

An hygienical study on fomentation wear textile and design⁺

Shim, Boo-Ja

Prof., Division of Fashion & Textiles, Dong-A University, Busan, Korea

Abstract

The study with the subjects of the female consumers of the fomentation rooms in their 20s, this research made an investigation of the fomentation wear. Also, dye-fastness experiments of the wear's colors against washing and sweating were held. The following are the conclusions:

1. Survey Results of the Present Situations of Fomentation Wear

Designs of the fomentation wear, 88% belonged to a T-shirt (upper clothes) and knee pants. The primary colors of the wear were in the order of gray (37.5%), white (31.3%), orange (25%), indigo (18.8%), and yellowish (18.8%). 43% of the wear companies used the same color for two-piece clothes, and 57% employed different colors for upper and lower clothes.

2. Consumers' Attitude about Fomentation Wear

The key problem in the attitude to the wear, 25.9% pointed out the worries about physical exposure (like breasts and legs) owing to the improperness in designs and sizes. 32.8% of the subjects were also worried about physical silhouette exposure following sweating. The need for design improvement was felt as the subjects expressed their intention to use better fomentation wear in design and materials if the fare is higher.

3. Experimental Results of the Dye fastness of the Fomentation Wear

Dye-fastness experiments by sweating appeared in the order of gray > white > pink. The results by washing were gray & white > pink. As laundry grew in number,

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the grade of dye fastness fell a little bit. In the fomentation environment with more laundry and more perspiration, dye fastness of the wear's colors against washing and sweating should be fully considered.

Key Words : fomentation wear, fomentation room, dye fastness by washing,
dye fastness by sweating

I . Introduction

Today's rapid changes in socioeconomic aspects continue to bring about new senses of values and different ways of life. Following the recent introduction of the 5-weekday working system and the increase of people's interest in well-being and health, lots of people favor bathing and sauna as an important means of maintaining health.

As a result, we observe a new culture called "fomentation rooms (jjimjilbang)." According to the necessity of a family-unit resting space and people's zeal for wellness and beauty, fomentation rooms are gaining more interest from the public.

Naturally, among the stuffs supplied there, "jjimjilbok" or "fomentation wear" is a focus of concern. As the garment is worn in fomentation bathing rooms, it should maximize the function of rest. Proper design and materials are essential requirements. As human body sweats a lot in the humid and high-temperature environment, the materials of fomentation wear should be hygienically studied. In particular, the poorly-dyed colors of fomentation clothes can cause bad effects on human skin. That's why detailed research as well as improvement proposals are needed.

Jeon Jeong-ja¹⁾ studied the tendency of women's everyday use of fomentation rooms. But this paper is about fomentation facilities.

The consumers' complaints or materials in relation with fomentation wear have rarely been researched. So, this hygienic study of the present situations and materials of fomentation wear is thought to be somewhat significant.

First, fomentation room consumers in Busan were examined to consider the problems of current fomentation wear. Second, dye-fastness experiments were held in terms of clothing hygiene. The concrete aims of this paper are as follows:

- 1) To know the present situations of fomentation wear used in Busan's fomentation rooms.
- 2) To reveal the wear consumers' attitude as well as design and color preference.
- 3) To experiment fomentation wear's dye fastness against sweat and laundry.
- 4) To suggest improvement proposals meeting consumers' demands and comfort.

II . Research Contents and Methods

1. Present Situations of Fomentation Wear

1) Survey Period

In order to know the present situations of

fomentation wear worn in fomentation rooms, a survey was administered from March 2 through March 20, 2004.

2) Survey Areas

Centered on five wards in Busan where fomentation rooms are clustered, 16 fomentation shops were randomly chosen. <Table 1> describes the survey areas and the number of fomentation rooms.

<Table 1> Survey areas and fomentation rooms

Areas	Fomentation rooms
Dongnae-gu	4
Jung-gu	2
Busanjin-gu	2
Saha-gu	4
Haeundae-gu	4
Total	16

3) Survey Methods & Contents

For the concrete information of fomentation wear used in fomentation shops, various fomentation garments were provided by the shop owners. The wear's designs, materials, colors, and sizes were studied by the researcher.

2. Investigation of the Consumers' Attitude & Preference about Fomentation Wear

1) Subjects & Survey Period

120 women adults in their 20s or above, all residing in Busan Metropolitan City and

frequenting fomentation facilities, were given a questionnaire in two (preparatory and main) surveys between May 2 and June 6, 2004.

2) Survey Areas

Based on the preparatory examination results, 4 unisex places (Seomyeon, Nampo-dong, Jangjeon-dong, and Haeundae) were chosen, where young consumers were highly interested in uniforms.

3) Survey Methods & Contents

After proving inter-item consistency (Cronbach's alpha 0.63) of the preparatory survey contents, the final version questionnaire was completed. In order to know the consumers' attitude and preference about fomentation wear, 50 items were prepared, consisting of the use of fomentation wear, uniform satisfaction, improvements to expect and so on. The contents were either 5-scale Likert types or simple choices as shown in <Table 2>.

<Table 2> Questionnaire contents

Survey contents	Items
Use of fomentation rooms	5
Use of fomentation wear	10
Satisfaction of current fomentation wear	16
Improvements of fomentation uniform	14
Subjects' demographic characteristics	5
Total	50

3. Data Processing

The program of SPSS/win(ver 10.0) was used to reveal each item's frequency analysis.

4. Experimental Methods of the Dye Fastness of Fomentation Wear

1) Experimental Dates & Places

Dye fastness experiments were given at the Clothing Hygiene Lab of the Fashion & Textile Division in Dong-A University from June 20 through July 15, 2004.

2) Experimental Cloth

The experimental cloth in this study had the colors of favorite use in contemporary fomentation rooms: gray, pink, and white. Its characteristics are summarized in <Table 3>.

3) Experimental Methods

(1) Dye Fastness by Washing

According to KS K 0430, a color measuring device and Launder o-meter were used. The following procedure was kept.

- ① Prepare test pieces by 5×10cm.
- ② Put them in the washing fastness test container along with 100ml of 0.5% soap solution and 10 iron balls. This tester is run for 30 minutes (42±2 rpm) at 40℃ or 70℃.
- ③ Throw away the solution and put the test pieces in the container. Rotate the tester at

40℃ for 1 minute, changing water two times.

- ④ Dehydrate.
- ⑤ Measure and compare ΔE by the color measuring device.

(2) Dye fastness by Sweating

According to KS K 0715, a color measuring device and Perspiration-meter were employed. The following procedure was maintained.

- ① Prepare test pieces by 6.4cm×6.4cm.
- ② Soak them into the alkali sweat solution for 30 minutes and stir from time to time.
- ③ Make the test pieces 2.5–3.0 times heavier. Put the experimental cloth between two glasses and insert into the metal plates of Perspirometer. Add 4.54kg and put in the dryer (38±1℃) for at least 6 hours.
- ④ Measure and compare ΔE by the color measuring device.

III. Results & Review

1. Present Situations of Fomentation Wear

1) Design of Fomentation Wear








<Table 4> describes the present design situations of fomentation wear. Two pieces were 88%, one-piece dresses were 6%, and

<Table 3> Characteristics of the experimental cloth

Material	Percentage	Density (wale×course/ inch)	Weight (g/m ²)	Depth (mm)	Structure	Color
Cotton	100%	33×33	20.1	0.28	Knitwear	Gray
Cotton	100%	33×33	20.8	0.25	Knitwear	White
Cotton	100%	33×33	20.2	0.29	Knitwear	Pink

<Table 4> Design situations of fomentation wear

[Unit: %]

Shape	Design		Characteristics
One-piece (6%)			Half-sleeved dresses/ worn in females-only fomentation rooms
Gown (6%)			Long-sleeved gowns with front pockets/ worn in females-only fomentation rooms
Upper-lower (88%)	Up		Round-neckline half-sleeved T-shirt
			Narrow and long (5cm above elbow) sleeves
			Neck buttons/ chest pockets
	Down		10cm above knees/ waist sideline pockets
			5cm above knees/ waist sideline pockets

gowns were 6%. The second and third types were seen in fomentation rooms for females only, while the first type consisted of a T-shirt and pants. T-shirts, upper clothes, were basically half-sleeved but showed some design changes in necklines and pockets. Pants, lower clothes, were mostly knee-length, but some changes could be seen in trouser length and pocket shapes.

2) Materials

14 (88%) out of 16 companies used cotton, whereas the other two favored cotton plus hemp or cotton plus polyester. In the perspiratory environment, cotton is a favorite material owing to its high absorption of humidity.

Other fabrics are used to strengthen endurance or ventilation.

3) Colors

<Table 5> shows general color situations of fomentation wear. Gray leads colors, followed by white, pink, and indigo. Among the 16 products, 9 used different colors and 7 used the same colors for upper and lower clothes. In the former case, gray and white were respectively preferred for upper and lower garments. Other colors were indigo, orange, yellow, and sky blue. The order of colors in the latter case was orange, gray, yellowish, and white. The preferred use of gray, indigo, and orange rather than yellow or sky blue is

<Table 5> Design colors of fomentation wear

[Unit: frequency (%)]

Color Division		White	Orange	Pink	Yellow	Yellowish	Sky blue	Indigo	Gray	Total
Identical		1(6.3)	3(18.8)	·	·	1(6.3)	·	·	2(12.5)	7(43)
Different	Up	1(6.3)	·	1(6.3)	1(6.3)	1(6.3)	·	1(6.3)	4(25)	9(57)
	Down	3(18.8)	1(6.3)	1(6.3)	·	1(6.3)	1(6.3)	2(12.5)	·	
Total		5(31.3)	4(25.0)	2(12.5)	2(12.5)	3(18.8)	1(6.3)	3(18.8)	6(37.5)	16(100)

thought to be owing to the convenience of maintenance and laundry.

4) Sizes

<Table 6> sums up various sizes currently provided in fomentation rooms. The number of the shops providing L/M/S and XXL/XL/L/M was each 4 (25%). Three shops (19%) provided only one free size [namely, one size fits all]. Other fomentation rooms supplied XXL/XL/L, XXL/XL/S/M/S, XL/L/M/S, or L/M. This is because most kinds of fomentation wear are a combination of a T-shirt and knee pants, demanding no delicate size differentiation.

2. Consumers' Attitude & Preference about Fomentation Wear

1) Present Situations of Fomentation Room Use

The numbers and objectives of fomentation room use are shown in <Table 7>. The frequency of monthly use was 2~3 times (44.2%), while friends of the same sex (44.2%) or family members (33.3%) were accompanied. The subjects frequented unisex fomentation rooms (63.3%). They visited the rooms to get rid of fatigue (58.3%), to keep fit (17.5%), or to hold a meeting (7.5%). They stayed there for more than 5 hours (38.3%),

<Table 6> Sizes of fomentation wear

[Unit: frequency (%)]

Size	Frequency (n)	Percentage (%)
XXL, XL, L, M, S	1	6
XXL, XL, L, M	4	25
XXL, XL, L	2	13
XL, L, M, S	1	6
L, M, S	4	25
L, M	1	6
Free size	3	19
Total	16	100

<Table 7> Use of fomentation rooms

[Unit: frequency (%)]

Contents	Item	Frequency (n)	Percentage (%)
Recent monthly frequency	~1 time	50	41.7
	2~3 times	53	44.2
	4~5 times	12	10.0
	6~7 times	2	1.7
	8~9 times	1	0.8
	10 times~	2	1.7
Company	Family	40	33.3
	Friends of the same sex	53	44.2
	Friends of the opposite sex/ love	18	15.0
	Coworkers	5	4.2
	Others	4	3.3
Kinds of rooms	Women-only rooms	16	13.3
	Unisex rooms	76	63.4
	Both unisex and women-only rooms	28	23.3
Purpose of use	To remove fatigue	70	58.3
	For diverse meetings	9	7.5
	To heal hangover	5	4.2
	For a date	5	4.2
	For beauty and a diet	3	2.5
	To maintain health	21	17.5
	Others	7	5.8
Hours of use	~1 hour	5	4.2
	1~2 hours	7	5.8
	2~3 hours	26	21.7
	3~4 hours	24	20.0
	4~5 hours	12	10.0
	5 hours~	46	38.3
Total		120	100.0

2~3 hours (21.7%), or 3~4 hours (20%). In this respect, in today's culture of fomentation rooms as rest and recreation space, fomentation wear needs to be researched.

Among the improvements and requirements are its functions, design, and hygienic aspects.

2) Wearing Underwear Inside Fomentation Wear

<Table 8> shows the use of underwear inside fomentation wear and its reasons. 47.9% of the room consumers said they wore underwear, and 52.1% said no. The former group was worried about cleanness and sanitation (37.9%), physical silhouette exposure owing to perspiration (32.8%), and physical exposure due to improper designs or sizes (25.9%). On the other hand, the latter group rejected wearing underwear because they felt uneasiness or poor blood circulation (67.2%). Therefore, fomentation room consumers tended not to trust the sanitary laundry and management of fomentation wear. They turned out to be unsatisfied with the aspects of materials and designs. So, sanitation, sweating, and physical exposure should be considered compensation points in terms of materials and designs.

3) Wearing & Hygiene of Fomentation Wear

<Table 9> is about the survey on the wearing of fomentation wear and the attitude of fomentation room users. High points were given to the items that "Convenient uniforms are necessary even without wearing underwear" and that "I'll use fomentation rooms when they provide more expensive and more improved fomentation wear in designs and materials." So, their high demanding in terms of the wear's materials and designs can be felt. In addition, a lot of the subjects regarded fomentation wear as unclean, feeling the necessity of the hygiene-concerned regulations regarding the goods provided in fomentation rooms.

<Table 8> Wearing underwear inside fomentation wear

[Unit: frequency (%)]

Contents		Frequency (n)	Percentage (%)
Wearing (47.9%)	Cleanness, hygiene	22	37.9
	Physical exposure (e.g. breasts and legs) owing to improper designs/sizes	15	25.9
	Sweating to cause physical silhouette exposure	19	32.8
	Others	1	3.4
	Total	57	100.0
No wearing (52.1%)	Uneasiness, poor blood circulation	39	67.2
	Unprepared underwear	12	20.1
	Others	7	12.1
	Total	62	100.0

<Table 9> Wearing & hygiene of fomentation wear

[Unit: frequency (%)]

Item	M	SD
Women with no underwear is a nuisance.	2.9	1.2
Depending on designs, underwear can and cannot be worn.	2.8	1.1
Convenient uniforms are necessary even without wearing underwear.	3.9	0.9
I'll use fomentation rooms when they provide more expensive and more improved fomentation wear in designs and materials.	3.4	0.9
The goods provided in fomentation rooms are not clean.	3.4	0.7
Hygiene-concerned regulations are needed regarding the goods provided in fomentation rooms.	4.0	0.8

※1: Don't agree at all~5: Agree a lot (M: Mean, SD: Standard Deviation)

<Table 10> Contents of the satisfaction survey concerning fomentation wear

Item			M	SD
Overall size specifications			3.0	1.0
Design	Up	Length	3.1	0.8
		Neck girth	3.4	0.9
		Sleeve width	3.1	0.8
		Sleeve length	3.2	0.8
	Down	Length	3.1	0.9
		Trouser width	2.2	0.9
		Lower length	4.0	0.8
		Waist band area	3.2	1.0
		Waist size	3.2	0.7
Material	Absorption		2.1	0.8
	Thick enough lest breasts look through		3.4	1.0
Color	Color		2.6	0.8

※1: Quite improper~5: Quite proper (M: Mean, SD: Standard Deviation)

4) Satisfaction Survey Regarding Fomentation Wear

<Table 10> is concerning the satisfaction survey about the present fomentation wear. In

general, low points were in the items of materials and colors. Rather high satisfaction was noticed in size specifications, because current fomentation wear mostly consists of a T-shirt and short pants and does not demand

delicate body type classification. Fairly satisfactory were designs, but the lowest points were seen in trouser width. Low degrees of satisfaction was observed in sweat absorption, thickness, and colors of the current fomentation wear. Thus, better and satisfactory fomentation wear should be superior in these three aspects.

5) Preference of the Design Types of Fomentation Wear






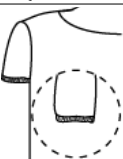


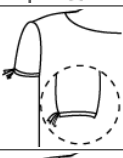



1) Upper Clothes

From the investigation of the present fomentation wear and dissatisfaction, designs and materials were found to need improvement.

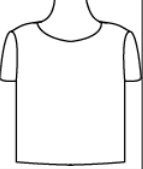

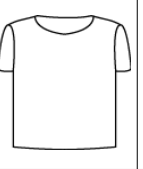
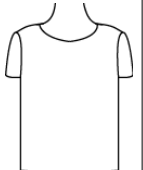

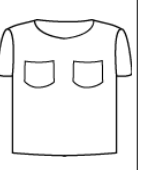





The following are the detailed results for the design improvement of the wear in order to increase satisfaction of fomentation room consumers.

Among the necklines, round (51.7%) and V (42.0%) were highly favored, as they are favorite types in the established ready-made clothes. Among the sleeve types, set-in (47.5%) and Raglan (35.8%) were popular because they look comfortable. As for sleeve length, half-sleeve (or 5-bu, 70.0%) and short-sleeve (or 3-bu, 25.0%) were preferred. Long sleeves (5%) were unpopular owing to lots of perspiration and high temperature in fomentation rooms. As to sleeve bottoms, normal (67.5%) and cut (18.3%) were leading types, and the subjects were not much interested in the design factors of sleeve

<Table 11> Preference of neckline & sleeve types

Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)
Round		62	51.7	Set-in sleeve		57	47.5	Normal		81	67.5
Square		1	0.8	Puff sleeve		6	5.0	Rubber band		7	5.8
V		48	40.0	Raglan sleeve		43	35.8	Binder		10	8.3
Key-holder		9	7.5	Drop sleeve		14	11.7	Cut		22	18.3
Total		120	100	Total		120	100	Total		120	100

<Table 12> Design preference of upper clothes

Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)
To the waist		29	24.2	No decoration		93	77.5	No pockets		45	37.5
To the hip		88	73.3	Chest strings		9	7.5	Two (chest)		17	14.2
To the thigh		3	2.5	Waist strings		3	2.5	Two (waist)		26	21.7
				Button straightening		15	12.5	One (central waist)		32	26.7
Total		120	100	Total		120	100	Total		120	100

bottoms and merely favored simple types with no ornaments.

Concerning the length of upper clothes, to the hip (73.3%) and to the waist (24.2%) were prevalent. Too long clothes are uncomfortable as they stick to the body after sweating, while too short clothes are unpleasant owing to the risk of body exposure before a lot of people sharing the room. No straightening (77.5%) and button straightening (12.5%) reveals that room consumers think higher of convenient activities than of design elements. Pockets (62.5%) and no pockets (37.5%), waist pockets (48.4%) and chest pockets (14.2%)—

these mean that room users prefer fomentation wear with pockets in order to hold their cell phones or small belongings. So, pockets should be fulfilling in both functions of containing things and looking beautiful.

2) Lower Clothes



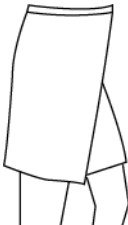




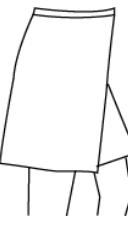
In the preference of the waist area, strings (58.3%) were more liked than the rubber band type for all sizes (41.7%) because they are controllable according to one's own physical size. As to the length of lower clothes, knee length (44.2%) and 10cm above knees

(43.3%) were similarly favored. Longer lower clothes were less selected because of uncomfortable sweating. The straight trouser width (89.2%) was preferred, while wide trunk (7.5%) was less wanted owing to the risk of physical exposure during long hours of lying on the floor and narrow trunk (3.3%) was less liked owing to its uncomfortable movement in fomentation rooms mainly for rest or sleep.






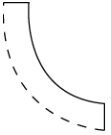


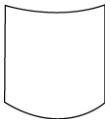


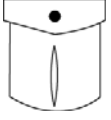
In the trunk bottoms, general (61.7%) was the highest, followed by cut (20.8%), strings (10.8%), and rubber band (6.7%). This result

was similar to that in sleeve bottoms, reflecting that the room users think convenience is more important than designs. The favored positions of pockets were side line (57.5%) and below waist (29.2%), maybe because the subjects felt comfortable with ordinary pocket locations covered by upper clothes. As to the pocket shapes, round (40.8%) and cover (25.8%) were mostly loved owing to the function of containing things, not the aesthetical design.

<Table 13> Design preference of the waist and length of lower clothes

Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)
Rubber band		50	41.7	10 cm above knees		52	43.3	Straight		107	89.2
Strings		70	58.3	Knee length		53	44.2	Narrow trunk		4	3.3
				10 cm below knees		15	12.5	Wide trunk		9	7.5
Total		120	100	Total		120	100	Total		120	100

<Table 14> Design preference of the trouser cups and pockets of lower clothes

Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)	Div	Shape	Fre (n)	Per (%)
General		74	61.7	Below waist		35	29.2	Straight		20	16.7
Rubber band		8	6.7	Side line		69	57.5	Round		49	40.8
Strings		13	10.8	Thigh area		10	8.3	Basic		20	16.7
Cut		25	20.8	Hip area		6	5	Cover		31	25.8
Total		120	100	Total		120	100	Total		120	100

6) Color Preference of Fomentation Wear

<Table 15> shows color preference of fomentation wear. For upper clothes, gray was 20.0%, followed by yellowish (14.7%) and indigo (12%). For lower clothes, indigo was

the highest as 30.7% and gray was next as 14.7%. In unisex fomentation rooms, women tended to avoid bright colors for the fear of physical exposure. In general, dark colors like indigo and black seemed to be favored.

<Table 15> Color preference of fomentation wear

[Unit: frequency (%)]

Color Div	Red	Yellow -ish	Green	Sky blue	Pink	White	Gray	Black	Brown	Indigo	Fluorescent
Upper clothes	2 (2.7)	11 (14.7)	4 (5.3)	10 (13.3)	4 (5.3)	10 (13.3)	15 (20.0)	5 (6.7)	4 (5.3)	9 (12.0)	1 (1.3)
Lower clothes	3 (4.0)	3 (4.0)	5 (6.7)	5 (6.7)	6 (8.0)	7 (9.3)	11 (14.7)	8 (10.7)	4 (5.3)	23 (30.7)	.

<Table 16> Experimental results of the dye fastness of fomentation wear

Div.		Gray		Pink		White	
		ΔE	Grade	ΔE	Grade	ΔE	Grade
Dye fastness by washing	5 times	0.787	5	1.809	4	0.525	5
	10 times	1.086	4-5	1.975	4	0.917	4-5
	20 times	1.377	4-5	2.340	4	1.093	4-5
Dye fastness by sweating		0.740	5	1.172	4-5	1.032	4-5

* ΔE = color difference before and after laundry

3. Experimental Results of the Dye Fastness of the Fomentation Wear

<Table 16> shows the comparatively superior results of the dye fastness of the fomentation wear by way of washing and sweating. After 5 times of washing, dye fastness was grade 4 (pink) or 5 (white/ gray). After washing 20 times, the grade was a little lowered: 4 (pink) or 4-5 (white/ gray). Based on sweating, the grade was rather high: 4-5 (white/ pink) or 5 (gray). But the above experimental results reflect normal living environments. As fomentation rooms will have more perspiration and more laundry, however, dye fastness is expected to have lower grades.

4. Design Improvement Proposals of Fomentation Wear

Based on the attitude and preference of the fomentation wear users, their demands can be reflected as follows in design improvement proposals.

1) Design

The silhouette exposure of breasts owing to sweating as well as the exposure of legs owing to the wide trouser trunk were pointed out. Color adjustment or pocket decoration can make up for upper clothes, while narrowing trouser trunk or using bottom strings can improve the design of lower clothes.

2) Colors

As the subjects showed low satisfaction to the present colors of fomentation wear, the colors of their choices—gray, yellowish, sky blue, and pink—are selected for the improved up-down fomentation wear.

3) Materials

As 47.9% of the subjects said they wore underwear inside fomentation wear for cleanness and hygiene, the current wear needs to be checked and compensated in terms of materials. In consideration of the fomentation room's environmental characteristics, the materials should be highly absorptive of water and moisture and there should be some hygiene-related regulations.

IV. Conclusion

With the subjects of the female consumers of the fomentation rooms in their 20s, this research made an investigation of the present situations of the fomentation wear as well as their attitude and preference concerning the wear. Also, dye-fastness experiments of the wear's colors against washing and sweating were held. The following are some conclusions about the wear's improvement proposals.

1. Survey Results of the Present Situations of Fomentation Wear

First, as for the designs of the fomentation wear, 88% belonged to a T-shirt (upper clothes) and knee pants.

Second, cotton was the leading material, followed by cotton plus polyester and cotton plus hemp.

Third, the primary colors of the wear were in the order of gray (37.5%), white (31.3%), orange (25%), indigo (18.8%), and yellowish (18.8%). 43% of the wear companies used the same color for two-piece clothes, and 57% employed different colors for upper and lower clothes.

2. Consumers' Attitude & Preference about Fomentation Wear

First, as the key problem in the attitude to the wear, 25.9% pointed out the worries about physical exposure (like breasts and legs) owing to the improperness in designs and sizes. 32.8% of the subjects were also worried about physical silhouette exposure following sweating. The need for design improvement was felt as the subjects expressed their intention to use better fomentation wear in design and materials if the fare is higher.

Second, as for the preference of upper-clothes designs, round neckline (51.7%), set-in sleeve (46.7%), and half-sleeve (or 5-bu/ 84%) received the highest percentage. For lower clothes, waist rubber band type (58.3%), knee length (44.2%), and straight trouser width (89.2%) were favored. As to colors, the order of preference was gray > indigo > white > pink. Bright upper clothes and dark lower clothes turned out to be their choices.

3. Experimental Results of the Dye fastness of the Fomentation Wear

Dye-fastness experiments by sweating appeared in the order of gray > white > pink.

The results by washing were gray & white > pink. As laundry grew in number, the grade of dye fastness fell a little bit. In the fomentation environment with more laundry and more perspiration, dye fastness of the wear's colors against washing and sweating should be fully considered.

4. Improvement Proposals of Fomentation Wear

First, the silhouette exposure of breasts owing to sweating as well as the exposure of legs owing to the wide trouser trunk were pointed out as main problems. Color adjustment or pocket decoration can compensate for upper clothes, while narrowing trouser trunk or using bottom strings can improve the design of lower clothes.

Second, as the fomentation room users showed rather high satisfaction to the colors of gray, yellowish, sky blue, and pink, they should be used for the improved up-down fomentation wear.

Third, in consideration of the fomentation room's environmental characteristics with great perspiration, the materials should be highly absorptive of water and humidity.

This research was limited to the Busan area, so there should be further careful processes for the generalization of the design preference results of this study. However, according to the recent increase of the population frequenting fomentation facilities, fomentation wear should be continuously studied to make it more fashionably designed as a well-made high-valued product.

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