Study of Cervical Spine Disease Prevention and Persuasion Strategies in a Younger Population

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Abstract: In this paper, to address the phenomenon of high incidence of cervical spondylosis among the younger group, the persuasive strategy for cervical spondylosis prevention among the younger group is studied based on persuasive design. According to the characteristics of the young group under the phenomenon of rejuvenation of health care, the corresponding persuasion strategy for cervical spondylosis prevention is proposed according to the three parts of behavioral motivation, behavioral ability and trigger mechanism, and the persuasion strategy is used to guide the design practice and industrial design practice to help the young group to improve the awareness of cervical spondylosis prevention, help users to develop good neck habits and reduce the high incidence of cervical spondylosis in the young group.

1 INTRODUCTION

Cervical spondylosis, as a degenerative lesion of the cervical spine, often causes symptoms such as neck and shoulder pain, upper limb numbness, and even tetraplegia in severe cases, bringing serious economic and mental burdens to patients and their families. Nowadays, about one tenth of people in the country suffer from cervical spondylosis, one third of young and middle-aged people have mild or severe cervical spondylosis, and more and more young people are joining the ranks of cervical spondylosis, with the growth rate increasing year by year. Through the study of domestic and foreign literature, in the prevention of cervical spondylosis, more research is conducted from medical massage and conservation, and very little is done to guide the prevention from the perspective of industrial design and product design.

Persuasive design is a design theory that uses persuasive techniques in design to change user behavior or attitude, and the theory is widely used in the change of poor human lifestyle and behavior. A reasonable and effective persuasion strategy can guide more young people to develop good neck habits and get rid of cervical spondylosis.

2 PERSUASIVE DESIGN AND THEORY

Persuasive design was proposed by Professor Fogg in the 1880s, and has been widely used in different fields as the theory has been enriched. Professor Fogg proposed and set up the model of user behavior: FBM (Fogg Behavior Model), which is used to gain insight into human behavior. The model divides the elements of behavior generation into sufficient motivation, sufficient ability to act, and effective triggers, one of which is indispensable.

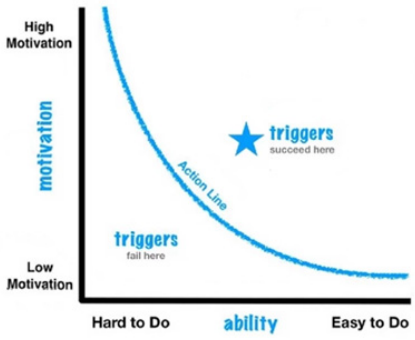

Figure 1: FBM behavior model diagram.

In the FBM behavior model diagram, the horizontal coordinate is ability, the vertical

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coordinate is motivation, and the curve represents the behavior curve. Above the curve and the curve is the behavior success zone, which indicates that the target behavior will occur; below the curve is the behavior failure zone, in which the trigger behavior fails and no behavior will occur. The target behavior will occur only if motivation, ability and trigger factors are available and appropriate at the same time.

3 CHARACTERISTICS OF THE YOUNG GROUP UNDER THE WAVE OF HEALTH AND WELLNESS

With the changes in the way society works, lives and communicates for entertainment, health and wellness are gradually penetrating into people's daily lives. For the young group, the change in lifestyle under the wave of health and wellness has led to a change in the behavior and psychological characteristics of the young group.

Table 1: Analysis of psychological characteristics of the younger group.

Behavioral characteristics	Punk health	The young group, while working hard and staying up late to consume themselves, also use the punk health care method to find a trace of health comfort amidst the pressure of work and life.
	Consumption-based life saving	Faced with the pressure of life and work, young people start various health activities and buy health products to improve their illusory sense of health through consumption.
Psychological characteristics	Health anxiety	Modern young people work under high pressure and live a fast-paced life, and generally possess health anxiety, feeling easily tired and weak, etc.
	Admiration for modern medical science	Modern young people are generally well educated and have a high admiration for the power of modern medical science.
Psychological characteristics	Willingness to try new things	Modern young people are energetic, curious, and willing to do whatever they want to do, and are willing to try and dare to try new products.

4 ANALYSIS OF PERSUASION STRATEGY FOR PREVENTION OF CERVICAL SPONDYLOSIS IN YOUNGER AGE GROUPS

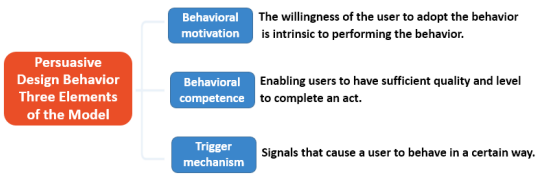

Figure 2: FBM behavior model diagram.

Long-term ambulatory work keeps the neck at rest for a long time, which is a long-term fixed unconscious behavior that can be easily ignored. Therefore, in order to make users complete the target behavior of prevention, we need to analyze the behavioral motivation, behavioral ability and triggering mechanism of the target behavior, and guide the user's attitude or behavior through design, so that it can be integrated into the life in a flexible and non-compulsory way to play a role and cultivate good behavioral habits of users.

4.1 Analysis of Behavioral Motivation

After the young group realizes the damage of incorrect neck habits to themselves, they will realize the importance of neck health and will increase their concern about cervical spine problems. We can make use of the anxiety and sense of urgency of the young

group about their own health to enhance the motivation of users to complete the target behavior, and make use of the high admiration for medical science and authority to make users motivated to complete the target behavior and promote the generation of continuous target behavior, so as to achieve the purpose of developing good neck habits.

4.2 Analysis of Behavioral Capabilities

Time, venue, and equipment are the most frequent obstacles encountered by younger groups in the process of performing cervical spondylosis prevention. To improve the user's behavior in the process of cervical spondylosis prevention and increase the user's sense of control in completing the target behavior, and at the same time to choose the exercise that makes the user exercise without burden and makes the operation process simple and saves the behavior time, we can start from the user's familiar behavior habits to help the user accept and complete the target behavior quickly.

4.3 Analysis of the Trigger Mechanism

The bad use habits of the young group's neck have become unconscious inertia behavior, under the previous behavior habits, the target behavior is easily in a state of forgetfulness, timely and effective reminders or feedback and other trigger mechanisms can help users correct the current incorrect use of the neck in a timely manner and effectively prevent the onset of cervical spondylosis.

5 CONSTRUCTION OF PERSUASION STRATEGY FOR PREVENTION OF CERVICAL SPONDYLOSIS IN THE YOUNGER GROUP

With the emergence of new things, the psychological characteristics and behavioral characteristics of modern young people under the wave of health care rejuvenation are also quietly changing. Based on the analysis of the characteristics of young people nowadays, the user's behavior is divided into three segments: before the target behavior, during the target behavior and after the target behavior, and the "three segments and six steps" persuasion strategy shown in Figure 3 is constructed to promote the occurrence of the user's cervical spondylosis prevention behavior.

5.1 The First Segment before the Target Behavior Occurs

Urgency People will avoid exercise as much as possible and find ways to be lazy. The sense of urgency is more likely to increase the target users' commitment to the target behavior and enhance the motivation to take action. For the young group, recognizing the danger of cervical spondylosis will make it easier to generate concern for their own health and a sense of urgency to improve the current situation, thus increasing the user's motivation to complete the target behavior.

Trust Trust can make people give fuller play to their subjective initiative, and the driving force to make the target behavior happen is to believe that their behavior has an effect and that their efforts will be rewarded. Younger groups are more likely to trigger the occurrence of continuous goal behavior when they have trust in the effects they get after performing the target behavior.

5.2 The Second Segment Target Behavior Occurs in the Middle

Familiarity. Improving ability and increasing skills cannot be achieved in the short term. Using users' familiar behavior habits to help them change their behavior is more easily accepted by users. Bad neck habits are unconscious behaviors of users. It is easier to improve the acceptance of young users to prevent cervical spondylosis by starting from the familiar behavioral habits of young groups.

Control. Users have a higher sense of "control" when using products or completing tasks, which will make users' attitude more positive and secure. Young people are more willing to be in control, to have control over their own behavior and subsequent development, and to choose the behavior pattern that suits them, so that young people can better accomplish the target behavior.

No burden. When completing the target behavior, it is easy to give up the target behavior because of the obstacles in the process. No burden target behavior can provide a better experience for the users, so that it can be sustained in the long run.

Figure 3: The "three stages and six steps" persuasion strategy.

When young groups perform the target behavior of cervical spondylosis prevention, they should avoid causing obstacles such as time, venue and equipment, and make scientific time allocation and process design for exercise time to avoid increasing the cognitive cost, choosing the load, and reducing the action burden of completing the target behavior, so as to promote users' continuity of the target behavior.

5.3 The Third Segment After the Target Behavior Occurs

Feedback People expect to receive feedback after giving or receiving something, and this feedback will lead to a new sense of obligation to try to take new actions. Younger users are more concerned about the feedback they receive after completing the target behavior and will make adjustments based on that feedback, which in turn increases their motivation for the next behavior to occur after completing the target behavior.

6 DESIGN PRACTICE OF PERSUASION STRATEGY IN CERVICAL SPINE DISEASE PERVENTION PRODUCTS

6.1 Design Orientation

Based on the "three stages and six steps" persuasion strategy built for the prevention of cervical spondylosis in younger groups, we carried out product design practice for the prevention of cervical spondylosis in younger groups. Analyze the advantages and shortcomings of existing cervical spondylosis prevention products, add the concept of persuasive movement to the product, guide users to carry out neck activities independently and unconsciously, help the younger group to develop good neck habits and prevent neck discomfort and even cervical spondylosis.

The main functions of the designed product are:

- Remind and persuade users to exercise within a specified period of time.
- To guide users to exercise and reduce their burden when exercising.
- Help users to develop the habit of neck exercise.

6.2 Design Solution

A desktop movable intelligent robot is integrated and designed through the setting of the main functions. Users can set it according to their needs, and the robot makes appropriate reminders to persuade users to perform neck exercises within a specified time.

• The vibration and rotation of the robot attracts the user's attention and wakes them up from the long period of immobility, making them aware of the need for neck movement. At the same time, the neck of the robot is equipped with different colored light bands for flashing, highlighting the problem of the user's neck condition at different times, arousing the user's internal alertness and anxiety, stimulating the user's motivation to relax the neck, and thus achieving the design effect of persuasion.

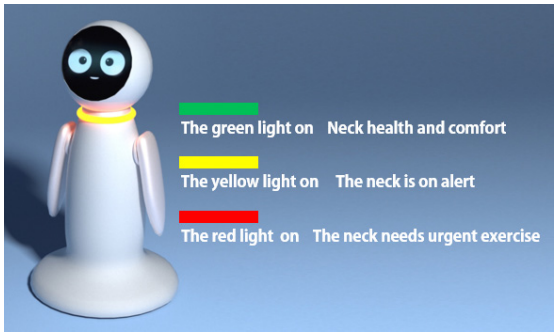

Figure 4: Product model display.

• Through visualization of neck exercise guidelines to make more users more concise and direct when doing exercise, reducing the user's

exercise burden. When the user is doing neck exercise, the screen on the head of the robot will show the current exercise and the next action guidance, and the head of the robot will also swing with the movement to interact with the user, increasing the fun and experience of the user when exercising, reducing the burden of exercise and thus making it easier for the user to form a habit.

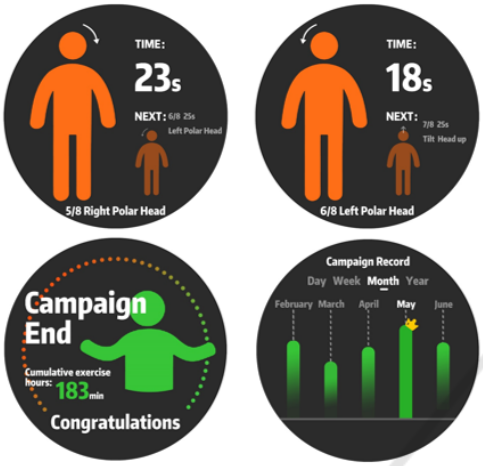

Figure 5: On-screen interaction interface.

• The screen on the head of the little robot shows the length and results of the exercise after the user exercises, giving the user positive feedback and helping the user to quickly understand the effect of their exercise, so that the user has a sense of satisfaction and accomplishment. At the same time, users can view their exercise situation for days, weeks, months and years, as well as their neck situation, which motivates users to carry out continuous target behavior.

7 CONCLUSIONS

The core of persuasive design is to guide or change the user's attitude or behavior. The high incidence of cervical spondylosis among young people is caused by bad behavioral habits and unconscious inertia of the neck. Therefore, to prevent the occurrence of cervical spondylosis, we should start from the young group itself, understand the behavioral and psychological characteristics of users, and apply suitable persuasive strategies to guide the young group to develop good neck habits and prevent the occurrence of cervical spondylosis.

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