

# Investigation and Analysis on Women's Consumption Experience and Demand of Underwear During Menstruation

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## ABSTRACT

In order to have a comprehensive understanding of women's consumption experience and demand of underwear during menstruation, a questionnaire survey was conducted among women in menstruation from three aspects: the lateral leakage of menstrual blood, the feeling of wearing underwear during menstruation and the design demand for physiological period underplant. The results showed that more than 80% of women had menstrual side leakage during menstruation, and the morning and evening side leakage amount and side leakage area were different; Although the existing physiological underwear has the characteristics of variety of style, popular color and rich pattern, there are deficient in air permeability, resilience, color fastness and other aspects of fabric, especially in the prevention of blood leakage function is relatively weak. The existing physiological underwear do not fit well into the side drain area structurally. Most women said that physiological underwear could be novel in style, comfortable and flexible in fabric and leakproof, antibacterial, convenient and durable in function. The research results provide useful reference for underwear manufacturers.

**Keywords:** *consumption experience, consumption demand, underwear, women, menstruation*

## 1. INTRODUCTION

As one of the necessities of women's life, underwear is the closest knitted clothing that accompanies women for the longest time. It can protect the private parts from infection by exotic bacteria and has the role of the first line of defense [1-3]. The mature women must face a monthly physiological period. At this time, due to the accumulation of menstrual blood in the vagina and the thick sanitary towels on the genitals, and the increased grease of the lower part of body at this time, the breathability and ventilation of the genitals is poor. It is easy to cause various inflammation [4]. The characteristics of the physiological period make women have special requirements for the function of underwear.

In order to be able to understand more clearly and comprehensively the needs of women in the physiological period for underwear and provide references for companies to carry out reasonable product design, research and development and sales, in this paper, a questionnaire survey was conducted among women in menstruation from three aspects: the lateral leakage of menstrual blood, the feeling of wearing underwear in menstruation and the design demand for physiological period underwear.

## 2. RESEARCH PROJECT

The questionnaire design is based on closed questions,

supplemented by open questions. The contents of the research are mainly from the physiological and mentality perspectives to understand the three aspects of women's menstrual blood leakage and the experience of wearing underwear during the physiological period, and the design requirements for the physiological period underwear.

The survey was conducted in the urban area of Suzhou and its county level city.

The sample size of the survey was 350 people, mainly random samples of women with normal physiological cycles at the age of 15-55, 90 females aged 15-25, 112 females aged 25-30, 66 females aged 30-45 and 82 females aged 45-55 were selected with normal menstrual cycle. This questionnaire involves women of all aged and is evenly distributed, which ensures the universality, rationality and accuracy of this questionnaire survey, A total of 350 questionnaires were issued and 347 were eventually recovered, of which 342 were valid and 97.7% were efficient.

## 3. INVESTIGATION RESULTS AND ANALYSIS

### 3.1. The lateral Leakage of Menstrual Blood

#### 3.1.1. Menstrual Days and Blood Volume

**Table 1** Results of women's physiological period days and menstrual blood volume survey results

Duration of the physiological period						
days	<3	4	5	6	7	>7
ratio	2.6%	25.9%	34.9%	27.4%	5.3%	3.9%
Menstrual blood volume (Number of sanitary napkins used during menstruation)						
number	<5(small amount)		5-25(medium amount)		>25(large amount)	
ratio	1.6%		80.7%		17.6%	

Table 1 shows the results of women's physiological period days and menstrual blood volume survey results. As shown in Table 1, more than 80% of women's physiological cycles are concentrated in 4-6 days, and most of the blood volume is

mainly medium, with 17.6% of women being large. Among them, many female physiological periods will pay more attention to the quality and function of physiological underwear.

### 3.1.2. Percutaneous Leakage

**Table 2** Results of investigation of menstrual blood leakage in female physiological period (%)

Time of side leakage	Possible reasons of side leakage	ratio
Daytime	Sedentary during the day, cannot be replaced in time	62.3%
	Tampons displacement caused by excessive movement	31.5%
	Tampons displacement caused by the poor bonding of tampons and underwear fabrics	47.9%
	The tension of underwear leads to the mismatch between tampons and buttocks	26.1%
Nighttime	Sleeping at night is long and cannot be replaced in time,	62.5%
	Night sleep posture is not right	30.5%
	Tampons displacement caused by large amplitude of turning the body	45.2%
	Tampons displacement caused by the poor bonding of tampons and underwear fabrics	45.1%
	The tension of underwear leads to the mismatch between tampons and buttocks	18.5%

From the results of the survey in Table2, sedentary and excessive exercise during the day, sleep posture at night, sleep time and turn over are all likely to affect the displacement of the tampon and the flow of menstrual blood, eventually leading to menstrual leakage. This is mainly due to the fact that the human body has more forward movement during the day. When sitting for a long time, the blood mainly flows to the front of the crotch. The position of the side leakage is mainly concentrated in the front of the crotch. When the body is moving forward or the side movement is more, it is easy to cause sanitary cotton paste. Not fixed, easily causing leakage or lateral leakage. At night, the body's main posture of leaning back and turning over, most of the menstrual blood flows to the rear and side, and the leakage area is mostly concentrated in the groin part and side of the buttocks. Therefore, when designing physiological underwear, it is necessary to fully study the flow of menstrual blood caused by the movement posture of the human body. Second, it is necessary to test the specific flow area through experiments.

The pasting fastness and pasting position of tampon also cause menstrual leakage. The main reason is that the fabric of conventional physiological underwear cannot be well fitted with menstrual tampon, and its crotch structure cannot meet the flow of menstrual blood under various actions. And leakage area, there is a clear relationship between the menstrual blood leakage area of women and daytime and night. Therefore, the menstrual blood basin of the crotch should be divided during the physiological period, and the different needs of daily and night use should be classified. The underwear suitable for female physiological period should be

better designed. In addition, the choice of fabric should also be as far as possible to improve its pasting coordination with sanitary napkins and to blood leakage prevention function.

### 3.2. The Feeling of Wearing Existing Underwear in Menstruation

**Table 3** Results of the satisfaction survey on functional experience

Functions	elements	ratio
Fabric performance	Breathability	82.4%
	Fixation	73.5%
	Resilience	56.5%
	Softness	76.3%
Side leakage resistance	Small amount of side leakage	56.1%
	Large amount of side leakage	15.3%
	Will not leak	28.4%

The fabric of the pants during the physiological period is directly related to the physiological safety and body comfort of the women in the physiological period [-5]. The sweat absorption, elasticity, softness and color fastness of the fabric are one of the requirements for women to choose the pants during the physiological period. As shown in Table4-6, the existing physiological period of the pants with excellent breathability of 82.4% of women considered satisfactory, the color fastness performance of 73.5% of them considered

**Table 4** Results of the satisfaction survey on Wear trouble

Wear trouble	elements	ratio
Quality problem	Stitch line is not straight	17.2%
	Wired head, easy to take off the line	42.6%
Material question	Easy to wrinkle	32.1%
	Not easy to clean	57.6%
	Easy to fade	60.5%
	Poor hygrosopicity	45.8%
Structure question	Friction between the bottom crotch of tampons wing and thighs	72.4%
	The two layers of fabric at the bottom of the bottom are poorly breathable and difficult to clean.	54.2%
	The sewing thread at the bottom of the bottom makes the sanitary napkin and the underwear not fit.	38.5%
	sanitary cotton is prone to shift	75.3%

On the quality issue, 42.6% of the women think that there is a problem of the wire head and the easy-to-off line in the stitching; on the fabric, most women think that the fabric has the disadvantages of easy wrinkling, difficult to clean, easy to fade, poor moisture absorption, etc. After the blood flows out, after using the sanitary napkin, the privacy will be wet, the odor is heavy, the menstrual leakage of the side leakage is difficult to wash, and the bacteria are many. The ordinary underwear fabric is not suitable for women in the physiological period, and in the structure, the general underwear makes the sanitary cotton often shift, not fit, and the wings rub against the thigh. The situation of menstrual blood leakage is difficult to avoid. The main reason for these problems is that modern women have higher and higher requirements for quality. The requirements for underwear are not met; the second is that the specialty of the physiological period leads to menstrual blood leakage, blood stains on the underwear, and the characteristics of the fabric and the existing structure still cannot solve these problems.

### 3.2.1. Functional Experience of Pants during Menstruation

satisfactory, the softness performance of 76.3% of them considered satisfactory, and for resilience Only 56.5% of people think that they are satisfied, that is, the existing physiological period pants are easy to be deformed. This may be because the fabric of the pants in the physiological period is easily deformed due to the repeated pasting of the sanitary napkin, and it also reflects the resilience of the underwear fabric on the market. Cannot meet the characteristics of the physiological period.

According to the survey statistics, most women still have menstrual leakage problems even after using the physiology period. As shown in Table 2, 56.1% of women have a small amount of side leakage, and 15.3% of them have a large amount of side leakage. The side leakage is still the main problem faced by women in the physiological period. The pants in the market during the physiological period still cannot completely avoid the problem of the underwear and clothing being stained by the menstrual side leakage.

### 3.2.2. Feedback during the Physiological Period Wearing the Inner Library Troubles

### 3.2.3. Design Satisfaction of Pants during Physiological Period

**Table 5** Results of the satisfaction survey on design satisfaction

Design	elements	ratio
Decoration	pattern	21.4%
	decorative border	28.2%
	Lace	31.4%
	chiffon	25.2%
Style	Teenage type	28.4%
	Elegant	42.5%
	Fashion	31.3%
	Natural type	64.7%

From table 5, it can be seen that most women do not like the design of the existing physiological period pants, and the

design and application of patterns, laces, etc. cannot meet the requirements of women for beauty. Therefore, for the development designer of the pants during the physiological period, it may be considered to be functional. At the same time, considering the beautiful design, women can be confident and beautiful during their physiology.

Through market research, we have concluded that the style of underwear is mainly girl-style, elegant, fashion, natural and other styles. Most people prefer natural and elegant, but from the overall analysis, women still have a lot of unsatisfied design of underwear style, which provides innovative development space for the design and development of women's physiological period pants.

### 3.3. Selection of Design Elements of Underwear during Menstruation

#### 3.3.1. Style Design

**Table 6** Women's choice of design elements

Design	elements	ratio
Style	High waist	51.2%
	Mid waist	31.1%
	Low waist	17.6%

In the choice of styles, because most women wear briefs during the physiological period, it is also easier for women to accept the style, so the choice of design elements, only investigating low waist, middle waist, high waist line different Underwear, do not explain too much for other underwear styles. As shown in Table 6, 51.2% of women in the physiological period will choose high waist, while a small part will choose middle waist and low waist. The waist height of the market generally low waist underwear is lower than 8cm below the navel, because the waist is only in the hip circumference. Above, if the movement is slightly too large, it will cause the underwear to fall. Under such a large movement, the waist of the back hip will be pulled down quickly. The middle waist underwear and the high waist underwear are the better choice for the female in physiological period, because women are also more inclined to choose high-waist underwear, wearing a parcel on the lower abdomen when wearing, not only has a warmth effect, but also has a good maintenance effect on the female hip type. Choosing a high-waist style not only achieves a physiological protection, but also creates a safe and comfortable psychological state for women.

#### 3.3.2. Fabric Selection

**Table 7** Women's choice of design elements

Design	elements	ratio
surface material	Cotton fabrics	28.1%
	Bamboo fiber fabric	11.5%
	Modal fabric	27.5%
	Blended fabric	32.7%

In the fabric research, we selected the most common underwear fabrics on the market for the respondents to choose from. Among them, the blended, cotton and modal underwear are the types of underwear that women often choose when they choose underwear. Research shows that the blended fabrics It is made up of a certain proportion of cotton blended with chemical fibers. It has poor gas permeability and chemical fibers are irritating to the skin. It should not be worn close to the body. It can be seen that the underwear fabrics are not enough in the minds of the majority of women. The cotton fabrics are pure natural, moisture-absorbing and breathable, but not easy to dry. Women in the physiological period are due to menstrual cramps, plus the use of sanitary napkins, private places. It will bring a sense of dampness. If side leakage and skin contact occur for too long, it is prone to redness, itching and other symptoms. At present, there are still quite a few women who lack the safety and health awareness of underwear fabric selection. Many chemical pigments dye the fabric, greatly increasing the probability of women suffering from gynecological diseases [2].

#### 3.3.3. Functional Requirements

**Table 8** Women's choice of design elements

Design	elements	ratio
Feature	Basic type (breathability, comfort, etc.)	24.7%
	Anti-side leakage type (antibacterial, anti-side leakage function area, etc.)	75.2%

A large number of women also use functional underwear during the physiological period to avoid the problem of paralysis of menstrual blood leakage during the physiological period. However, the underwear that can be used in the physiological period on the market only has a single performance against side leakage, and the function is used. After the underwear, there will still be displacement of the sanitary napkin at night, and the panties that are generally available for the physiological period on the market still use the blended fabric as the main fabric of the underwear, and the functionality is imperfect. The anti-side leakage film layer is also poor in gas permeability. In appearance, the style of the underwear is singular, and the decorative performance in color matching and pattern application does not meet the aesthetic requirements of contemporary women. This kind of product seems to be in the name of the product. Women in the physiological period play a protective role, but the fabric brings more potential harm to women.

## 4. CONCLUSION

Women in the physiological period often have problems with menstrual leakage in their work and life, and the activities of daytime and nighttime events cause significant differences in menstrual leakage. The existing physiological period pants cannot meet the needs of most female physiological periods in terms of function and design. The combination of ventilation and anti-leakage cannot be achieved on the fabric. The structure cannot solve the problem of side leakage well. There are still some deficiencies in the sewing process. There

is still a certain space for thinking in design, and it is necessary to consider the pursuit of contemporary women's beauty. Ingenious use of lace, lace, and graphic design to enhance the fashion sense of underwear. When women buy physiology pants, they mainly choose the three elements of style, fabric and function. The style is mainly based on high waist; the fabric should be antibacterial, comfortable, highly elastic, and not fading; the design should not only pursue the aesthetic performance of the basic underwear, but also pursue the functionality.

Therefore, we should combine the aesthetics of design with the performance of anti-slip underwear in the physiological period, which can not only highlight the stylization of underwear, but also meet the pursuit of safety, comfort and aesthetic performance of contemporary women, making full use of ergonomic thinking. The function and structure of the underwear are refined and analyzed, and different structural design patterns are obtained, and the gaze of the physiological period is focused on the aesthetic experience from the inside out.

## **ACKNOWLEDGMENT**

This article is in the innovation and entrepreneurship training program for college students of Changshu Institute of Technology (No. XJDC2019312) and supported by Jiangsu University Philosophy and social science research project (No.2019SJA1288).

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