Current topic

Changes in understanding of illness as the child grows

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There is increasing evidence that inadequate and often inaccurate information about the body¹⁻³ and reasons for illness⁴ exists among adults. Pendleton and Hasler⁵ attribute the failure of much communication between doctor and patient to this lack of relevant information, characteristic of much of the population. If communications with adult patients are difficult, the problems with children are even greater. The uniqueness of the child's thought means that the paediatrician often has little insight into the child's perceptions and understanding of illness and its treatment; the child's thought processes often seeming bizarre and unpredictable to the adult. A sizeable body of research is now available, however, which suggests that the child's knowledge of the body and how it works, as well as knowledge about the causes and prevention of illness and treatment, develops in a systematic manner. The implications for the paediatrician are that awareness of this sequence may not only aid communication about illness and treatment to the child, but also lead to greater understanding of seemingly strange or uncooperative behaviour sometimes shown by paediatric patients. The purpose of this paper is to review briefly research on the development of the child's understanding of the body, illness, and treatment and discuss the potential relevance of this work for paediatric practice.

Understanding of the body

This work tends to be based on children's drawings of the insides of their bodies.⁶⁻⁷ In addition some researchers have asked children to explain the function of various body organs.⁸⁻¹⁰ Typically, it has been reported that the drawings of average pre-school children consist of food (that they put there), and bones (that they can feel), and blood (that they have seen if they have cut themselves). Between 5 and 7 years children draw a heart and brain but do not regularly include the stomach or lungs till about 10 years. Only during adolescence are children at all likely to draw organs such as the kidney, liver, or

those involved with reproduction. The child's knowledge of function is similarly unimpressive. Young children believe that any particular organ has one function only. Thus, 5 year olds believe that the heart is for loving, or the brain is for thinking. In an extensive study of children's knowledge of the functions of the brain,¹¹ it was reported that children from 6 years upwards thought the brain to be involved in mental acts. Knowledge of the brain's role in the senses or motor behaviour developed throughout childhood. Eiser and Patterson¹⁰ asked children to name body parts used in swimming. Six year olds acknowledged only the role of the arms and legs. Eight and 9 year olds were more likely to name, in addition, the lungs, but only 50% of 11 year olds named the brain.

It is evident that at least three stages exist in the development of the child's knowledge of the body. In the first stage (up to 7 years) children confuse internal and external aspects of the body; their knowledge of the existence and position of different organs is rudimentary, and their knowledge of function seems to lag behind knowledge of position. During the 7 to 11 year period there is some development in knowledge of a number of different organs, but the child does not tend to relate the various parts of the body together. Thus, knowledge and understanding of the different organs making up, for example, the digestive system is not usual till adolescence.

Understanding of the causes of illness

This research was pioneered by Bibace and Walsh¹²⁻¹³ who asked children from 4 to 12 years of age a series of questions about the causes of illness in general as well as more specific illnesses such as measles, cancer, and heart attacks. They were able to identify three stages in the child's thought. Between age 4 and 7 years children often attributed the cause of illness to magic or witchcraft. Other children in this age group believe that illness is a form of punishment. As Langford¹⁴ pointed out

long ago these beliefs should not necessarily surprise us. Adults often predict disaster if the child is naughty (for example persists in tree climbing or goes out without warm clothes). Small wonder that the child who subsequently falls and breaks an arm or gets a cold feels that illness is indeed the result of misdemeanour. Between 7 and 10 years the child becomes aware that illness can be 'caught' from another individual. At the least mature level of this stage, the child is likely to believe that illness is contracted by physically touching another person, object, or animal, and is also likely to overgeneralise this new knowledge. Thus, children are inclined to believe that non-contagious illnesses are also catching.¹⁵ It is not until adolescence that the child acknowledges any individual vulnerability to illness and realises that mere exposure to illness does not necessarily result in illness itself. At the same time, the adolescent becomes aware of psychological causes of illness—a causal relation between the presence of stress and illness developing about this time.

Knowledge of medical treatment

Children often misperceive the reasons for different medical procedures. Steward and Steward¹⁶ describe a boy who believed that the one aspect of treatment most likely to make him better was having his pulse taken. In that the effects of treatment are rarely immediate in alleviating pain, it is natural that children should be confused about various medical procedures. Almost without exception, it has been reported that very young children perceive treatment as punishment.^{17 18} In one of the most recent studies, Brewster¹⁹ interviewed chronically sick children aged between 5 and 13 years. All 5 and 6 year olds thought that treatment was punishment. Between 7 and 10 years children did become aware that the purpose of treatment was to make them better, but they regarded medical personnel negatively, believing that doctors were only aware of the painful nature of treatment if the child cried. Children over 10 years were more likely to accept the potential long term benefits of treatment. They were still inclined to believe that doctors could only be truly sympathetic about the pain if they had actually undergone the treatment themselves. Comparable findings were reported by Beales *et al*²⁰ who studied children with rheumatoid arthritis. Children aged between 6 and 11 years could not comprehend that treatment with immediate, unpleasant effects could possibly make them better. Thus, 'nasty tasting' medicine, in having an immediate negative effect could not make them better. In contrast, 'nice tasting' medicine, in being associated with an

immediately pleasurable experience, could lead to an improvement in health. Neither could these children understand that tablets which are swallowed and entered the stomach could possibly benefit painful joints in other parts of the body. It is apparent from all this work that any long term benefits of treatment are only acknowledged by children of 11 years or more. Children below this age have difficulty understanding the role of treatment, and unfortunately often subscribe to the view that doctors deliberately hurt and upset them.

Implications

Despite the fact that much of this work has the professed goal of improving communication with sick children, it would be wrong to suggest that many definitive conclusions can as yet be drawn. Much of the work reviewed has been based on healthy children's knowledge of the body or causes of illness. It is not necessarily the case that the beliefs of sick children mirror those of the healthy. In his work on general cognitive development, Piaget²¹ maintained that knowledge of any concept was dependent on an individual's degree of experience, and this hypothesis might lead us to expect that sick children would have a more mature understanding of illness-related concepts than their healthy peers. The little empirical work that there is suggests the reverse; sick children are more likely to show immature reasoning about illness.^{22 23} Eiser, Patterson, and Tripp²⁴ compared knowledge of the body and illness among a group of children with diabetes and an age matched control group. There were few differences between the groups in the level of their reasoning. The authors felt, however, that more detailed work controlling for variables such as the age of the child, length of time the child had been ill, and characteristics of the illness were called for.

Despite these reservations, the work reviewed has been taken as sufficient grounds for recommendations about the type of information that may be most suitable for sick children of different ages. While it is clear that simple medical explanations are only really suitable for the adolescent patient, the question of how to convey details of illness and treatment to younger children remains pertinent. Bibace and Walsh¹² suggested that information to children under 7 years of age should be limited to perceptual aspects of hospital, including, for example, descriptions of equipment, distinctions between uniforms of nursing staff, etc.

The bulk of the work has, however, been directed at the issue of communicating with the sick 7 to 10 year olds. It has been argued that illness is best

explained to this group by relating the information to everyday aspects of the child's experiences. Whitt, Dykstra, and Taylor²⁵ give several examples. These authors suggest, for example, that epilepsy can be explained by likening the brain to a telephone system and a fit to a crossed wire or wrong number. Similarly, diabetes can be explained by likening the body to a car, and equating food requirements to the fuel intake of the car.

In an attempt to investigate how well children understand this type of information, Potter and Roberts²⁶ read short descriptions of a sick child to healthy 8 and 11 year olds. In one condition, the illness was described in simple medical terms: in a second condition, the illness was described in terms of the metaphors outlined above. While the child's understanding of the illness was enhanced in the metaphor condition, liking for the sick children was reduced. Such results suggest that simply increasing the child's knowledge of illness may not be associated with entirely positive consequences.

Research in this area continues in several directions. Further basic research detailing the processes whereby children gain knowledge of their bodies and health and illness related concepts is still necessary. The sources of information about these topics available to the child, and any differences in the availability of different sources in relation to demographic variables is an important next step. The methodological techniques developed in this research can also be applied to studying how children gain knowledge of harmful health behaviours such as smoking. Meltzer, Bibace, and Walsh²⁷ have shown that age related differences exist in children's beliefs about the consequences of smoking, and regard these findings as vital in ensuring that health education about smoking is appropriate for the child, rather than determined by adult beliefs.

The very poor knowledge often shown by children with regard to these concepts raises the question of whether this results from a cognitive immaturity preventing further understanding, or whether this is due to insufficient and inadequate teaching at home or school. Any large scale investigation of this question has not been attempted. Some research with children with diabetes suggests, however, that the problem may lie largely with the child's cognitive immaturity. Harkavy *et al*²⁸ assessed children before and after attending summer camp, and concluded that while appreciable gains in knowledge were made among 12 to 15 year olds, no gains were made by 10 to 12 year olds. Johnson *et al*²⁹ also concluded that some aspects of illness and treatment simply cannot be explained to children. These authors suggest, for example, that children under 12 years

are unable to relate results of urine or blood tests with the complexities of insulin requirements, and that it is generally a futile exercise to attempt to teach them in this way. Instead, they have argued that teaching about diabetes should be limited to information about diet for 6 year olds, and to information about urine testing for 9 year olds. No attempt should be made to teach these children about the implications of test results for insulin requirements.

The purpose of this paper has not been, however, to defend rigorously specific suggestions such as these. Rather it has been to bring to the notice of paediatricians a growing body of published reports that may well be relevant to practical difficulties which often arise in the care of sick children. Closer liaison between psychologists and paediatricians may lead to greater understanding of how children's inaccurate or plainly incorrect beliefs about hospitals and treatment arise.

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References

- Boyle CM. Differences between doctor's and patient's interpretations of some common medical terms. *Br Med J* 1970;ii: 286.
- Blum LH. Health information via mass media: study of the individual's concepts of the body and its parts. *Psychol Rep* 1977;40:991.
- Pearson J, Dudley HAF. Bodily perceptions in surgical patients. *Br Med J* 1982;284:1545.
- Elder RG. Social class and long explanations of etiology of arthritis. *J Health Soc Behav* 1973;14:28.
- Pendleton D, Hasler J, eds. *Doctor-patient communication*. London: Academic Press, 1983.
- Tait CD, Ascher RC. Inside-of-the-body test. *Psychosom Med* 1955;17:139.
- Porter C. Grade school children's perceptions of their internal body parts. *Nurs Res* 1974;23:384.
- Gellert E. Children's conceptions of the content and functions of the human body. *Genet Psychol Monogr* 1962;65:293.
- Crider C. Children's concepts of the body interior. In: Bibace R, Walsh ME, eds. *New directions for child development: children's conceptions of health, illness and bodily functions*. San Francisco: Jossey-Bass, 1981.
- Eiser C, Patterson D. Slugs and snails and puppy dog tails: children's ideas about the inside of their bodies. *Child Care Health Dev* 1983;9:233.
- Johnson CN, Wellman HM. Children's developing conceptions of the mind and brain. *Child Dev* 1982;53:222.
- Bibace R, Walsh ME. Development of children's concepts of illness. *Pediatrics* 1980;66:913.
- Bibace R, Walsh ME. Children's conceptions of illness. In: Bibace R, Walsh ME, eds. *New directions for child development* vol 14. San Francisco: Jossey-Bass, 1981.
- Langford WF. Physical illness and convalescence: their meaning to the child. *Pediatrics* 1948;33:242.
- Kister MC, Patterson CJ. Children's perceptions of the causes of illness: understanding of contagion and use of immanent justice. *Child Dev* 1980;51:839.
- Steward MS, Steward DS. Children's conceptions of medical procedures. In: Bibace R, Walsh ME, eds. *New directions for*

- child development: children's conceptions of health, illness and bodily functions*. San Francisco: Jossey-Bass, 1981.
- ¹⁷ Eissler RS, Kriss M, Solnitt AJ. *Physical illness and handicap in childhood*. New Haven: Yale University Press, 1977.
 - ¹⁸ Peters BM. School-aged children's beliefs about causality of illness: a review of the literature. *Matern Child Nurs J* 1978;**7**:143.
 - ¹⁹ Brewster AB. Chronically ill hospitalized children's concepts of their illness. *Pediatrics* 1982;**69**:355.
 - ²⁰ Beales JG, Holt PLJ, Keen JH, Mellor VP. Children with juvenile chronic arthritis: their beliefs about their illness and therapy. *Ann Rheum Dis* 1983;**42**:481.
 - ²¹ Piaget J. *The child's conceptions of physical causality*. London: Kegan-Paul, 1930.
 - ²² Simeonsson R, Buckley L, Monson L. Conceptions of illness causality in hospitalized child. *J Pediatr Psychol* 1979;**4**:77.
 - ²³ Caradang M, Folkins CH, Hines PA, Steward MS. The role of cognitive level and sibling illness. *Am J Orthopsychiatry* 1979;**49**:747.
 - ²⁴ Eiser C, Patterson D, Tripp JH. Diabetes and developing knowledge of the body. *Arch Dis Child* 1984;**59**:167.
 - ²⁵ Whitt JK, Dykstra W, Taylor CA. Children's conceptions of illness and cognitive development: implications for pediatric practitioners. *Clin Pediatr* 1979;**18**:327.
 - ²⁶ Potter PL, Roberts MC. Children's perceptions of chronic illness: the roles of disease symptoms, cognitive development and information. *J Pediatr Psychol* 1984;**9**:13.
 - ²⁷ Meltzer J, Bibace R, Walsh ME. Children's conceptions of smoking. *J Pediatr Psychol* 1984;**9**:41.
 - ²⁸ Harkavy J, Johnson SB, Silverstein J, Spillar R, McCallum M, Rosenbloom A. Who learns what at diabetes summer camp? *J Pediatr Psychol* 1983;**8**:143.
 - ²⁹ Johnson SB, Pollak T, Silverstein JH, *et al*. Cognitive and behavioral knowledge about insulin dependent diabetes among children and parents. *Pediatrics* 1982;**69**:708.

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