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Innovation Article

Underwear innovation for hemorrhoids patient

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A B S T R A C T

Background: Symptoms experienced hemorrhoid sufferers are feeling pain in the anus, especially in sitting position. It is necessary to innovate special underwear which can reduce pressure on the anus and the pain experienced by the patient

Objective: the study aimed to create and analyze special underwear for hemorrhoid sufferers which increased comfort and reduce the intensity of pain.

Methods: This research imitated Research and Development (R&D. It consisted of 3 stages; stage I (literature study), stage II (product development) and stage III (product experiment).

Result: The literature study in stage I obtained materials used to create special underwear for hemorrhoid sufferers by Cotton Combed 30s of 100% premium cotton and foam as a cushion. In the second phase of the research, designs and shapes were obtained. The results of product experiment in the third phase of the study discovered that respondents felt more comfortable by the special underwear than ordinary underwear and it was very effective in reducing pain.

Conclusion: The innovation of hemorrhoid underwear is effective to increase comfort and reduce pain intensity in hemorrhoid sufferers.

INTRODUCTION

Hemorrhoid, also known as *wasir* or *ambeien* in Indonesia, is a disease due to the swelling of veins in the rectum or anus. The incidence of hemorrhoids tends to increase accordingly to the age, where the incidence is higher in someone aged 20-50 years. There are no official data regarding the hemorrhoid prevalence in Indonesia, but the number of hemorrhoid sufferers in the world is estimated to be 4.4% of the total population [1–3].

Hemorrhoids is triggered by increased pressure in the lower rectum and anus. This increased pressure causes the hemorrhoidal veins to swell. Symptoms that may be experienced include pain and bleeding in bowel movements. Pain usually increases when the sufferers are in sitting position because the swollen veins are depressed when the patient sits, especially when sitting without a hard cushion[4,5].

Based on the interviews with some patients of hemorrhoids, they said that they used a pad like a towel or other cloth to avoid the hard pressure when sitting, thus pain can be slightly reduced. To deal with unbearable pain, the patient uses pain-reducing drugs. Therefore, it is necessary to innovate special underwear for hemorrhoid sufferers which can reduce pressure on the hemmoroidal vein to reduce the pain of hemorrhoid sufferers.

Various studies illustrated to the management of hemorrhoids which are on medical management, such as surgery, pharmacology by pain relievers and vasoconstriction drugs, relaxation distraction techniques to reduce pain [1,6–12].

This study aimed to develop and test special underwear for hemorrhoid sufferers to improve comfort and reduce the intensity of pain in patients with hemorrhoids.

METHOD

Study Design

This study was a research and development (R&D) [13,14]. It consisted of 3 stages; stage I (literature study), stage II (product development) and stage III (product experiment).

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Research Phase I

At this stage, researchers look for appropriate materials and suitable as materials for the development of special underwear for hemorrhoid sufferers.

Research Phase II

It was the stage of product manufacturing and disposal. Researchers designed special hemorrhoid underwear according to the patients' needs, with a comfortable shape and design. Hemorrhoid special underwear was equipped with foam padding at the bottom which served to reduce pressure on the anus (Figure 1). These pants were made in several sizes; (L) 81-88 cm waistline, (XL) 89-96 cm waistline, (XXL) 97-107 cm waistline.

Research Phase III

This stage was a trial or experimental phase [15]. The product of the under-developed underwear was tested by comparing it with the ordinary underwear. The sample used was 60 patients with hemorrhoids [16].

The product testing was conducted in January-April 2019 at community health center 1 Kembaran, community health center 2 Kembaran, community health center 1 Sumbang, community health center 2 Sumbang, community health center 1 Ajibarang, community health center 2 Ajibarang and Ajibarang Regional Public Hospital.

The test was carried out by requesting to the respondents to use common underwear, and later, the respondents were told to change the underwear into hemorrhoid underwear. Respondents were measured for their comfort and pain response level of normal underwear and special hemorrhoid underwear. Data regarding pain levels and comfort levels were tested using the Wilcoxon rank test [17].

RESULTS

Based on literature study in finding materials, researchers discovered that this special underwear was appropriate to use Cotton Combed 30s base material of 100% premium cotton. Combed is made from long cotton fibers. Cotton Combed 30 s provides good air circulation and flexible. This material is also easy to absorb the sweat and smooth texture so it is more comfortable to wear.

At the product manufacturing stage, special underwear for hemorrhoid sufferers is created with Cotton Combed 30s fabric equipped with dacron foam as a cushion at the bottom which serves to reduce pressure on the anus. The difference between your common underwear and hemorrhoid underwear is seen in Figure 2 and Figure 3.

Based on the results of the test, 60 respondents with hemorrhoids were mostly male (61.7%), and > 45 years old (51.7%), besides, most hemorrhoids were external hemorrhoids (63.3%) (Table 1). There were 37 respondents who experienced a decrease in pain levels after wearing hemorrhoids underwear, while 26 respondents said that the pain level was the same as before wearing special hemorrhoid underwear. Statistical results showed a significant difference in the reduction in pain levels to the wearing regular underwear and after using special hemorrhoid underwear p <0.01 (Table 2).

Table 1. Respondent characteristics (n=60)

Characteristics	Frequency	Percentage
Gender		
Female	37	61.7%
Male	23	38.3%
Age		
17-25 years old	1	1.7%
25-35 years old	12	20%
35-45 years old	16	26.7%
>45 years old	31	51.7%
Occupation		
Civil servants	13	21.7%
Self-employed	17	28.3%
Housewife	20	33.3%
Labor	10	16.7%
Hemorrhoid Type		
External Hemorrhoid	38	63.3%
Internal Hemorrhoid	22	36.7%
Level of Pain of regular underwear		
No pain	0	0%
Mild pain	10	16.7%
Moderate pain	40	66.7%
Severe pain	10	16.7%
Level of Pain of special hemorrhoidal underwear		
No pain	3	5%
Mild pain	30	50%
Moderate pain	25	41.7%
Severe pain	2	3.3%
Comfort in wearing ordinary underwear		
Comfortable	38	63.4%
Uncomfortable	22	36.6%
Comfort in wearing special hemorrhoid underwear		
Comfortable	54	90%
Uncomfortable	6	10%

In the variable of comfort level, it presented 54 respondents (90%) said that it was more comfortable using special hemorrhoid underwear than regular underwear, while 6 (10%) said it was uncomfortable. Statistical results proved a significant difference in the level of comfort when wearing special hemorrhoid underwear compared to normal underwear p <0.001.

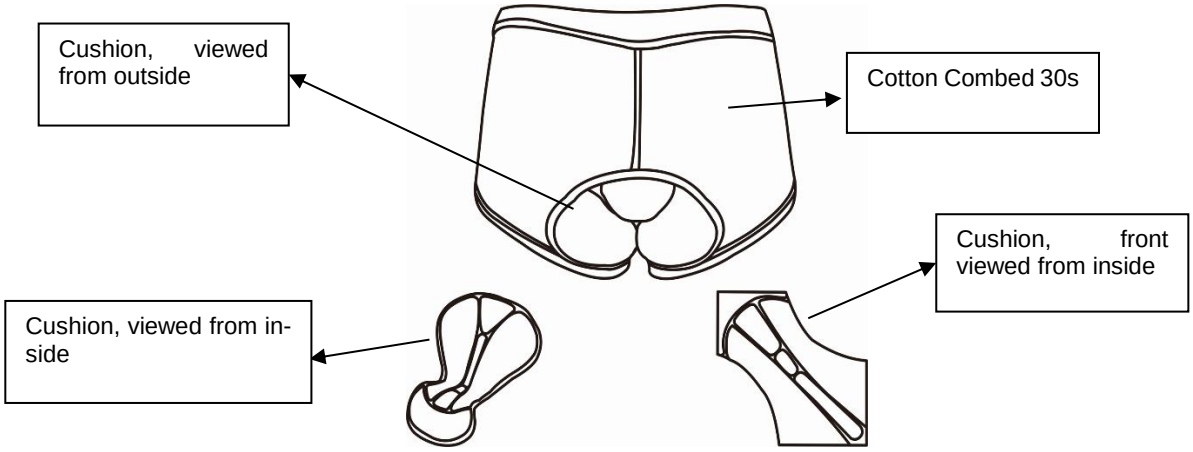

Figure 1. Design of special underwear for hemorrhoid

Figure 2. Regular underwear

Figure 3. special underwear

Table 2. Difference in pain intensity and comfort level of regular underwear and special hemorrhoid underwear (n = 60)

Regular underwear – special hemorrhoid underwear	n	Mean Rank	Z	p-value
Pain level	34[a]	17.50	5.831	0.0001
Negatif Rank				
Positif Rank	0[b]	0.00		
Ties	26[c]			
Comfort level				
Negatif Rank	0[a]	0.00	3.540	0.0001
Positif Rank	16[b]	8.50		
Ties	44[c]			

a. hemorrhoid underwear < regular underwear
b. hemorrhoid underwear > regular underwear
c. hemorrhoid underwear = regular underwear

DISCUSSION

The results of product test illustrated that respondents felt less comfortable in wearing regular underwear in sitting position and causing pain. However, by special hemorrhoid underwear, respondents said that the pain was reduced.

The depressed anus of a hemorrhoid patient in sitting position would increase pain stimulation received by nociceptors by releasing mediators such as leukotrienes, prostaglandin E2, histamine and K + ions. Histamine, bradykinin, and prostaglandin E2 contributed to vasodilatory effects and increased blood vessel permeability. This caused local edema, increased tissue pressure and nosisepto excitability. When nociceptors were stimulated, it released the

peptide substance P (SP) and the peptide-related calcitonin gene (CGRP), which would stimulate the inflammatory process and also produced vasodilation and increased the permeability of blood vessels. This nociceptive impulse produced the pain [18–20].

Special hemorrhoid underwear is a pant made for hemorrhoid sufferers to improve comfort and reduce pain. These panties are the same shape as normal panties, but the difference from ordinary pants was that this special panties were supported with pads which could reduce pressure on the anus.

The characteristics of the soft dacron cotton material would help a hemorrhoid patient to experience comfortable sit and reduced pain because the buttocks were not directly depressed and blocked by a cushion. These pads reduced the stimulation of the anal nociceptors because the pain mediator was not released so that the patient's pain was reduced.

The material used for the fabrication of special underwear was a soft and comfortable cotton to wear. Cotton fabric was a fabric which was 100% derived from natural plant fibers, contains no chemicals, and provided hypo-allergenic properties. Besides, this fabric was more comfortable to wear because the fabrics were hollow like ventilation so the skin can have a breath.

CONCLUSIONS AND RECOMMENDATION

The innovation of special hemorrhoid underwear is proven to increase the comfort of patients and reduce the level of pain experienced by hemorrhoid sufferers. Therefore, the patient is recommended to use special hemorrhoid underwear. For health workers, it is advisable patients with hemorrhoids to use special hemorrhoid pants both before and after hemorrhoid surgery in order to increase comfort and reduce pain.

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