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Original Citation

Lyon, Steve and Adams, Karen (2014) Brain-based health visiting: How neuroscience is shaping practice. *Journal of health visiting*, 2 (3). pp. 142-146. ISSN 2052-2908

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Brain-Based Health Visiting: How Neuroscience is Shaping the Role of the Health Visitor

Abstract

Health visitors have always been faced with change and challenge to their role. This is partly a result of health visiting being underpinned by a set of 'soft' skills that are difficult to articulate. This article suggests that the relationship-building skills of health visitors can now be underpinned by evidence from developments in neuroscience. In this paper the neuroscience behind many of the core interventions that health visitors have always used are discussed and their relationship to managing emotions and stress are addressed. Neurohormones such as oxytocin, cortisol, and dopamine are described in the context of health visitor-mother relationships and how this can benefit babies. This paper explains simply, important brain structures and how health visitors can work with these.

Introduction

For health visitors, relationship-building skills are like a skin, something that has always been there, and therefore not regarded as being special. As a result the profession downplays a set of skills that are complex to learn but which profoundly benefit the clients they engage with. Now, thanks to advances in neuroscience, the effects of these relationship-building skills are being researched, and we can celebrate the important work of health visitors.

The DH Guidance on educating health visitors for a transformed service (DH, 2011) emphasises a number of areas where there are current gaps, and this includes a knowledge of neuroscience. The recent interest in neuroscience, and in particular the parent's brain, its development, and its links with the infant's attachment, are ripe for further exploration regarding their impact on health visitor practice, and this article aims to address this gap.

This article looks at the brain, the limbic system, and associated neurohormones and how the health visitor's work can impact on these.

The Brain

This section provides an overview of relevant parts of the brain before going on to explore how these can be affected through the health visitor relationship.

The brain is divided in two halves. The left brain is associated with decision making, goal direction and motivation. It is the seat of language and can facilitate emotional management when clients use their left side of their brain to provide words to describe emotions. Clients usually have a more dominant (active) hemisphere, with the left being associated with optimism and motivated behaviour whereas those with a more dominant (active) right hemisphere tend to be more pessimistic and avoidant (Schore, 2011; Siegel, 2013; Davidson and Begley, 2013). Although more complicated than what is presented here, mothers with post natal depression are more likely to have a more active right hemisphere (Schore, 20011), and health visitor's work can take account of this (see later).

The brain has a more developed part; the cerebral cortex (new brain), which is responsible for rational thinking and decision making (executive functions). The cerebral cortex can help apply a brake on more impulsive behaviour and may encourage the client to think about some of their less helpful reactions. Mentally unwell mothers with right hemisphere difficulties may be unable to apply these brakes (Milne et al, 2009). The orbito-frontal cortex and anterior frontal cortex seated

just behind the eyes is involved when mothers become attuned to the needs and moods of their babies and older children, allowing them to respond appropriately. The fusiform which is part of the parietal area at the back of the cortex is also involved in 'tuning' into the physical needs of others (Davidson and Begley, 2013) and is implicated in mother's empathic understanding of their babies.

The limbic system (old brain)

The limbic system comprises a primitive and complex set of structures consisting of specialised areas associated with emotion and automatic responsiveness. Under stress, these parts of the brain can become hyperactive and whilst useful in emergencies can create their own set of problems. A hyper-responsive limbic system may misconstrue harmless situations resulting in a mother constantly on the defence and looking for danger. Important parts of the limbic system include the amygdala which is associated with fear responses (LeDoux, 1996; Grant et al, 2011), the hypopituitary which is involved in the stress response, the insula which is involved in empathy (see Davidson and Begley, 2013 for a review). The health visitor can affect these structures through some of the skills they use to engage with clients.

The neurohormones, oxytocin and dopamine, affect the limbic system. As we later discuss, the health visitor can utilise a knowledge of these hormones in working with mothers, especially those with low mood and where there are some initial attachment difficulties.

Oxytocin

Oxytocin is implicated in attachment and care giving behaviour (Strathearn, 2011; Kumsta and Heinrichs, 2013). Normally, it is very much abundant at childbirth and beyond when it motivates mothers to look after their babies. Under the influence of oxytocin, mothers will care for the physical needs of their babies, and it also helps in the development of a secure attachment (Strathearn, 2011). Oxytocin is a natural stress reducer, which targets the amygdala making the mother less fearful (Riem et al, 2011) and facilitating the experience of care giving as a rewarding (Hughes and Baylis, 2012). Unfortunately, in some mothers, oxytocin may be either at a low level (Pierrehumbert et al, 2012) or may actually trigger a stress response (Gilbert, 2013).

Dopamine and Cortisol

Dopamine is also implicated in rewarding care giving in mothers (Strathearn, 2011). Dopamine is also associated with goal-directed behaviour. Low levels of Dopamine occur in both postnatal depression (Moses-Kolko et al, 2011), and in Parkinson's Disease, where the difficulties in 'getting going' are plain to see. People with Parkinson's Disease find it extremely hard to initiate action and once started they find it difficult to switch to another task. This is not unlike postnatal depression where mothers find it challenging to start a task. They also demonstrate difficulties in switching to other tasks and engage in 'stuck in a rut thinking' termed 'rumination', when a mother is unable to get out of a low mood and is unable to stop thinking self critical thoughts (O'Mahen et al, 2012).

In post natal depression, low levels of oxytocin and dopamine may also be present (Strathearn, 2011). There may also be a rise in cortisol levels, which may sometimes have an adaptive function, but is also more often associated with the negative effects of stress. As we discuss later, many of the core interventions offered by the health visitor may help increase both dopamine and oxytocin levels and buffer some of the impact of cortisol.

Not so Basic Skills

So how might some of the core interventions offered by the health visitor impact on the brain and neurohormones ?

The skilful management of first contact can impact on the brain in profound ways. Mothers with post natal depression or anxiety may be very defensive in their interactions with others – this includes partners, parents, and their babies. The self criticism associated with post natal depression (O'Mahen et al, 2012) increases their expectation of being rebuked by others. Their amygdala is primed to seek out critical/hostile faces (Grant et al, 2011) and the health visitor may be perceived as a professional who is bound to judge them as somebody lacking the necessary parent skills (Poole et al, 2006).

Non-verbal communication on first meeting, often seen as a rather basic skill, can start to build a secure base for the health visitor and parent relationship. Eye-contact, a smiling face, and expressions that convey that there is a commitment to understand and not judge, will set in motion the start of an important partnership. The initial moments of contact between health visitor and mother help to de-activate the amygdala and decrease the overall stress levels. As cortisol levels reduce, the potential for a helpful relationship where mothers are able to risk sharing their concerns, is increased. This may be contrasted with those mothers who are overwhelmed by stress and where there is increased risk of blocked parenting behaviour (Porges, 2011; Pierrehumbert et al 2012; Hughes and Baylis, 2012). Despite limited research (but see Panksepp and Biven, 2012, for a review), we are suggesting that the health visitor – mother relationship naturally boosts the oxytocin level a hormone released through positive relationships and this will also reduce stress.

In the presence of a helpful and non-judgemental relationship, the mothers stress levels are further reduced and the baby is the recipient of the benefits of this. Babies are able to pick up on the stress levels of their mothers and this may set up cycles of disengagement (Kurth et al, 2011). Mothers can be reassured by the non-verbal expressions of their health visitors and this can enable the sharing and labelling of difficult emotions that often surround childbirth. The health visitor who strives to be what Wilkinson (2010) calls 'loving, attuned, and self-possessed' provides the "container" and then eventual attenuation of difficult feelings and thoughts. The loving, attuned and self-possessed health visitor is communicated through non-verbal processes, what Porges (2011) terms smart vagal work.

The initial contact therefore lays the ground for a collaborative relationship, the importance of which cannot be over-emphasised as a means to reduce stress. Collaborative relationships enhance self-efficacy (self-agency) and its benefits have been widely described in terms of its association with child development and attachment (Fonagy et al, 2004), its role in reducing stress (Bandura, 1997), and its importance in health visiting (Smith and Horne, 2012; Whittaker and Cowley, 2012) and in maintaining positive behaviour change (French et al, 2011; NICE, 2014).

Regulating emotions

Parents who have experienced difficult childhoods where attachment was insecure are particularly likely to find the perinatal stage a challenge, because of their own difficulties with emotional regulation, and the fact that the infant may trigger powerful emotions and a potential for blocked parental behaviour (Porges, 2011; Hughes and Baylis, 2012; Beebe, 2013). These parents are likely to need

Comment [A1]: The research by Davies et al (2006) also shows that is programming the infants brain (i.e. babies of depressed mothers have more active right hemispheres.

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Comment [A4]: You might also mention the recent work of Beatrice Beebe who highlights the role of parents inability to regulate their emotional states and its impact on attachment.

considerable help from the health visitor (initially) and may require help from specialist mental health services, later. The health visitor can help the parent to manage their emotions through stress management and other interventions. Psychoeducation is a rather grand term for interventions that are aimed at normalising difficult emotions and involves the health visitor helping parents, and especially mothers, to recognise that their emotional reactions are normal, and are experienced by many women during the postnatal period. This seemingly simple intervention can have a powerful effect on a mother and encourage further declarations of difficult emotions. The health visitor can make good use of what Williams, Cantwell and Robertson (2012) calls the five systems approach this model enables a health visitor to link the five areas of thought, emotion, behaviour, and physical symptoms and how environmental situations trigger difficulties. Such a simple model facilitates helping the mother put into words difficult thoughts and moods and appreciating their link with physical symptoms and unhelpful behaviour. This intervention is consistent with what has been termed a “top down” approach to regulating emotion where the rational brain is enlisted to manage the emotions generated within the old brain or limbic system (Leahy et al, 2011).

Empathic responses are also part of this top down emotion-regulating approach. The empathic health visitor helps the mother to put into words some of her difficult experiences. The labelling of emotion by itself can help mother’s to manage their emotions (Wallin, 2007), as a result of the health visitor facilitating a shift from the right brain to the left brain and enabling neuronal connections to develop between the more positive left brain and the right brain and the limbic system (see Wilkinson, 2010 for a review of this process). In this way, the stressed limbic system which is in an unhelpful “runaway” mode starts to come under the control of the mother who feels her emotions are much more manageable.

Mothers in an empathic relationship are more likely to offer this quality to their own children (Hughes and Baylis, 2011). Through a coaching model, health visitors, can shape a mother’s empathic responses (Gottman 1996; Meins et al, 2011). They can bring the mother’s attention to the moods and needs of her child.

Over-stressed mothers can experience extreme negative thoughts and this is what drives depression (Beck, 1979; Beck, 2012). The evidence is that post natal depression is likely to result in a continuous stream of unhelpful thoughts where typically mothers experience themselves as worthless, imperfect, and unlovable as mothers (O’Mahen et al, 2012). Thus, vicious cycles are set up that become difficult to break, and generate considerable stress that further interfere with parental behaviour. The non-judgemental health visitor encourages a more compassionate stance towards these thoughts and invites mindful scepticism and this lessens self-criticism and depression (Gilbert, 2013).

Increasing Dopamine and motivation

Health visitors have a well earned reputation for motivating mothers, and when they do this there are important changes in their brain. Goal setting in itself is motivating and involves a shift from right hemisphere activity to the left hemisphere, which is associated with motivation, approach behaviour and the release of rewarding dopamine.

Skilful and collaborative goal setting focused on positive parenting behaviours can set in motion a virtuous cycle in which mothers may find that simply going through the motions may result in eventual reward, and reinforcement as dopamine starts to effect those parts of the brain associated with motivation: the nucleus accumbens

(Davidson and Begley, 2013). Activating people towards the setting of goals is a powerful anti-depressant (Martell et al, 2010).

Health visitor feedback further encourages the mother to continue with behaviour that will eventually become naturally rewarding. This behavioural change intervention is now recommended by NICE Guidelines (Nice, 2014).

Conclusion

This article provides evidence to underpin the important contribution that health visitors are making. We suggest that whilst some of the core skills demonstrated by health visitors may be viewed as simple, they are often quite profound in their impact on the brain. The health visitor relationship feeds through in dramatic fashion from parents to the babies in their care. Research has shown, for example, that oxytocin levels are naturally raised and sustained by the helpful health visitor-mother relationship.

Trainee and novice health visitors have the advantage of preparation programmes that include reference to this important literature to underpin their practice learning. There may be scope, however, to review the knowledge and skill set of the existing health visiting workforce in order to identify gaps and offer appropriate development opportunities.

Key points

- 1 Neuroscience underpins many of the core skills of health visitors;
- 2 Collaborative relationships result in a reduced stress response;
- 3 Educational interventions can in themselves reduce self criticism and depression;
- 4 Goal setting can improve motivation and depression.

Key words

- 1 Neuroscience;
- 2 Health visitors;
- 3 Post natal depression;
- 4 Oxytocin;
- 5 Motivation.
- 6 Attachment

References

- Bandura A (1997) *Self-efficacy: The exercise of control*. New York, Freeman
- Beebe B, Steele M (2013) How does microanalysis of mother-infant communication inform maternal sensitivity and infant attachment?. *Attachment and human development*, 15 (5-6), 583 – 602.
- Beck AT, Rush J A, Shaw BF.(1979) *Cognitive Therapy of Depression*. New York: Guilford Press
- Beck JS (2011) *Cognitive Therapy: basics and beyond*. New York: Guilford Press
- Davidson RJ, Begley, S. (2013) *The Emotional Life of Your Brain: how to change the way you think, feel and live*. London, Hodder and Staunton.
- Department of Health (2011) *Educating health visitors for a transformed service*. London, Department of Health
- Fonagy P, Gergely G, Jurist, EL, Target, M (2002). *Affect regulation, mentalization and the development of the self*. New York, Other Press.
- French, D. P., Stevenson, A., & Michie, S. (2012). An intervention to increase walking requires both motivational and volitional components: A replication and extension. *Psychology, Health & Medicine*, 17(2), 127-9.
- Gilbert P, Choden (2013) *Mindful Compassion*. London, Robinson.
- Gottman JM, Katz I F and Hooven, C (1996) Parental meta-emotion philosophy and the emotional lives of families: Theoretical models and preliminary data. *Journal of Family Psychology*, 10 (3): 243 – 268.

Grant MM, Cannistraci C, Hollon SD, Gore J, Shelton R (2011) Childhood trauma history differentiates amygdala response to sad faces within MDD, *Journal of psychiatric research* 45(7): 886-895.

Hughes J, Baylis DA. (2012) *Brain-Based Parenting: the neuroscience of caregiving and healthy attachment*. London, Norton.

Kumsta R, Heinrichs, M. (2013) Oxytocin, stress and social behavior: Neurogenetics of the human oxytocin system. *Current Opinion in Neurobiology*, 23(1): 11-16.

- Kurth, E., Kennedy, H.P., Spichiger, E., Hösl, I. & Stutz, E.Z. 2011, "Crying babies, tired mothers: what do we know? A systematic review", *Midwifery*, vol. 27, no. 2, pp. 187-194.

LeDoux JE. 1996. The emotional brain. London, Weidenfeld Nicolson.

Martell CR, Dimidjian S, Herman-Dunn R. (2010). *Behavioural Activation for Depression: A Clinician's Guide*. New York, Guilford Press.

Meins E, Fernyhough C, Arnott B, Leekam, S, Turner, M (2011). Mother- versus infant-centered correlates of maternal mind-mindedness in the first year of life. *Infancy*, 16: 137-165.

Milne L, Greenway P, Guedeney A, Larroque B (2009) Long term developmental impact of social withdrawal in infants, *Infant Behavior and Development* 32(2): 159-166.

Moses-Kolko EL, et al (2011), Rapid Habituation of Ventral Striatal Response to Reward Receipt in Postpartum Depression, *Biological psychiatry* 70(4): 395-399.

Nice (2014) *Behaviour Change: Individual Approaches*. National Institute for Clinical Excellence.

Panksepp J, Biven L (2012) *The Archaeology of the Mind: Neuroevolutionary Origins of Human Emotions*. New York, Norton.

Poole H, Mason L, Osborn T (2006) Women's views of being screened for postnatal depression, *Community practitioner : the Journal of the Community Practitioners' and Health Visitors' Association* 79(11): 363.

Porges SW (2011) The Polyvagal theory: Neuro-physiological foundations of Emotions, Attachment, Communication, Self Regulation. New York, Norton.

O'Mahen H, Fedock G , Henshaw E, Himle J, Forman J, Flynn, H. (2012) Modifying CBT for perinatal depression: What do women want? A qualitative study. *Cognitive and Behavioral Practice*, 19(2): 359-371

Pierrehumbert B, Torrisi R, Ansermet F, Borghini A, Halfon, O. (2012) Adult attachment representations predict cortisol and oxytocin responses to stress. *Attachment & Human Development*, 14(5): 453-476.

Seigel, R.D. (2013) *The Developing Mind: how relationships and the brain interact to shape who we are*. New York, Guilford Press.

Smith M, Horne, M (2012) 'Health Visiting: Context and Public Health Practice ' in: KA Luker KA Orr J, McHugh GA, eds. *Health Visiting: A Rediscovery*. Chichester, John Wiley.

Strathearn L (2011) Maternal neglect: oxytocin, dopamine and the neurobiology of attachment", *Journal of neuroendocrinology* 23(11):1054-1065

Schore A. (2011) The right brain implicit self lies at the core of psychoanalysis. *Psychoanalytic Dialogues*, 21(1): 75-100

Simm R , Hastie L, Weymouth, E. (2011) Is training in solution-focused working useful to community matrons? *British Journal of Community Nursing*, 16, (12): 598 - 603

Smith, M, Horne, M. (2012) 'Health Visiting: Context and Public Health Practice ' in: KA Luker, J Orr, GA McHugh (eds.) *Health Visiting: A Rediscovery*. Chichester, John Wiley.

Sokol L E, Epperson C N, Barber J P. (2011). A meta-analysis of treatments for perinatal depression. *Clinical Psychology Review*, 31(5): 839-849.

Wallin DJ (2007) *Attachment in Psychotherapy*. New York, Guilford Press.

Whittaker K A, Cowley S. (2012). A survey of parental self-efficacy experiences: Maximising potential through health visiting and universal parenting support. *Journal of Clinical Nursing* 21(21-22): 3276-3286.

Wilkinson, M (2010) *Changing Minds in Therapy: Emotion, Attachment, Trauma and Neurobiology*. New York, Norton.

Williams C, Cantwell, R and Robertson, K. (2012) *Overcoming Post Natal Depression: A Five Areas Approach*. London, Hodder Arnold.

Whittaker K A, Cowley S. (2012). A survey of parental self-efficacy experiences: Maximising potential through health visiting and universal parenting support. *Journal of Clinical Nursing* 21(21-22): 3276-3286.

