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## **Body Posture Change of Pregnant Women and Development of Mannequin for Abdomen-supporting Maternity Garments Design**

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### **ABSTRACT (NO MORE THAN 500 WORDS:)**

The body posture of pregnant women has no great change in early pregnancy. With fetal development, pregnant women's belly becomes large during the second trimester of pregnancy and late pregnancy. In order to maintain body balance during the latter stages of pregnancy, women must lean backward, causing lumbar lordosis that aggravates the lower back ligament, leading to back and waist pains. Abdomen-supporting maternity garments help supporting women's belly weight during pregnancy. The abdomen-support functions of pregnant women's underwear can be designed according to body posture changes during the pregnancy cycle. However, in China there are few brands of abdomen-supporting pants available to pregnant women, and research and development related to such garments is somehow not popular.

The growth of the fetus increases intra-abdominal pressure, and portal venous obstruction causes the upper and lower venous congestion of the rectum, at times resulting in internal or external hemorrhoids. The enlarged uterus pressing against the vessels also may cause dizziness in pregnant women. Therefore, the increasing size of women's belly during the second trimester and late pregnancy creates problems and poses health risks during the later stages of pregnancy. In addition, pregnant women have difficulty to find the right pants. Pants with appropriate abdominal circumference but rather large waist and hip circumference may easily fall, while those with appropriate waist and hip circumference but small abdominal circumference may have an adverse effect on fetal growth and development. As such, there is an urgent need for abdomen-supporting underwear that conforms to ergonomics and has both abdominal and waist supporting functions as well as a high comfort level.

The study conducted a two-year market survey on abdomen-supporting underwear and performed statistical analysis of body shape data of 26 pregnant women. We concluded that body posture of women during pregnancy can be divided into three stages – early pregnancy (8-12 weeks), second trimester (16-24 weeks), and late pregnancy (28-36 weeks) – with each stage having particular maternity garment requirements. Study findings can play a guiding role in structural design of abdomen-supporting underwear and development of dress forms for pregnant women.