

A children's nurse's role in the global development of a child with diabetes mellitus

Jodie Kenny and Doris Corkin discuss how nurses should work closely with children who have type 1 diabetes, and their parents, to increase understanding of the condition and improve care

Abstract

The nursing care of a six year old with type 1 diabetes reveals the importance of accurate control of the condition for normal physical, emotional and cognitive development. Clearly the children's nurse can educate and support the child, parents and extended family towards achieving independence and self-care. Theoretical knowledge of normal child maturation can guide nurses to constantly adapt their modes of communication and nursing skills, so as to promote every aspect and stage of the child's growth. Prevalence of type 1 diabetes is increasing, and nurses should use their close professional involvement with patients to assist research at every opportunity.

Keywords

Child development, children's nurses, type 1 diabetes

effective glycaemic control can support this and how he adjusted psychologically to his condition. The article aims to demonstrate integration of theory with practice, particularly to inform undergraduate students in the field of children's nursing.

Theories of child development

Consideration of the relevant theories reveals that child development is a complex, multifaceted process, which includes changes that begin at birth and continue throughout the lifespan of an individual. It is important that children's nurses understand how children and young people grow and how this can be disrupted by a chronic disease process.

Child development has been defined by Berk (2012) as a '...field devoted to understanding constancy and change from conception through to adolescence'. Theories are an integral part of our understanding, and the literature emphasises that nursing is a professional discipline in which theoretical knowledge is important for guiding practice (Smith and Liehr 2008). In particular, the 'nature versus nurture' debate has been a dominant issue in developmental science (Bee and Boyd 2010).

The dependence of a child's cognitive ability on age and developmental level can be to some extent explained by Piaget's four-stage theory as shown in Box 1 (Piaget 1930). The utility of this theory is illustrated in the case report section.

Diabetes mellitus

There are two main types of diabetes – type 1 and type 2. Type 1 is the most common endocrine disorder in children and may present at any age (Cardwell and Corkin 2012). The literature suggests that the

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APPROXIMATELY 29,000 children and young people are living with diabetes in the UK and prevalence of type 1 in children is one per 700-1,000. Primary care trusts can thus expect between 100 and 150 children with diabetes in their areas (Diabetes UK 2011/2012). Using relevant theories, this article explores the physical, social and cognitive development of a child with type 1 diabetes and discusses how effective glycaemic control is necessary for normal progress. A case study and personal experience suggest that caring for a child with type 1 diabetes can have a major impact on home and school life, even though often parents strive to create a sense of 'normality' for their child. The influence of nature versus nurture and the supportive role of the children's nurse are addressed.

This article presents a case study of a six-year-old boy with type 1 diabetes, who was first encountered when he attended an outpatient clinic with his family for review following a hypoglycaemic episode. Using relevant theories, the discussion aims to explore his physical and cognitive maturation, focusing on how

aetiology of type 1 diabetes is not clear, however genetic and environmental factors have been linked to its development (Nair 2007). As to the pathological mechanisms involved, type 1 diabetes has been found to result from a diminishing level of insulin production in the beta cells of the pancreas, whereas type 2 diabetes results from a relative lack of serum insulin secretion and insulin resistance (Morrow *et al* 2010).

Types 1 and type 2 diabetes lead to elevated blood glucose levels. However, the production of ketones in the urine is more likely in type 1. According to the charity Diabetes UK, young people with type 1 diabetes are more likely to die than their peers because they are not getting the health care they need. The charity has published a guide setting out ten essentials for every child with type 1 diabetes (Box 2) (Diabetes UK 2012)

The effects of high blood sugar (hyperglycaemia >15mmol/L), if uncontrolled, can be devastating leading to damage of the eyes, liver or kidneys (Cardwell and Corkin 2012).

Case study

To maintain confidentiality as outlined in the Nursing and Midwifery Council (NMC's) code of conduct (NMC 2008), the child's name in this example has been changed and is referred to as James. To use his case study, verbal informed consent was obtained from James's parents.

At six years of age, it is not dramatic changes that govern motor development but rather refinement of previously acquired skills. Moules and Ramsay (2008) said: 'As children grow and mature, so their bodies develop and they are able to perform more skilful and complex movements.'

On observing and interacting with James, the nursing student placed with him was able to identify that he was advancing in his gross and fine motor development, and was achieving the milestones considered acceptable for a boy of his age. For example, hand-eye co-ordination skills were evident as James had the ability to write neatly with a mature grip on his pen, and was able to complete a jigsaw puzzle. He also demonstrated integration of gross and fine motor skills in throwing a tennis ball, with particular attention paid to the fact that James had the ability to use one hand when executing the throw.

Having type 1 diabetes and attending school, he was likely to be presented with more challenges than other children in his growth, maturation and physical activities, because of the evolving requirements of managing hypoglycaemia. Therefore, the levels of his own, his parents' and his teachers' knowledge needed to be continually monitored and updated for interventions to be appropriately implemented and for James to maintain optimal glycaemic control.

Box 1 Piaget's four stages of cognitive development

Sensorimotor	Birth to two years
Pre-operational	Two to seven years
Concrete operational	Seven to 12 years
Formal operational	Twelve years to adulthood

Box 2 Ten essentials for every child and young person with type 1 diabetes

Care from a specialist team	The right care when you are in hospital
Regular checks	A smooth transition to adult services
The right treatment	A say in the care you get
Support so you can do it yourself	Support at school
Help with feelings or worries	Equal opportunities

(Diabetes UK 2012)

During discussions with James and his parents it became apparent that for four months his teachers lacked insight and vital information about his condition; this was evident when James's teachers checked his blood glucose levels 30 minutes after lunch as opposed to two hours after eating. Teachers who take on this responsibility will expect support in school from a diabetic nurse specialist (Box 2). This inevitably led to a temporarily high blood glucose reading, as the insulin injection that James had received before eating needed sufficient time to respond to the post-prandial rise in blood glucose and then effectively lower this level.

Therefore, with such a high reading, James was prevented from participating in any physical activity, although effective glycaemic control was, in fact, supporting his physical progress and he could participate in physical activities with his peers in school safely. Subsequently, James's parents specified that school teachers, school nurses, children's community nurses and staff should receive adequate diabetes training.

The National Service Framework for Diabetes identifies the standards of care set up in relation to children and young people with diabetes, with reference to specific care required to optimise their glycaemic control and physical, psychological, educational and social development (Department of Health 2001). This allowed for the formulation of a care plan individual to James, in collaboration with James himself, his parents and his teaching staff, and

referring to guidance on insulin adjustment to allow safe participation in physical activity (Royal College of Nursing (RCN) 2009, Cardwell and Corkin 2012). The nursing student recognised the importance of negotiation and collaboration between James and his family, nursing staff, teachers and relevant services to achieve continuity to minimise the effect of his condition on his global development. Also the nursing student acted as an advocate for him and his need to participate in physical activity, by informing all involved of the benefits of exercise; these include the reduced risk of volatile glycaemia and obesity as well as increased stamina, muscle strength and flexibility (Riddell and Perkins 2006). Guthrie *et al* (2003) also emphasised the importance of balancing glycaemic control with regular play activities, as playing with peers is fundamental for children's development.

Dietary intake is a major factor in long-term, effective glycaemic control, but over-aggressive handling of this issue needs to be avoided as early as possible to prevent non-concordance in adolescence (Sadik and Campbell 2001). The nursing student was mindful that the well-balanced diet James consumed might differ from that of a six-year-old who did not have type 1 diabetes. Furthermore, insulin routines had to be integrated into daily eating habits, as well as periods of physical activity, to provide for normal growth and development. Insulin administration had to be constantly flexible if it were to prove adequate in addressing James's changing needs.

James's parents had emphasised to the nursing student that the child's dietary intake involved three meals per day and three small snacks, and that they had been informed by the paediatric dietician that carbohydrate counting was not advisable in the circumstances. Although it was standard practice to educate families and young people around carbohydrate counting skills when on daily regimens of insulin or pump therapy, the need for this would require continuous individualised assessment.

Cognitive development In relation to James' cognitive development, even though he was most concordant with his diabetes management, it was important to continue to discuss it with him and involve James in his own care. Information had to be presented in a way he could understand, for example given gradually and in bite-size form.

According to Piaget's theory, James was in the pre-operational stage which occurs from the age of two to seven years and during which time there is an increase in mental representation through drawings, magical beliefs and the acquisition of mental reasoning (Glasper and Richardson 2006). At six years old, James would be deemed too young to fully understand and

self-manage his diabetes, and his parents explained to the nursing student that he could not inject himself as he was not able to grasp the concepts of insulin volumes and effective glycaemic control. However, to give James some control, with appropriate support and supervision he would be able to carry out his own injections over time. The main goals were to increase James's knowledge of the condition, promote his independence and concordance, and also improve his acceptance of a lifelong, chronic condition.

This can be related to the 'nature versus nurture' debate. Even though Piagetian concepts place more emphasis on nurture, the nursing student was able to see that James was accepting of his condition because his father also had type 1 diabetes, recognising his condition as innate (nature), as supported by Hockenberry and Wilson (2007). Chaney *et al* (1997) found that fathers had a greater influence than mothers on a child's acceptance of the condition, and this was evident from speaking with James's father. James understood that his diabetes management involved a similar routine of injections and monitoring of blood glucose and dietary intake (nurture).

This was reflected in James's behaviour when asked to check his teddy bear's blood glucose level. James took on the role of his father for the procedure, and teddy became James, and the boy was able to demonstrate skilfully how a blood glucose level is checked. Thus, it can be helpful if the children's nurses and the multidisciplinary team (paediatric consultant, dietitian and diabetic nurse specialist) are familiar with Piagetian concepts in delivering clear explanations of the condition and management to a child. However, information given to children should be attuned to their individual cognitive ability if they are to grasp and remember what they are taught.

Behaviour management Another aspect that affected James's cognitive development was how he behaved in relation to his diabetes management. His parents stated that they were finding it increasingly difficult to differentiate between the effects of the condition on the one hand and James's occasionally challenging conduct on the other. The nursing student observed the paediatrician and paediatric diabetes nurse specialist advising James's parents to be consistent when he was trying to manipulate the situation, by reiterating to him that 'no' meant 'no' and using diversion to avoid confrontation especially when his sibling was present and might be asking for the same thing, such as confectionery. His parents were able to identify the journey of adaptation from diagnosis through to promotion of self-management, and this helped ensure a tailored but consistent routine in maintaining appropriate glycaemic control (RCN 2009).

There is also a social implication within this domain: families with a child who has type 1 diabetes may feel isolated from other family members and from other parents, as these may fear that the child could become unwell when at a friend's house or in the care of an extended family member.

Supportive role of children's nurse

As a children's nurse one should recognise that it is vital to promote optimal development, acting as an advocate with the best interests of the child and family at heart to enable them to make informed decisions about the care they receive. Children may well be vulnerable, in need of specialist care and often fearful of what is happening to them.

Children's nurses can provide information and education using a holistic approach, considering all aspects of a child's progress, including social, physical, cognitive, emotional and educational abilities. Such an approach was incorporated in the interactions between James and the nursing student. By getting down on her knees the nursing student was able to speak to and support James, ensuring that eye contact was maintained at his level. In addition, recognition of the current stage of his cognitive development enabled adaptation of the language used so that it would be easy for him to understand. Play, used as a distraction tool while James's parents liaised with the paediatrician and paediatric diabetes nurse specialist, enabled the nursing student to further the therapeutic relationship with James and also assess his global development when playing games.

Diabetes can lead to serious long-term complications and possible death if not treated effectively (Diabetes UK 2011/2012). The National Institute for Health and Care Excellence (2004) issued

guidelines for best practice in diabetes care and support for children and young people. The children's nurse educates children and families and ensures they are recipients of and collaborators in optimal person-centred care, aimed at enhancing the child's global development.

Conclusion

Children's nurses have a fundamental responsibility to maintain their knowledge and competencies throughout their professional career, enhancing their contribution to child health.

Rising rates of diabetes and associated health problems have increased the need for responsive health services. All families will experience difficult days when caring for their child with type 1 diabetes and may have to adapt to a constrained lifestyle. Children's nurses are key participants when establishing a therapeutic relationship with children and their families; they play a pivotal role in the hospital and community settings, and should pursue any opportunities to assist and advance research in the field of child diabetes.

Although this article does not attempt to offer new approaches, it does highlight the importance of integration of theory with evidence-based practice to ensure high quality care. Many children with type 2 diabetes may not be aware that they have the condition, as this can go undiagnosed until adolescence, whereas children with type 1 diabetes generally manifest signs and symptoms very quickly, which leads to earlier diagnosis. Therefore it is imperative that children's nurses maintain and update their evidence-based knowledge and understanding of child development theories, so as to foster the best possible global development of children and young people with diabetes mellitus who are in their care.

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Conflict of interest
None declared

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