straighten up”, were needed as compensation to move, and in doing so, to adopt an external view of oneself. These exhortations were presumed necessary in order to perform movements. The physiotherapists described how they experienced that holding oneself together cognitively required both

mental and physical energy, which made it difficult to focus. The participants experienced that increased tension when controlling movements cognitively could block breathing.

“We all have muscle tension. [...] But when you can’t be in your bodily experience – being constantly in your head and analyzing – it makes automation difficult [...], thinking about every little aspect of the movement pattern, and it not being automated. That’s specific to this group. And it makes you more tense.” (P5)

Key constituents’ interrelatedness

The participants experienced all of the above key constituents describing movement quality in autism as being interrelated and as creating a movement quality expression for people with autism. This expression included the perception that people with autism lacked a body that was available to them; a body in which they could rest, feel safe, or be active. The bodily resources of people with autism might conflict with their cognitive planning, leading to a lack of self-understanding and a loss of the intention to move relative to the movement itself. Participants experienced that people with autism were distressed by these circumstances and that their sense of coherence was jeopardized, leading them to distrust themselves and their surroundings. Instead of deriving pleasure from their body and movement, a fear of movement became more tangible. These interrelated movement quality aspects resulted in a movement expression that was described as restrained, fragmented, and hesitant, and therefore without a sense of being a coherent whole.

“Trying to put body parts together into a whole, thus making it comprehensible, in order to understand the world and oneself. [...] You live your body, and when communication doesn’t add up between body and soul, it’s difficult. [...] Understanding the world emanates from [within] you.” (P10)

“The first word that comes to mind is restrained. Both in contact and body expression. [...] Fragmentation can be seen in both the movement pattern and when it comes to awareness. It’s all linked. Fragmentation is where breathing and movement fail to connect. They won’t coordinate. [...] Looking at yourself from outside instead of from within, there’s no sense of being whole.” (P7)

Potentially implied elements

Potentially implied elements helped provide further understanding of the underlying meaning of movement quality in autism.

Element 1

Participants described young children with autism as having difficulty understanding pain as a sensory impression, which affected their movement quality.

“You can see that they’re in pain, but they might not show it in the same way other children I meet do. They may have difficulty expressing and showing the pain. Still, you notice some kind of frustration sometimes; there’s something wrong when they exert movements.” (P3)

Element 2

Younger children were reported to derive pleasure from moving. Generally, this pleasure was curbed during their upbringing due to negative experiences from within, such as deviant proprioception/interoception, and from failing to live up to the expectations of others. Later in life, some young adults seemed able to change and recapture the feeling of pleasure from their body and movements. Others were described as lacking this ability, leaving them with a feeling of neither understanding nor connecting to themselves.

“There’s a will to move as a young child, as with all children. [...] but then they encounter situations where they need to act in a certain way [...] and all the time they hear that they can’t do much, or that what they’re doing is wrong [...]. Such experiences in relation to movement and motor actions will not make them positively disposed to moving at all.” (P8)

“She really didn’t like her body. I imagined this emanated from all the failures she’d been exposed to. At one time, she enjoyed dancing and felt the joy of moving [...] but she just quit.” (P3)

Element 3

Although some people with autism may appear to be functioning well at first glance, it was reported that difficulties with impaired movement were frequently discovered upon further examination. In the participants’ experience, since people with autism had difficulties recognizing their own bodies, they did not know when to ask for guidance, which could possibly lead to severe problems at a later date:

“She had no understanding of her body. [...] She had been in contact with habilitation for a long time, but without physiotherapeutic contact since she wasn’t thought to have any motor problems. Major problems with pain and so on could have developed. [...] There’s so much more involved than just motor behavior when it comes to the body and movement.” (P9)

Element 4

Participants described the development of cognitive functions in people with autism as being negatively

influenced by both deviant sensory impressions and motor actions.

“You don’t have access to your entire body and all its resources. [...] I think this not only affects the body but also cognitive functions. If you’ve ignored your body’s need for movement and freedom to breathe ... to take care of your body in order to feel good, to sleep, and so on, after a while it affects the cognitive functions. You don’t have the same attention span, the same concentration, or the same perseverance.” (P4)

Element 5

Participants described that some people with autism sought resistance to movement, either consciously or unconsciously.

“He couldn’t feel where he had his body parts [...] and he learned a lot from connecting to the floor in order to direct and personally experience where he was [...] in order to feel where his body started and to exert movement to counteract resistance. Then the penny kind of dropped, and he had the will to learn and to do things.” (P5)

Discussion

The lived meaning of movement quality in autism was explored based on the experiences of specialized physiotherapists. The main findings in our study was that the expression of the movement quality in autism was described as being fragmented, restrained, and hesitant – there was a lack of wholeness. People with autism were described as living a body that was partly unavailable to them. Their movement quality lacked vitality and energy, and their movement pattern was tense, inflexible, and unstable. The participants assumed that fear of moving, feelings of distrust, and difficulty interpreting the surrounding world could be understood to originate from the limited access to bodily signals and deviant sensory processing, making people with autism restrain movements. People with autism were described to disconnect their bodily signals as a protective strategy, which interfered with their conscious awareness. Other strategies they employed included keeping movements to a minimum and within safe boundaries when coordination and information about their body boundaries failed. As a result of all the above-mentioned difficulties that the participants had encountered, they also experienced that cognitive thoughts could be used as a compensation, when information from the body and movements was unavailable and the understanding of “I that move” had become blurred. The participants felt that this could be to the detriment of intention, since the body could not be proactive and exert movements with flow and sense-making. All these aspects

were experienced to leave people with autism living a body in which they could not rest, feel safe, or be active.

The lived experiences of movement quality in people with autism included an absence of vitality due to low muscle tone seen especially in younger children and also reported by Serdarevic et al. (2017). This low level of muscle tone was perceived to influence postural orientation and stability. Posture, that is postural orientation has been shown to reflect your inner experiences and emotions (Bullington, 2012). Our results also revealed secondary muscle tension and a struggle to maintain an upright posture using upper-body muscles. This struggle was perceived as consuming a great deal of energy and further interfered with both postural control and breathing.

Creating movement is creating perception, and vice versa, and is thereby a source of knowledge (Sheets-Johnstone, 2011). In our study, perception was experienced as a major problem in autism. The unconscious action of perception is supposed to allow the subjective body to exist in the world without having to control it. The lived body with its movements is there to sense-making; our primal sense of being alive (Sheets-Johnstone, 2011). For people with autism, differences in experiencing, perceiving, and moving will determine what experiences are consolidated and embodied, hence forming the basis for the expression in movement quality (De Jaegher, 2013).

To experience the meaning of a context, sensory impressions need to be concordant (Gallagher and Zahavi, 2012). In our study, an understanding of oneself was difficult for people with autism to achieve due to deviant bodily signals, which reduced the possibility of multisensory integration. Adding to that the fact that deviant sensory impressions as present in autism (Bogdashina, 2017) do not temporally combine properly to one another, the result is that people with autism are left with less temporal acuity (Noel, De Nier, Lazzara, and Wallace, 2018). This may increase the disorientation for the lived body. Since the intention behind a movement supplies it with meaning (Sheets-Johnstone, 2017), disorientated multisensory integration may interfere with this connection, rendering a movement with failed meaning.

Furthermore, the experience of participants in this study was that the ability to process sensory impressions was a prerequisite for conscious awareness, as has been reported previously (Zhu, Drewes, and Melcher, 2016). The lack of ability to mentalize and reflect, often present in autism, may lead to mainly concrete thinking (Bogdashina, 2017), which, in part, may also explain the difficulty of being consciously aware. This ability is

essential to understanding body signals in order to develop the body identity (Gyllensten, Skär, Miller, and Gard, 2010) and bodily self-consciousness (Blanke, 2012). The ability to be consciously aware influences how intention and the meaning of actions are created (Skjaerven, Kristoffersen, and Gard, 2010).

The participants described that people with autism had difficulty feeling their body boundaries. Difficulties with imitation, as observed in autism, may imply that the boundary between oneself and another becomes blurred, which may lead to a lack of access to a coherent self (Manning, 2009). This may explain that people with autism were described to keep their movements to a minimum within safe and sharper boundaries, as experienced by the participants.

Coordination problems in any pattern, especially centering, were described as frequently occurring in autism. This lack of bodily centering corresponds with the lack of central coherence in autism; that is, the inability to appreciate, interpret, and understand not only details, but the whole picture (Frith and Happé, 1994). Another finding in this study was that lack of centering may, in part, explain the lack of fluency (i.e. body parts failing to work together) seen in people with autism, thus affecting their experience of being in control of their actions. Whether movements happen to us, or we make movements happen, we attend the experience of self-movement and unfold a dynamic with temporality (Sheets-Johnstone, 2011). If, as the results of our study show, these movements are uncoordinated and sequential, this dynamic will lack intention and meaning. This finding agrees with previous research on movement quality (Skjaerven, Gard, and Kristoffersen, 2003). Having autism may equate to living in a world where the body consists of separate parts that do not all know each other and do not share the same intentions, resulting in a lack of bodily central coherence.

According to the participants, responses to expected changes in the environment or for an upcoming bodily movement may be lacking in people with autism, supported by the findings of Noel, De Nier, Lazzara, and Wallace (2018). The absence of feed-forward mechanisms will compromise the smoothness and goal-directedness of movements, and hence the flow toward an intentional goal (Shumway-Cook and Woollacott, 2012), described by Merleau-Ponty (2014) as “motor intentionality”. Each movement experience shapes the embodied mind (Sheets-Johnstone, 2011) and consequently also autonomy; that is to say the self-generating, self-organizing, and self-distinguishing body inferred as the identity of the individual (De Jaegher, 2013) may be compromised when anticipation

is lacking. Growing up with deviant perceptual functions will influence sensorimotor functions and experiences, and hence also long-term memory regarding body and movement. This may further affect the development of the anticipatory function of movements, since it builds on experiences (Shumway-Cook and Woollacott, 2012).

Another finding was that cognitive thoughts were perceived to be necessary for people with autism to plan their movements. When people with autism generate movements via cognition rather than bodily impressions, these movements may less likely be automated. Cognition is a modification to our primary being in the world (Gallagher and Zahavi, 2012). A finding of this study was that if the perceptive body does not guide movements, but conscious thoughts control them instead, meaning and movement quality will be compromised.

In this study, it was stated that young children with autism had difficulties understanding pain as a sensory impression, whereas older children were described as exhibiting both pain and a distrust of their bodies. Since people with autism may overload and thus wear out their bodies, pain of a chronic, fibromyalgic character may arise (Henriksson, 1988) and interfere with their movement quality expression. However, as our results show, people with autism have difficulty experiencing bodily signals and do not always recognize when to seek care.

Some of the participants described how deviant movement abilities had a negative influence on cognitive functions. This correlates with the phenomenological view of agency that develops from “I move”, to “I do”, and to “I can”, i.e., how the dynamic system of kinesthesia acts as a foundation for developing cognition (Sheets-Johnstone, 2017), where sensorimotor, cognitive, experiential, and affective aspects of embodiment are brought together (De Jaegher, 2013; Grohmann, 2017).

Another interesting finding was that study participants noted that people with autism needed resistance or the feeling of a hard surface to enhance bodily signals and understand their bodies better. To our knowledge, there is as yet no study that explores this strategy specifically. In everyday life, people with autism do not have access to these enhanced bodily signals, and hence, may lack in intelligible bodily information.

The meaning of movement quality reflects the indivisible link between body and mind – the embodied individual – where embodiment is being anchored in all of one’s abilities in bodily action, either independently or as part of others. This anchoring will affect the development of all body functions, be they sensorimotor, cognitive, affective,

or experiential (De Jaegher, 2013). The main experience shared by all the physiotherapists participating in the study was that movement quality in autism can be described as fragmented, restrained, and hesitant. The results of this study provide important insight into how the lived body is expressed in movement quality for people with autism as an embodied individual, as derived from physiotherapists’ experienced aspects of movement quality. From a philosophical perspective, De Jaegher (2013) theorized that enaction brings together all body functions. Our results support this theory from sensorimotor and psychological perspectives, in which enaction will show in movement quality. These different disciplines thereby support each other in the phenomenological experience of embodiment in people with autism.

Implications

Our study found that seemingly undisturbed motor performance in people with autism often belies difficulties with movement quality, which needs to be addressed from a clinical perspective. Although we have found problems in the lived bodies, there are also bodily resources available to develop. The will to move described in younger children with autism suggests the possibility of experiencing the body and movement as joyful. Understanding their movement patterns and emotional reactions following their struggle with movements may facilitate constructive interaction and communication. Adequate interventions, such as enhancing sensory inputs, may help guide people with autism by strengthening their bodily resources, allowing them to experience positive feelings associated with body and movement. An example of this may be to guide the individual verbally and/or manually to dare to try alternative ways to perform a movement, with the therapist safe-guarding the dosing. This may develop movement quality, thus strengthening the individual’s inner resources.

Limitations

The participants in this study were physiotherapists working in specialized habilitation care. They have experience working with people with autism whose needs are greater than what is generally the case. On the other hand, focusing on more serious needs may have helped crystallize the problems that might appear in relation to movement quality in autism, even where such problems are less prominent, and by doing so, increase the potential to recognize them. Nonetheless, it is more common that people with

autism do experience such difficulties, and the general structure, with its interrelated key constituents, describes the situation of being “I that moves” when having autism. The theories underpinning the different body awareness techniques represented by the participants may have affected the responses.

Conclusions

People with autism live their bodies, which do not necessarily manifest their intended movements. Their lived bodies constantly need to protect themselves from non-understandable impressions from within or from the surroundings, which causes emotional distress and obscures the meaning of their movements. Their bodily expression becomes restrained, fragmented, and hesitant when the bodily foundation for living in the world was experienced as compromised. This bodily expression may also entail fear of moving, distrust and difficulty interpreting the surrounding world. The results of this study provide insight into how the lived body is expressed in movement quality for people with autism as an expression of the embodied individual. There is a need to disrupt the spiral of negative bodily symptoms in a way that is adapted to suit the needs of people with autism in order to increase their bodily self-consciousness.

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Declaration of Interest

The authors declare no conflicts of interest.

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ORCID

Ingrid Bertilsson  <http://orcid.org/0000-0001-9547-162X>

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