What do 11-year-olds know about heart disease?

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The writer suggests that teachers may not be taking sufficient notice of the health-related knowledge or beliefs that children bring into the classroom. Twelve interview studies with 154 pupils confirmed his view that these could be substantial. What may be lacking, however, is the ability to find links between these packages of information. 'I would contend that it is these links which shape behaviour, and that this is the area that we as educators should be looking at carefully.'

The investigation was carried out during the 1985 autumn term as part of a study to investigate children's perceptions of health education and the factors that contribute to their awareness, knowledge, beliefs, and attitudes. I was interested in the study completed by Shirley Prendergast and Alan Prout (1) which looked at the knowledge of 15- and 18-year-old pupils in four health areas. This large-scale study showed that adolescents possess a significant body of knowledge, much of which schools seem to ignore in their health education courses. I decided to find out if a similar situation existed with children in their first year at secondary school and at the same time to explore their attitudes and beliefs.

It seemed sensible, because of the short time available, to choose one area of health; and I felt that heart disease would be appropriate, since it had recently received publicity as the largest killer in Britain. It also provided the opportunity to talk about several other major health factors, namely smoking, stress, obesity, diet, and exercise.

Organising the study

The study was based on a series of semi-structured interviews with groups of 11-year old pupils in Cambridgeshire secondary schools. I decided that the interviews would need a focus and for this reason I put together a four-minute videotape, which included snippets of advertisements, drama, and sports activities. I included some reference to all the factors thought at present to cause heart disease, (diet, exercise, stress, and obesity). Reference to these factors was not always obvious, and sometimes more than one was suggested at the same time – for example an obese runner completing the London marathon.

I asked the teachers of the children concerned not to prepare them in any way, except to say that a visitor was coming who wanted to talk with them. The interviews were carried out in normal scheduled science lessons, wherever possible with no other adults present. I chose to interview groups rather than individuals because I wanted my work to be of obvious relevance to the teacher in the

classroom and I hoped that my findings might influence their approach in the future.

In all, 12 interviews were completed. The total sample was 154 children (70 boys and 84 girls): the average group size of 12.8 represents about half a normal sized science class at this level. One of the interviews was with a group who hadn't seen the videotape, and another with a group of children in a special school. These gave me the opportunity to consider two factors affecting the investigation: firstly, whether it was the video which provided the information; and secondly, whether the response from very low achievers was significantly different from that of pupils in mainstream schools.

Knowledge levels

I was surprised initially by the amount of accurate knowledge that the children possessed. It was interesting to see that the dynamics of the group interview stimulated them to express their ideas freely without fear of mistakes. They occasionally asked questions of me but for most of the time they talked freely and shared their views and feelings.

Children at this age seem to have a reasonable knowledge about the structure and function of the body, and this knowledge was similar among all groups irrespective of their ability. The knowledge was characterised by being in fairly isolated 'packages', with links between them being very vague or non-existent.

The results suggest that 11-year-olds are aware of the basics of respiration and digestion in terms of the organs involved and their working. They know that the bloodstream carries materials around the body within blood vessels, and that the heart is the pump which moves the blood; they know that the pulse rate is the same as the heart rate and that this varies depending on what we are doing; they also know that physical activity leads to an increase in our heart rate as more blood is required to be moved. They see the brain as the control organ of the body.

However, they are unable to link the different parts, although they know that they interact. On several occasions children tried to explain links, often with considerable determination in the face of scepticism from their fellow pupils. Although they were not always successful, I was surprised how easily some children were convinced by their classmates as to the feasibility of a possible explanation.

Some suggested risk factors

Smoking All the groups named smoking as a cause of heart disease. It was often the first factor mentioned, which probably reflects recent publicity and advertising. The children talked quite freely about tar and nicotine and saw these as the causative agents. In general they were unable to give an accurate explanation as to how substances went from the lungs to other parts of the body and so cause heart disease. Many children attempted an explanation, which usually involved the bloodstream, but all of them were different and inaccurate.

Exercise All the groups linked exercise with heart disease, and they seemed to reflect accurately current medical opinion – for example, that sudden violent exercise is dangerous while planned exercise programmes can be helpful. They felt that a sudden burst of activity could strain the heart and produce a heart attack, whereas gradual exercise could 'give the body time to adjust' and so be beneficial. They were also aware of the dangers of exercising when overweight, as this placed extra strain on the heart.

Stress All but three groups mentioned stress as a factor which caused heart disease, although the terminology varied considerably. The children were easily able to recognise people who were stressed, 'worked up' or 'all het up', and it quickly became obvious that they all had a personal experience of people in this state. Generally the children were able to explain that in this condition the heart beats faster and the sufferer may have a heart attack. Being frightened was linked to this.

Diet The relationship between our diet and heart disease is probably the area that has been the subject of most publicity in recent months, and so I was interested to see how much the children knew. I very quickly realised that the 1983 NACNE report guidelines of less salt, less fat, and less sugar (2) seemed to be common knowledge to nearly all the groups. Only three of the interviews did not produce all three clear messages. However, although the children seemed aware that too much salt in the diet can cause high blood pressure, which in turn can lead to heart disease, no one gave a feasible explanation as to why this might happen.

The relationship between high fat levels and heart disease was perhaps the best understood of the factors discussed. Children were, in general, able to explain quite accurately that the fat from food went into the bloodstream and then blocked the blood vessels, which restricted the blood flow and caused heart disease. The vocabulary used included terms such as *veins, arteries* and *cholesterol.* Foods which were high in fat were named easily by the children; and although several groups recognised the fact that there were different types of fat, the significance of this was not explained, except on one occasion when a child thought that animal fats were the most dangerous.

In general, the children seemed to have a good knowledge of healthy eating habits in terms of balanced meals and moderation, and approval for healthy eating. On several occasions, children made a case for small quantities of any food not being harmful.

Factors beyond control Several groups were aware that the risks of heart disease increase with age and felt that the ageing process in itself was a factor – 'the heart wears out'. Half of the groups interviewed also felt that heredity and birth defects were significant factors over which we had no control.

It was interesting to hear that some children see drug addicts as having no control over their behaviour, even if this behaviour leads to disease or death.

Beliefs and attitudes

Whenever possible, children related their health knowledge to personal experiences; it was this combination which governed their health-related behaviour. Their attitudes to health often seemed to hinge around one statement from a close relative, or a short piece of a television programme. They also recollected knowledge gained from people who had suffered from diseases or who had worked with sick people.

It was clear to me that attitudes to health, together with beliefs and feelings, are very powerful forces and are the result of many individual factors. Children are very reluctant to change these, but if we, as teachers, are hoping to alter their health-related behaviour, then we must consider how to get the children to modify these powerful forces. It has become increasingly clear that a purely factual 'knowledge' approach to health education is not sufficiently convincing to bring about this modification.

Implications for teachers

The relevant knowledge that children are able to bring a health education lesson would seem to exist in fairly discreet packages, with no firm established links between them. I would contend that *it is these links which shape behaviour,* and that this is the area that we as educators should be looking at carefully.

It is interesting to compare these ideas with other work which looks at approaches to learning in science. The Secondary Science Curriculum Review (1984) produced a series of papers which considered different views of learning. They suggest that the traditional view, which sees the learner as passive and receptive, is not effective in many areas. They then explore the constructivist view which is currently being investigated by the Children's Learning in Science Project (CLIS). This proposes that learning is an active constructive process by which we attempt to make sense of the world. From a young age, children construct meanings for events and observations; therefore they come to lessons with knowledge, ideas, and beliefs

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which may or may not be different from those of the teacher. It is suggested that children then use their existing knowledge to make sense of what happens in the classroom, and that this existing knowledge influences their interpretations and conclusions.

This seems to describe quite clearly the position of the children that I interviewed, as they all brought a great deal of knowledge to the lesson, and individual interpretations of the same information were often quite different. This would indeed be the case if each child measured the new information in terms of his or her own construct, rather than against criteria laid down by the school or the teacher.

The holistic model of health education and the use of problem-solving methods in science would also seem to be to accept to some degree a constructive view of learning, and would point towards consideration of the suggestions made by Driver and Erickson (3). They felt pupils should be provided with opportunities to

1. **Clarify their own meanings of situations.**
2. **Share their own personal meanings with other pupils.**
3. **Have their alternative ideas challenged in a non-threatening way.**

This implies more time for students to

4. **Reflect on their own thinking.**
5. **Share their ideas with other pupils so as to compare and contrast them.**
6. **Reconstruct their own ideas.**
7. **Gain confidence in using their ideas.**

It also implies a change in teaching strategy to allow for some (but not necessarily all) of the classroom time for

8. **Pupil-pupil talk about ideas and explanations.**
9. **Individual thinking time.**
10. **The careful selection of tasks to provide a framework against which pupils can test their ideas and beliefs.**

At first glance, this would seem to be such a major change that most teachers of science would shy away from it. I believe that science teachers are quite well equipped to cope with many of these and similar suggestions: perhaps more so than they imagine! They are, for example, used to setting classroom tasks (practicals) and organising group work, and so providing opportunity for pupil-pupil talk. However, teachers will have to learn new skills, as well as refining the ones that they are already using: the skills of promoting group discussion, listening to and valuing what children have to say, and using the knowledge that the child brings to the lesson to promote new learning.

References

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