Development and Evaluation of Nurses' Scrub Jacket through the Functional Design Process

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One of the issues of the medical uniform industry is to create nurses' scrub jackets that provide physical safety for the nurses while also affording nurses the maximum amount of comfort and personal freedom in the choice of materials and design details (Hamilton, 2011). With regard to improving the productivity and efficiency of nurses, comfortable and functional aspects are important to consider when evaluating the usefulness of nurses' scrub jackets in the workplace (Wiener, Galuty, Rudensky, Schlesinger, Attias, & Yinnon, 2011). Therefore, this study (1) investigated the current problems with nurses' scrub jackets by interviewing nurses, (2) developed new scrub jackets in order to aid in engaging in the design process, and (3) evaluated new scrub jackets. The new prototypes developed were based on the FEA framework (Lamb & Kallal, 1992) and Watkins' (1988) seven-step design process.

This study examined the existing issues and limitations of current scrub jackets by conducting a pre-focus group interview. Four female nurses, each of whom had at least five years of experience working in a hospital or the medical field, participated in the pre-focus group interview to provide feedback on existing scrub jackets. Based on their comments, six design criteria related to the FEA framework (i.e., fit/movement, line/shape, attractive/stylish, design details/convenience, durability, and professional appearance) were defined. An interaction matrix was also established to examine the relationships among the design criteria and recognize and isolate any differences or required changes (Watkins, 1988).

Next, three new prototype scrub jackets (Figure 1) for nurses were designed by considering the nurses' needs and dissatisfaction with the existing style. The three prototypes also applied effective fabric combinations considering participants' opinions and previous studies' results. The basic pattern was designed using the princess-line and at least six pieces to make the new prototypes appear slimmer and provide better movement for the wearer.

(A) (B) (C)

Figure 1. Front and Back Views of New Prototypes

To determine how well the prototypes addressed the identified problems and whether the new designs were satisfactory, a post-focus group interview was conducted. The prototypes were evaluated by 11 participants, and the post-focus group interview was conducted in the same conditions as the pre-focus group interview. In summary, all participants unanimously confirmed Prototype A as having the best material and Prototype B as having the best line/shape. The best movement, according to the participants, was provided by Prototype A. The best design details were the arm pen holders on Prototype C and the elastic waist belt of Prototype A. Moreover, participants pointed out several good things for all prototypes, such as the combination of woven and knitted fabrics, the slim silhouette and more stylish look of the various princess-lines, the many functional pockets, and the improvement of movement and fit using the functional pattern. All participants preferred the details of the jackets, such as the various pockets, the necklines, the pen holders, and the back waist belts, as these satisfied the functionality factor. In particular, the combination of the princess-line and key placement of the two fabrics (knit and woven) satisfied the participants in terms of comfort in movement.

This study not only found agreement among the participants on many issues related to the scrub jackets, but it also satisfied a variety of personal preferences through the design of the new prototypes. In addition, it is possible to gain a deeper understanding of the design case and generate an optimal design to provide better comfort and protection that is more acceptable to medical industry workers.

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