



Conference Paper

Critical Design Aspects of Maternity Support-Garments and Its Contemporary Perspective

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Abstract

This study aims to understand the needs of plus-size pregnant women and critical design aspects for a pregnancy support garment and to emphasize the importance of inclusive design in this important product category.

The research examines the historical and societal connotations of maternity and the changes in support garment design associated with changes in the perception of the modern plus size Madonna. At the same time, it analyses the state-of-the-art in modern maternity support garments and examines data, gathered through a pilot online survey.

Keywords: Inclusive design, Support garments, Pregnancy, Maternity, Plus-size, women

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1 Introduction

Societal changes and perceptions of pregnant women have historically been reflected in the functionality and aesthetics of maternity garments. These days the design of these garments must deal with the desire to remain fashionable as well as the phenomenon of increased obesity.

The design of maternity support garments has changed over time, with modern support garments aiming to alleviate pregnancy-related discomforts, allowing women to maintain their active lives during pregnancy. Garments in the form of corsets, belts, bands, or briefs are currently recommended as treatment for pregnancy-related discomforts.

During pregnancy, there are multiple physiological and psychological changes that affect woman's perceptions of her body shape, body satisfaction, appearance evaluation and orientation, and as a result the choice of garments they wear. Physiological changes lead to discomforts affecting up to 80 per cent of women and are associated with changes in the body. These discomforts can present as moderate to severe depending on gestation and the mother's physiological makeup. Pregnancy-related discomforts may compromise functional mobility and result in disabling conditions during and post pregnancy, with obesity being a significant factor.

This study highlights the importance of inclusive design by informing the specific needs and performance requirements of plus-size pregnant women in a maternity support garment that have not been adequately considered before.

2 Study design and methods

Complex review of the texts on the sociology and history of fashion reveal the historical and social meaning of motherhood and maternity wear, including assumptions on the attitudes of expecting mothers towards their body and fashion. Statistical data presenting the demographical changes and fashion marketing completed the overview (ABS, 2015, Magner, 2014). Historical changes in maternity wear and state-of-the-art support garments for obesity and pregnancy were studied.

To evaluate the needs of plus-size pregnant women and critical design aspects related to support garment for their shape and body size, a pilot survey was conducted through online communities. Forums were themed under pregnancy and plus size pregnancy. Participants were between 22 and 36 weeks pregnant, 18 to 45 years old, and had not experienced any back pain, lower back pain, pelvic pain, or hip pain before pregnancy. Each participant's body mass index (BMI) was calculated based on their height and weight before pregnancy and respondents with BMI higher than 30 were selected for the study. The final sample consisted of 6 pregnant women with BMI above 30.

3 Results

3.1 Pregnancy and society

The history of maternity wear in Western societies is a history of constant fluctuation between hiding and exposing the pregnant abdomen. The reasons for this alternation arise from diverse social and cultural factors (Poli, 1988, O'Brien, 2005).

To understand these factors, we need to consider global social and cultural changes during the last twenty years. These changes have markedly affected the lives of women, such that contemporary motherhood and its historical antecedents can be differentiated and defined. A major factor was the role of the moral and religious values and beliefs and social taboos associated with pregnancy. When social trends allowed women to display the pregnant belly fearlessly and proudly, a very different set of values from the trend towards camouflaging pregnancies was celebrated (Miller-Spillman *et al.*, 2012) and a new type of woman emerged (Goodwin & Huppatz, 2010).

Pregnancy is not only a physical body state, but it has a strong symbolic meaning frequently explored in the arts and literature. Most commonly it represents fertility and the continuation of life (Kaiser, 1997). The open display of a pregnant belly aligns with

universal ideals concerning the importance of family, health, wealth, and procreation, regardless of the particular historical context. The famous and controversial cover of *Vanity Fair* (Collins, 1991) depicting pregnant and nude actress Demi Moore raised debates around the visual representation of motherhood and femininity in the mass media and marked the beginning of a new wave of debate about the role of the mother.

Currently, the correlation between pregnancy and what is socially acceptable as a fashion trend may be considered neutral - the major Western maternity trend is neither to hide nor to expose pregnancy. Nevertheless, the social aspects associated with pregnancy fashion still need to be considered. Pregnancy is no longer treated as an illness as it has in the past. These days the state of pregnancy does not generally limit propriety in regard to women's activities or social presence. That is why one of the major requirements for the modern maternity garment is the satisfaction of a woman's everyday need for an active and quality lifestyle, taking in consideration all possible complexities related to carrying the fetus and ensuring maximum possible pain relief.

Maternity clothing should provide comfort and necessary support for its wearer. These needs are more important to the pregnant woman than the social demand to camouflage pregnancy or decorative features of the garment itself, which have now become secondary concerns. Secondly, though not unimportantly, an aesthetically appealing maternity look represents the desire of women to remain fashionable while pregnant, maintaining their pre-pregnancy identity through clothing (Musial, 2003).

3.2 Historical changes in maternity wear

Predominating fashion trends can be divided into two categories. The first is characterized by the ease of adoption of fashion trends by maternity garments. The second category includes trends that cannot be transferred or applied to maternity garments. Thus a need to design special maternity garments emerges precisely in those periods when fashion may not be adaptable to the pregnant body.

Maternity wear has been a marginal sector of the fashion industry for a long while because of the constantly changing social perceptions of pregnancy. As for corsetry and supporting garments for pregnant women, these have always been classed as 'expedient material' rather than as fashion garments.

An increasing proportion of obese pregnant women has been observed during the last decades, raising the need for a reconsideration of maternity clothing design. On average, obese and overweight expecting women encompass 25% of all pregnancies (Sohn and Bye, 2015). A quarter of pregnant women demanding more advanced multifunctional garments is undoubtedly a significant development.

3.3 Support garments: history and state of the art

Pregnancy-related pains and discomfort derived from physiological changes during pregnancy have always been present in women because of the weight increase during gestation. Lower back Pain (LBP), Pelvic Girdle Pain (PGP), Fatigue, and general malaise are among the most common discomforts reported. These discomforts and pains are caused mainly by changes in posture, center of gravity, and gait. Interfering with work, daily activities and sleep and affecting quality of life (Norén *et al.* 2002).

Non-pharmaceutical relief measures for pregnancy pain, such a support garments, have been recommended to alleviate discomforts and pain during pregnancy. These garments can be classified into four main types: belts, briefs, cradles, and torso supports, with the belt being the most popular of all (Ho, 2008; Yip and Yu (2006).

Nowadays, support garments are widely recommended for expecting women to manage pregnancy with comparably less discomfort and overall better quality of life. Presently, there are around 60 different types of support garments available on the market and approximately 50 patents related to it, that claim to alleviate pains and discomforts. However, the majority of claims related to these support garments are not validated by relevant, available peer-reviewed research or clinical trials.

Admittedly previous studies have not investigated sufficiently plus size population requirements in relation to the development of support garments in larger sizes. This fact emphasizes the importance of inclusive design in the development of maternity support garments for plus size women.

3.4 Obesity and pregnancy in fashion design

Obesity is an epidemic affecting all, and Australia's levels of obesity are growing fast; the prevalence of obesity has increased from 56.3% in 1995 to 61.2% in 2007–2008, (ABS, 2014). This trend presents a new challenge in product design. The development of western societies shows an increased concentration on the importance of slim and light bodies, whereas “voluminous individuals fall further and further below standards of refinement” (Vigarello and Delogu, 2013). The latest Australia's Mothers and Babies report from the Australian Institute of Health and Welfare shows that in 2012, 20.7% of pregnant women with a known BMI were obese based on their BMI ratio at the first antenatal consultation.

The development of maternity support garments doesn't recognize this trend. The sizing of commercially available support garments ranges from XS to 4XL, depending on the garment mechanisms and technology of the material. Some of the simpler adjustable garments cover a waist size of up to 178 cm in circumference, while more complex products will only cover a waist circumference of up to 110 cm, which ultimately restricts the kind of garments available to obese women. These statistics highlight the need for the development of new products that address diversity and social inclusion.

As for garment design in maternity clothing, recent studies showed that the majority of expecting women, with no linkage to their BMI, prefer minimalistic and stylish garments, as well as practical rather than decorative and embellished garments. Maternity wear should look like non-maternity, but still be extremely functional for pregnancy.

Recent studies reported that higher BMI is usually related to lower levels of body satisfaction (Sohn and Bye, 2015) which emphasizes the importance of appropriate design in maternity wear for certain size groups.

3.5 Maternity garment's design aspects

Like non plus-size women, plus-size pregnant women are affected in the performance of Activities of Daily Living (ADL), mainly in sleeping, walking, standing, getting in and out of bed and getting up and down stairs, based on results of this initial study.

Support garments are recommended for all pregnant women, however, body size and morphology and garment functionality requirements of obese pregnant women have not been taken into consideration in garment design and engineering, resulting in a sub-optimal or absent solution for this specific population.

Although the obesity rate of pregnant mothers is growing rapidly, the offer for support garment for this population is still very limited and not adequate for their body size and type. There has not been created a garment scientifically evaluated and designed to respond to the needs of a plus size body during pregnancy.

Despite Yu (2001a) identifying that comfort, ease of movement, aesthetics, and support affect the preference for support garments, little research has been conducted to investigate the critical design aspects for the development of a support garment for the obese population. The critical design aspects should not be limited to size and shape but to lifestyle and multidimensional comfort: thermo-physiological comfort, sensory and tactile comfort, comfort during movement, and psychological comfort (Saville, 1999).

The themes that repeatedly appeared as critical design aspects for support garments during the pilot study were: reduction of pain and discomfort, don and doff easiness, allowance for the belly to grow, durability and the need for addressing of specific body needs like breast size, B Belly and sweet underneath the breasts.

Another finding of the survey is that plus size women prefer shorts, pants or leggings to girdles as a type of garments when asked to rank 6 different types of garment designs that included belts, bands, a tubular bandage and full torso garments. Currently, garments on the market that are available in sizes up to 4XL are belts, which came third as a preference over full torso garments and bands.

When the participants were asked why they prefer the selected garment, some of the responses included: the need for improving general comfort (posture support and improvement, abdominal support) and the avoidance of extra layers in the abdominal area to reduce body heat which was not mentioned in Yu and Wong Yu (2001b) study.

Another critical aspect studied in this initial survey refers to block shape for designing garments. L.M. Boorady (2014) suggests that plus-size manufacturers for the obese population should not assume that plus sizes are merely a proportionally larger small size and that the blocks should not be based on regular body shapes, but take into consideration the specific morphology, ergonomics, and comfort needs of this population.

In addition, findings from the 2003 size USA Project, show that it is apparent that the apparel industry only uses the basic hourglass shape when designing garments and a mathematically linear grade system to produce the garments of different sizes. The 2003 size USA Project found 63.7% of the population does not have hourglass figures, but rather a rectangle or spoon-shaped body. Present study confirms this notion through the results of the pilot survey: out of the six women surveyed; only one described her body to be of an hourglass shape, while others selected either the rectangle or apple shape options.

It is clear that there is a need to study and understand this specific population. Although all women may experience similar pains and discomforts during pregnancy, plus size women have particularities of their body shape and size that need to be addressed when designing a maternity support garment for them.

4 Summary and Conclusion

Despite the issue of beauty standards that continue to affect perceptions of motherhood (Rail and Harper, 2011, Musial, 2003, Goodwin and Huppatz, 2010)), the fashion industry has made some positive steps towards recognition of body diversity and differences. Yet remnants of past attitudes persist in contemporary fashion.

The perception of body shape, body satisfaction, self-appearance evaluation, appearance orientation, and desired clothing functions are important considerations in fashion in general and more so in the plus-size product category. Current plus-size maternity garments address current trends and consider change through the trimesters of pregnancy. They focus not only on functionality but also on aesthetics (Musial, 2003, Sohn and Bye, 2015). The development of maternity support garments for the modern plus-size Madonna should be a response to the growing obesity.

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