Maternity Support Garment: Part II – Product Design

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Abstract : *Four maternity support garments were designed based on the results of a marketing survey conducted locally. Based on the marketing results and the practical needs of pregnant women, main concepts and criteria of design had been figured out.*

Keywords: Maternity support garment, marketing survey, product design

Background: Many pregnant women suffer from low-back pain [1, 2]. The pain would have negative impact on pregnant woman's ability to work and would interfere with their activities of daily living [3-5]. Study has shown that supportive maternity wear can help to eliminate the low back pain [6]. In Part I of this study [7], we conducted comprehensive marketing survey locally to find out different features of maternity suppport garments. Based on the results and analysis of study in Part I, we proposed the design of different maternity support garments in this paper for further product development.

Methods: Information about retail stores available in Hong Kong for pregnant women care was collected through internet. Total 20 stores selling maternity support garments (belts, briefs, cradles and torso) were found with retail stores in Hong Kong. The features of different maternity support garment were reported and analzyed previoulsy [7]. In this study, we focused mainly on the product design based on the results obtained before [7]. The details of each design were discussed.

Results: The main concepts and criterion of design of maternity support garment should be carefully considered in order to develop an effective maternity support garment. Based on the marketing survey and the practical needs of pregnant women, main concepts and criterion of design has been figured out.

(A) Basic Concept

Based on the hypothesis is that the additional weight of the fetus would bring problem to those pregnant women who have long walking and standing hours each day. Therefore, it is desired to share the weight of the abdomen to the shoulder so as to relieve the weight of the lumbar-area-muscle. This leads to the design of use of cradle. Next, a widened front panel can help to increase coverage, so as to provide more support to the belly and lower back. Combining the effect of cradle and a widened front panel, the belly is expected to be stabilized during walking.

(B) Criteria of design

The criteria of design include: (i) the design should be able to share the weight of the abdominal to other part of body, i.e. shoulder as mentioned above, (ii) it should help to support the lower back yet would not be too stiff to induce discomfort and discourage movement, (iii) the design should be comfortable, as it is mentioned in most studies as an important criterion for intimate apparel, and (iv) the design should be flexible, it should be adjustable and can facilitate the adaption during pregnancy.

In a total, four designs have been created to cover the features of the existing products with the (A) basic concept and (B) criteria of design mentioned above. Figures 1 to 4 show the front and back of four designs. The special features of each design would be described below.

Figure 1. Design 1   Figure 2. Design 2
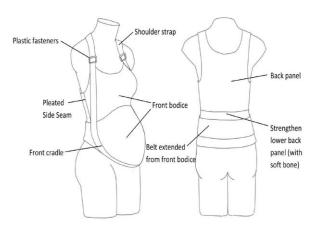
Figure 3. Design 3   Figure 4. Design 4

Design 1

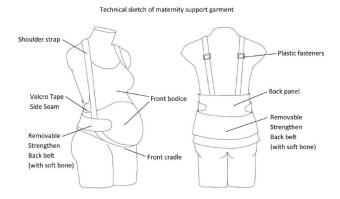Technical sketch of maternity support garment

There will be a full front and back bodice. A short belt at left of widened front panel will be used to stabilize the front and back, and an extra-long belt will be extended from right side of the widened front panel to the left side. The upper bodice is joined by pleated side seam. The features of Design 1 are shown in Table 1.

Full front and back bodice give the impression of wearing a vest instead of a medical garment for reducing low back pain. The construction would make it easier to be worn as it would be worn by like putting on an oridinary garment. The usage of one extra long belt extended from right side to left side instead of two belts extended from both side to the other would make it easier to be worn. The full front and back bodice would easier to make the pregnant woman feel hot as it has a higher coverage. The extra long belt from right side to left may make the provided support less even.

Table 1. Features of Design 1

Feature	Function
Pleated side seam	It can provide extra fabirc for extension when the belly of the pregnant woman grows, especially during the thrid trimester of pregnancy.
Front bodice	Full front bodice comprises of upper front bodice and the maternity belt. It can provide more support.
Back panel	Back panel comprises of upper back bodice and a strengthen lower back panel. The lower back panel has five soft bones inserted between the interlining and the outer fabric. These can provide extra support to the back.
Front crandle and shoulder strap	Front crandle is connected with the shoulder strap. With the front crandle put below the belly. it can help to share the weight of the belly to the shoulder, so as to reduce the load of the lumbar-area-muscle is bearing.
Plastic fasteners	They are placed on the shoulder straps, one at each strap. It is used for adjusting the length of the strap, so as to fit the body figure of the pregnant woman.

Design 2

Technical sketch of maternity support garment

There will be a full front bodice and a half back panel. Removable strengthen belt is designed to provide additional supporting function. It can be removed when unnecessary. The upper bodice is joined by velcro tape side seam. The features of Design 2 are shown in Table 2.Full front and halved back bodice give the impression of wearing a vest instead of medical garment for reducing low back pain. The coverage of back panel has been halved to reduce the amount of heat trapped. The usage of removable strengthen back belt provide higher flexibility for use. The usage of velcro tape side seam may make the garment more complicated to be worn, as the front and back bodice are not connected when user putting on it. Pregnant woman would need to fix front and back part on body one by one, and close the side seam with the velcro tape. This step would become more and more difficult during pregnancy. The removable back panel would add one more layer to the garment, which may make the pregnant woman more bulky.
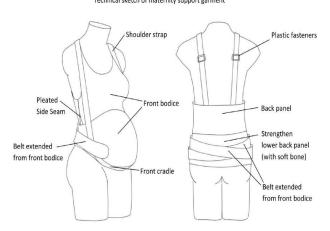
Table 2. Features of Design 2

Feature	Function
Velcro tape side seam	The velcro tape side seam design allows pregnant woman to adjust the side seam, so the garment can fit the graduclly increasing belly during pregnancy better.
Front bodice	Full front bodice comprises of upper front bodice and the maternity belt. It can provide more support.
Back panel	The coverage of back panel has been halved when compared with that of Design 1. It can help to reduce the amount of heat trapped.
Removable strengthen back belt	The back belt has five soft bones inserted between the interlining and the outer fabric which can provide extra support to the back.The strengthen back belt of Design 2 has been seperated from the back bodice when compared to that of Design 1. It increases the flexibility of usage, as it can be removed when it is not necessary.
Front crandle and shoulder strap	Front crandle is connected with the shoulder strap. With the front crandle put below the belly. it can help to share the weight of the belly to the shoulder, so as to reduce the load of the lumbar-area-muscle is bearing.
Plastic fasteners	They are placed on the shoulder straps, one at each strap. It is used for adjusting the length of the strap, so as to fit the body figure of the pregnant woman.

Design 3

Technical sketch of maternity support garment

Design 4

Technical sketch of maternity support garment

Similar with Design 2, there will be a full front bodice and a half back panel. There are two extra long belts extended from both side, crossed at back and stick to front so as to provide extra supporting function. The upper bodice is joined by pleated side seam. The features of Design 3 are shown in Table 3.
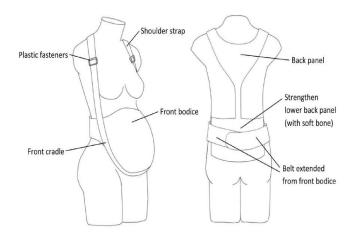
Full front and halved back bodice give the impression of wearing a vest instead of medical garment for reducing low back pain. The coverage of back panel has been halved to reduce the amount of heat trapped. The usage of two belts extended from both sides to the other help to provide a balanced support for each side. The usage of two extra long belts extended from both sides to the other may increase difficulty to wear the garment, as pregnant woman may need to cross hands at the back to exchange the belts to the other hand. Pregnant woman may find it more and more difficult durig pregnancy.

Table 3. Feature of Design 3

Feature	Function
Pleated side seam	It can provide extra fabirc for extension when the belly of the pregnant woman grow, especially during the thrid trimester of pregnancy.
Front bodice	Full front bodice comprises of upper front bodice and the maternity belt. It can provide more support.
Back panel	The back panel is comprised of the upper back bodice and the strengthen lower back panel. The coverage of back panel has been halved when compared with that of Design 1. It can help to reduce the feeling of hot. The lower back panel has five soft bones inserted between the interlining and the outer fabric. These can provide extra support to the back.
Front crandle and shoulder strap	Front crandle is connected with the shoulder strap. With the front crandle put below the belly. it can help to share the weight of the belly to the shoulder, so as to reduce the load of the lumbar-area-muscle is bearing.
Plastic fasteners	They are placed on the shoulder straps, one at each strap. It is used for adjusting the length of the strap, so as to fit the body figure of the pregnant woman.

It is the least coverage design. There is a half front bodice and back panel. The belts are extended from both side of front bodice and stick at the back panel. The features of Design 4 are shown in Table 4.

Least fabric coverage reduce the most possible heat trapped. The construction of design 4 is also the most simple, which would make it to be the easiest to be worn. The usage of two short belts extended from both sides to and sticked at the back may reduce the support it can provide. Also, although the constrction is simple, however, as there is no upper front and upper back bodice, it may increase the difficulty to fix the garment on body when it is worn.

Table 4. Features of Design 4

Feature	Function
Front bodice	There is no upper bodice. Front panel is consisted a full coverage maternity belt.
Back panel	There is no upper back bodice. There is only a back panel at the lower back area, which has five soft bones inserted between the interlining and the outer fabric. These can provide extra support to the back.
Front crandle and shoulder strap	Front crandle is connected with the shoulder strap. With the front crandle put below the belly. it can help to share the weight of the belly to the shoulder, so as to reduce the load of the lumbar-area-muscle is bearing.
Plastic fasteners	They are placed on the shoulder straps, one at each strap. It is used for adjusting the length of the strap, so as to fit the body figure of the pregnant woman.

Conclusion

In this paper, four newly maternity support garments were developed based on marketing search and product analysis of exitsing products in local market. The four designs had deifferent features which would be used for different needs. Thus, this study could provide useful information for future development of maternity support garment suitable for local context.

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