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SciVerse ScienceDirect

Procedia Engineering 15 (2011) 5400 – 5404

Procedia Engineering

www.elsevier.com/locate/procedia

Advanced in Control Engineering and Information Science

Study on the application of Interaction Design to Children's Medical products

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Abstract

On the basis of the analysis of children's psychological reaction to medical products, the application of interaction design into children medical products, can not only afford an easy application of medical products, but also enhance the working efficiency of the medical staff, because children, in a way of game, are ready to accept the examination and treatment, hence the necessity of the application of the interaction design into children medical products.

Keywords: Interaction design, Design of children medical products, Psychological features of children, User-friendliness.

In the modern society, the health of children, one of social minority group, has ever been the foundation of their development, as well as become a social major problem. The regular children-oriented medical examination has received ever increasing attention. To ensure the accuracy of the examination, children are expected to be in a peaceful condition, but more often than not, because of their disease, changed environment and the fear to the medical instrument, children are more likely to react timidly, obstinately and even refuse and revolt the examination. In view of this situation, the former application of tranquilizer and hypnotic drug has been replaced by the application of psychotherapy since December 1997 to remove children's psychological barriers[1]. However, the application of drugs will do harm to the children and the psychotherapy, though can relieve children's unhealthy reaction to some extent, can, by no means, remove their psychological barriers radically.

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doi:10.1016/j.proeng.2011.08.1001

Through coordination of the relationship among children, medical instruments and the environment, interaction design can help them coexist harmoniously. In view of the four basic factors during children's psychological development, namely, the physical maturity, individual reaction to and acquisition of the practice, social experience, and self- adjustment [2], the interaction design has been applied into the children medical products to guide the children to accept treatment in a recreational way, realizing optimized coexistence between children and instruments, hence a more user-friendliness of the design of children medical products.

1. Interaction design

1.1 Concept

Ever since early 1980s, interaction design, as a new discipline concerning Human-Computer Interaction, has been firstly proposed by Bill.Moggridge, one of the founders of the US IDEO Corporation, whose initial name was "Soft Face" and later was changed into "Interaction Design" [3].As a part of ergonomics, interaction design also conducts studies on human's anatomy, psychology, physiology, etc, in some working conditions; on the interaction among human , computer, and the environment; on the way of balancing working efficiency, health condition, security and comfort among work, family and recreation[4]. Interaction design aims at establishing a healthy interactive relation between the user and the product so as to satisfy users' demand through designing products of clear contact surface and easy operation.

1.2 Development of the ID

The study on interaction design has been carried out as early as in 1960s when it appeared in a way of Human-Computer Interaction(HCI). Now, interaction design has gained great development and the application of it has been more and more popular in people's daily life, for example, the interactive interface operation of iPad; urban bicycle rental system; ATM, etc.

As a scientific approach to studying the interaction between the artificial ware or system and the user or participant, interaction design has created a perfect interactive effect for the artifact auditorally and visually, both in the form of hardware and software, thus providing a perfect service for the user. In applying the interaction design, there abound problems to be considered, for instance, how to adopt interactive approach to remove strangeness between the product and its users[5]; how to adopt a simple and easy way to remove the frustration caused by the complexity of the product; how to enhance working efficiency meanwhile ensuring products' safety; how to make users to accept the products more easily from the aspects of products' color, material and design; how to better reflect products' performance, etc.

2. User-friendliness of interaction design in children medical products

The application of interaction design into children medical products is, under the prerequisite of product safety, to establish a friendly and organic interaction between products and their users, so as to give a full expression to the function, safety and recreation of children medical products. Before medical examination and treatment, medical staff shall seek out a simple operation to achieve a quick and effective examination and medical treatment, which can allow children to accept treatment happily and healthily. The designer, while designing children medical products based on the product safety in the way of interaction design, can give a full play to child's psychological and behavioral advantages and make children more ready and happy to accept examination and treatment so as to avoid further harm, which fully embodies the user-friendliness of interaction design.

2.1 Factors influencing child's psychology by children medical products

Children medical products are designed to reach harmony and convenience during the whole process and eliminate child's inner obstacles. The product's functions, designs, colors, materials, sounds, etc, all will exert an influence on the child's psychology and behavior to different degrees. In terms of function, task should be divided appropriately between human and computer to avoid mal-operation. Even if mal-operation does occur, it should ensure the safety of both the children and the medical staff. In terms of the feedback of the product, it is expected to be quick and sensitive. In terms of the design, children medical products should be simply designed to benefit children's cognition, ensure their safety and relieve their tension. In terms of colors, simple and terse color dubbed with a few bright one can create a sense of calmness for children and at the same time avoid monotony of products' color. Besides, distinguishing working area by color can enhance both the accuracy of the operation and the cognition of children. In terms of materials, refined and soft material can reconcile the contrast between the sense of science and technology and humanization, facilitating a more friendly and cooperative treatment for children. In terms of sound, it is adjusted through three-dimensional sense to relieve child's tension. The child scanner(see Fig.1) , whose simple appearance decorated with large-area neutral shade was set off by the black symbol, can relax the patient to a greater extent. At the same time, the use of circular makes the product softer, and the refined material enhance the precision of the product.

Fig.1 Philips Kitten Scan

2.2 The application of interaction design into children medical products

From child's psychological and behavioral perspectives, by means of games or toys, the interaction design can make full use of child's vivacity and curiosity so as to let children happily accept and cooperate with the medical examination and treatment.

Fig2. Philips Kitten Scan

2.2.1 Game-oriented children medical products

Nowadays, treatment by means of games has become an important way of treating the child-patient, as it is beyond children's ability to fully express their emotion but games can provide a best access to child's inner world. Meanwhile, game is one of the best ways for child's physical and psychological development, which can help children better understand the world and themselves.

The design of children medical treatment combined with games can not only let the children happily accept the treatment, but also make good use of child's curiosity and hands-on ability to get them know better about themselves and acquire more. The Philips Kitten Scan (see Fig.2) imitates a real scan situation, through which children can put a doll embedded a RFIO on the platform and then push the platform into the CT Scan when the screen can read relevant information of the "patient". This treatment, which involves children in the treatment through games, can greatly relax children[6].

2.2.2 Toy-oriented children medical products

Toys, as the medium connecting children and games, serve as playmates in child's daily life.

The combination of toys and children can relieve child's psychological tension. Adopting medical examination chip to child's toys can conduct relevant examination for the children when they are playing with these toys and then transfer this information to doctor's computer. Syrinx Syringe (see Fig.3), covered with an animated cartoon, relieves the child from tension[7].

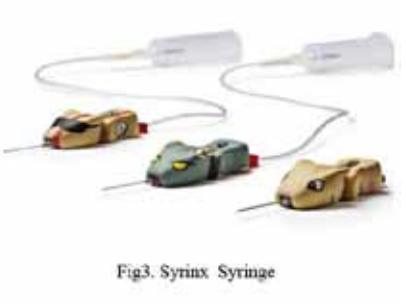

Fig3. Syrinx Syringe

2.2.3Other children medical products

Children of different ages will differ in psychological condition.

Infants are more likely to be dependent on others and can not manage themselves. As far as the infants are concerned, the design of the medical products should take into consideration the polytropism of child's emotion, and adopt a quick approach to examine the patient, for instance, Omron's MC-510 Ears in a thermometer can read the body temperature in one second.

Emotional experience dominates in children aged from 1 to 3, and personality shapes mainly in children of pre-school age. Children of school age begin to acquire the comprehension and analytical ability as well as the ability to control their emotion. As children of these three age periods have an acquaintance with the medical health, the design of medical products should pay more attention to child's senses, making the medical products become friends who can communicate with the patient. Foozi's Children Infusion System (see Fig. 4) is designed to hang TALISAC and child's pictorial and newspaper above and can deposit child's toys below and at the same time, the design of its wheels can facilitate movement during the infusion[8].

Fig4. Foozi children infusion system

The advantages of interaction design shall be put into full play while designing children medical products to guide the children to get familiar with the performance of medical products so that the children can gain a further understanding of the medical insurance and involve themselves in their own health condition.

3 Conclusion

Children medical products, centered around the children, are designed to make the children readily accept and cooperate with the medical examination and treatment. The introduction of interaction design will transform the tradition which aims only at the medical result. Through interaction between doctors and children, interaction design can put the performance of the medical products into full play, realizing harmony between medical products and child's psychological behavior.

The application of interaction design into children medical products will not only make the products more user friendly but also give a full expression to the great concern over the children by the whole society, which mirrors the social progress.

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Picture 3: http://www.billwang.net/html/2010/20834.html
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