

## **Evaluation of surgical operations rooms' clothes Functionally, economically and aesthetically**

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### **ABSTRACT**

The study problem determined to be addressed in regard to one of the important types of functional clothes, that are used in a large and important sector such as the medical sector in Egypt, with no clear picture of the specifications that are followed during selecting this type of clothes.

To achieve these objectives study followed the first: the descriptive method (analytical method), in order to describe and analyze the reality of medical clothes used in surgical operating rooms in some hospitals and specialized centers, including the methods of dealing with these clothes, and the extent of the existence of technical specifications to be followed when choosing these clothes, Second, the experimental method represented in the self-experience of the researcher through the field study.

Applied study has been carried out by conducting a field study through designing questionnaires (1), (2) which have been directed to some surgeons in Dakahlia governorate, they have numbered in this study (63 physicians), as well as a group of surgical operating rooms' nurses and some of the responsible for buying surgical operating rooms' clothes, their total number in this study (88 members) as follows: (55 members) of the nursing staff, as well as the application has been applied on the (33-member) of the participants in committees for the purchase of surgical operating rooms' clothes.

#### **The study found:**

- There is no follow of local or international specifications or standards laid down by the competent bodies when choosing surgical operating rooms' clothes, and thus selected clothes are not sufficient to provide enough degree of protection and safety for its users.
- The majority of surgeons do not agree on the current design of surgical operating rooms' gown, and cause them a lot of harassment during their work, in addition to they do not feel comfortable while wearing it.
- Great percentage of surgeons are using the durable gown in hospitals where they work, but they personally prefer to use (Disposable gown).

#### **The study recommends the following:**

- Medical facilities should follow local and international specifications and standards criteria when choosing surgical operating rooms' clothes.
- Trend towards the use of disposable surgical operating rooms' clothes in hospitals due to their high level of health safety and their low cost compared to durable surgical operating rooms' clothes.
- A lot of comparative studies should be applied on disposable and durable surgical operating rooms' clothes.

**KEYWORDS:** Surgical Operating Rooms – Clothes – Functional Performance.

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### **INTRODUCTION**

In general and hospitals in particular, play a prominent role in the present era in the field of the most important and dangerous thing, which is the field of preservation of the most expensive and the most precious thing in the world, namely health, whether it is the individual's health or the health of society as a whole, so health organizations contribute to try to reach to the desired development rates at the national level through its participation in the achievement of health goals as a whole.

However, this role may become a heavy burden on the shoulders of private governments in the developing world, which called for the intervention and capital of the private sector in this area as an investment in improving and developing the quality and level of services against payment of the additional funds, including covered by these services of medical specialties, and economic aspects, management services, social aspects, employees, and technical aspects of engineering.

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There is no doubt that interest in the public appearance and the level of hygiene's in hospitals is one of the most important elements of the high level of patient satisfaction what you offer these hospitals of different services, but also no doubt that the clothes these workers represent the first elements of this theme.<sup>(7)</sup>

Clothes are a source to protect the human and from the various factors that are harmful to his health, they are also considered the most important reasons that may bring a lot of health damage and numerous diseases, as one of the most important functions' clothes is to cover the body human to allow its protection from all harmful by the external influence of environmental factors and variables.

The textile industry has moved into new and many areas in recent years, such as medical fields, which was the role of the textile industry is limited to its traditional role in supplying this field patients' and doctors' clothes and bedding in hospitals, but that role extended to include the design and manufacture of alternative mankind devices such as vascular substitutes, as well as surgical sutures industry as well as for use before and after surgery, as well as medical abdominal belts, bandages, compression bandages and medical socks. Because of medical textiles designed and manufactured in Egypt is a new area, the volume of production can be described as low which does not cover the demand for it and it is the matter which imported from abroad, and this is beyond the capacity of many.<sup>(9)</sup>

#### **The study problem:**

The study the problem determined in the following questions:

1. Is there a specification is based on the selection of medical clothes used in surgical operating rooms?
2. Is there satisfaction with the level of surgical operating rooms' clothes by its users?
3. Which is better functionally medical dressing manufacturer of woven fabrics or manufacturer of non-woven fabric?
4. Which is better economically medical dressing manufacturer of woven fabrics or manufacturer of non-woven fabric?
5. Which is better aesthetically medical dressing manufacturer of woven fabrics or manufacturer of non-woven fabric?

#### **The importance of studying:**

The importance of this study is:

1. Opening the field of study in one of functional types of clothes, which are used by large and vital sector of society.
2. Provide with the selection criteria of surgical operating rooms' clothes in order to achieve standards (better functional performance - the low economic cost - aesthetic appearance appropriate).
3. Try to develop mechanisms that will raise the level of health awareness among users of medical dressing rooms used for operations.

#### **Objectives of the study:**

The study aimed at:

1. Identify the criteria of choosing surgical operating rooms' clothes locally and internationally.
2. Evaluation of the economic, health and aesthetic aspects of surgical operating rooms' clothes.
3. Evaluation of surgical operating rooms' clothes which manufacturers of woven and non woven fabrics used in surgical operating rooms of some hospitals.
4. Identify to specialists' point of view in the medical field in the level of surgical operating rooms' used in some hospitals, and the extent of satisfaction with them.

#### **Previous studies:**

Previous studies on the subject of study among themselves agreed to emphasize the need to provide adequate medical clothing for workers in the medical care sector, especially working in surgical operations rooms, so as to provide protection for the wearer and check the best properties of functional and aesthetic performance to her, as well as the need to address the processing of these clothes in different ways to fit in with This performance, in addition to the need to keep abreast of developments in follow international standards in the design and production of medical clothing.

**Richard L. Fischer's study in (2007)** entitled (the impact of medical clothes on patient satisfaction for the preparation of operations and gynecology outpatient) to the importance of clothing doctors surgical operating rooms and their role in achieving the satisfaction of patients in clinics of obstetrics and gynecology, and to achieve this goal (20) doctors were selected randomly distributed on Clinics Obstetrics and Gynecology for three months to wear different types of medical clothing (Traditional - updated) also has the use of a number (116) of the patients who were hesitant to these clinics in that period, and asked each patient to express his opinion on the clothes doctor through a survey of opinion for ten minutes, which assesses the psychological level of satisfaction of the patient, as well as doctors' professionalism , the study found that there were not significant differences in the level of public satisfaction with the clothes traditional doctors or updated.<sup>(10)</sup>

Also **Hisham Ahmed Assem' study in (2010)**, entitled (design and operation of medical clothes in light of safety and occupational safety concepts) aimed to identify safety concepts and workers safety in the medical field in the hospitals, and studying of the foundations of the design and operation of medical clothes preventive made of fabrics, non-woven single-use, as well as the study of the properties of non-woven fabric (Disposable) in the medical apparel industry, as well as to submit proposals in the form of clothes which achieve the actual needs of physicians during their work in hospitals, and try to prepare a guide of the design and operation of protective clothing for workers in the medical field in light of security and safety professional concepts, the study has come to put some criteria's for the design and production of medical dressing technical requirements, namely:

1. Simple designs are preferred.
2. Pattern sizes should be few wide to be suitable with the nature of doctor performance at work.
3. Following the standard tables for measurements of objects depending on the standard specifications of the General Authority for Standardization.
4. Choose raw materials and work tests to determine the characteristics and specifications of the raw material to find out its behaviors during the design and implementation.<sup>(5)</sup>

About the quality and production of clothes and surgical operating rooms' products **Heba Khamis study in (2007)**, entitled (quality standards and design of some textile products used in the surgical rooms) try to put a scientific basis for achieving quality standards and production of some products used in the Surgical rooms to provide security to its users to achieve protection with prevention pollution.

For this purpose some different samples of non-woven fabrics were grouped and the production of other samples of woven fabrics were studied to resistant bacteria property, the study reached to the untreated fabrics resistant for bacteria did not give any resistance against microbes, and that there is a direct correlation between resistance to treatment fabrics for bacteria where fabrics increased ability to resist bacteria treatment.<sup>(4)</sup>

Also **Maha Talat study in (2009)**, entitled (improving the functionality of fabrics used in the medical field for preparing to resist bacteria and remove dirt) aimed to reach the best raw tissue is gaining removing dirt and reduce the activity and the proliferation of bacteria, the study found that:

1. Alhnekom installation achieved the best result of the properties.
2. The material cotton/viscose was the best result of the different properties, followed by cotton 100%.
3. The best mix processing can be used with variables of the study are Ssanitized-99 with Arkofil cmc 300.
4. The best concentration was 3 g / l.
5. The best soften material was SEDICO N2 50.
6. The best temperature to install was 150°.
7. The best time to install was 3 minutes.<sup>(8)</sup>

As well as **Ahmed Ramzy study in (2011)** entitled (the quality of medical apparel manufacturing standards in light of technological changes) aimed to study the fabrics, medical garments manufacturing technology (patients clothes) produced from antimicrobial woven fabrics, setting quality standards (aesthetic and functional quality of performance) for the manufacture of medical clothes in governmental and private hospitals, as well as providing technical files for designs of the proposed medical treatment against bacteria clothes for garment factories.

The study carried out some of the proposed designs of the treatment fabrics against bacteria and presented in a scientific manner through the work of a technical file for each design includes a series of stages beginning from the definition of the product, its parts, measurements, technical and molecules in the design with surrounding industrial processes analysis to sew the design and quality standards necessary for it and a list of raw materials used in the implementation, and then presented to a group of arbitrators separately.<sup>(1)</sup> **Applied study:**

In this study questionnaire (1) was designed and directed to a group of surgeons in some Egyptian hospitals, as well questionnaire (2) was designed and directed to some of operating rooms' nursing staff, and officials of the purchase of medical garments in some Egyptian hospitals, in order to assess the reality of medical clothes used in operating rooms and to identify local and international standards for the selection of those clothes, in order to determine the best specifications in medical operating rooms' clothes in which to achieve the best functionality properties required in addition to the aesthetic appearance and the suitable coast.

Each questionnaire included on cover contains a definition of the subject of the study, with its aim, each questionnaire has been divided into several topics, and each axis includes a set of phrases that are useful for evaluating one of operating rooms' clothes use aspects, their economic side, how to deal with them, and the satisfaction of its users, every phrase is followed by all the choices available in front of a doctor or nurse operating room and the official of purchase surgical operating rooms' clothes to choose what express his opinion.

It was also to do field visits to some hospitals and medical centers which follow Mansoura University, and some public sector's hospitals in Dakahlia Governorate, (63) surgeons were selected in some hospitals, and also a group of members of operating room nursing, their number has reached in this study (55 Nurse), as well as the application has been on a group of officials buy surgical operating rooms' clothes, has numbered in this study (33

members), all individuals (the study sample) were different in the type of medical facilities in which they work, as well as the duration of the work these installations.

## RESULTS

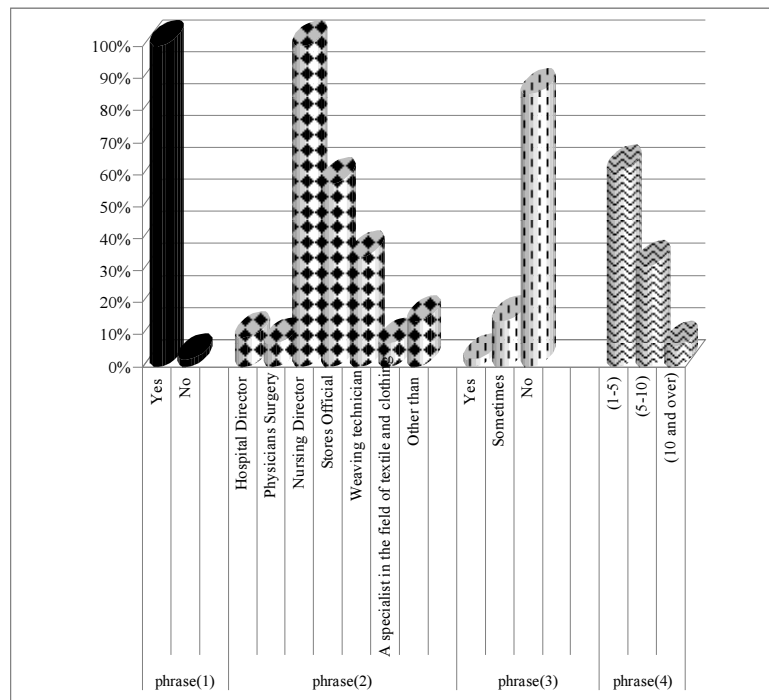
**Table (1) shows the frequencies and percentages for phrases with the first axis in questionnaire (1) entitled: (Standards of choosing surgical operating rooms' clothes)**

Phrases	Frequencies and percentages		
	Choices	Frequency (63doctors)	percentage
1- Is there a standard against which to choose clothes operating room?	Yes	63	100 %
	No	0	-
2- From choosing clothes based operating rooms?	Hospital Director	6	9.52 %
	Physicians Surgery	5	7.93 %
	Nursing Director	63	100 %
	Stores Official	36	57.14 %
	Weaving technician	22	34.92 %
	A specialist in the field of textile and clothing	5	7.94 %
	Other than	9	14.29 %
3- Are you involved in the selection of clothes operating rooms?	Yes	0	-
	Sometimes	9	14.29 %
	No	54	85.71 %
4- What is the average number of patients attending the operating room a day?	(1-5)	39	61.90 %
	(5-10)	20	31.75 %
	(10 and over)	4	6.35 %

- **Phrase No. (2)** can choose more than one response together.

Table (1) show that the whole by (100%) referred to the existence of standards selection, but these standards set by the medical facility, according to the annual budget, and the international standards have no really application on, and this is evident from the results of the phrase number (1) in the table.

About asking each doctor from Surgeons for his participation in a personal capacity in committees who choose surgical operating rooms' clothes, (9 physicians) (14.29%) of the study sample showed that they have already participated in the selection of surgical operating rooms' clothes for specified periods, while the rest of the respondents, representing (85.71%) showed that they have never participated in that selection, and the results shown in phrase No. (3) in the table represent it, and these results graphically represented by Figure (1).



**Figure (1) shows the percentages for phrases with the first axis in questionnaire (1)**

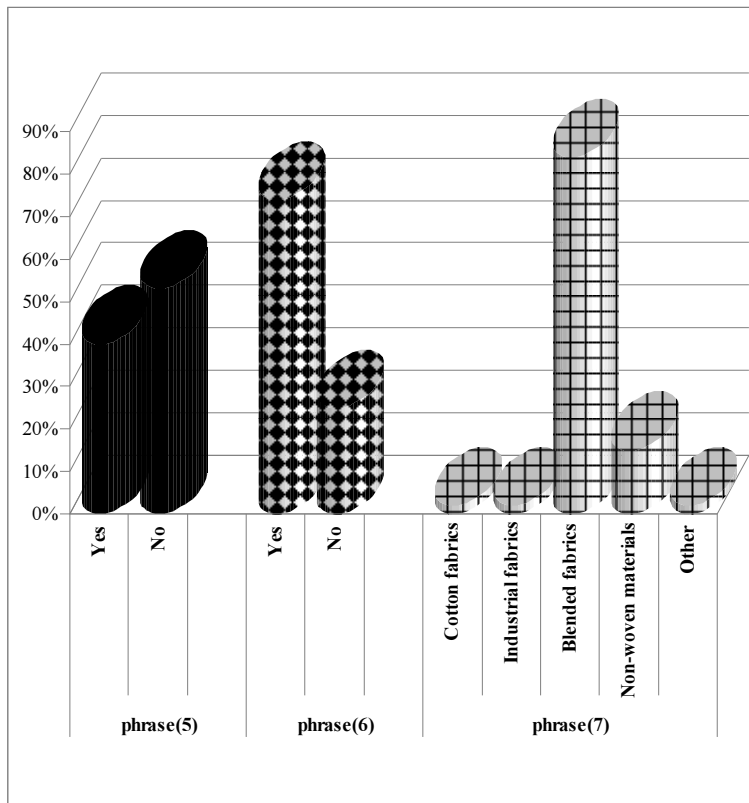
**Table (2) shows the frequencies and percentages for phrases with second axis in questionnaire (1) entitled:  
(Reality of surgical operating rooms' clothes)**

Phrases	Frequencies and percentages		
	Choices	Frequency (63 doctors)	percentage
5- Do you agree with the current format of clothes surgeon in the operating room?	Yes	29	40,03 %
	No	34	53.97 %
6- Is the current design of these clothes can cause you any harassment at work?	Yes	47	74.60 %
	No	16	25,39 %
7- What severity of used clothing in the operating room?	Cotton fabrics	0	-
	Industrial fabrics	0	-
	Blended fabrics	53	84.13 %
	Non-woven materials	10	15.87 %
	Other	0	-

Table (2) showed that more than half of the study sample (34 physicians) representing (53.97%) are not agree with the current format of the surgical operating rooms' gown. These doctors have attributed the lack of consent in the first place to gown's material, which sometimes are heavy as some of them explained, as well as gown's design, which came in second place in terms of dissatisfaction with doctors about it, while all respondents by (100%) showed their satisfaction with gown's color, it is illustrated by the results of the phrase number (5) in the table.

When asking doctors about the harassment that can be caused to them during their work, (47 doctors) representing (74.60%) showed that the main disadvantages of the current gown are: it's height is not enough, followed by gown widening which causing them some harassment at work and finally how to wear or take the gown off came in third place in terms of being a disadvantage of the current as it shown with phrase No. (6) in the table.

About the gown's material (53 doctors) representing (84.13%) of the study sample showed that their gowns are of blended fabrics, while the rest of the members explained sample representing (15.87%) they are using the disposable gown and the phrase number (7) in the table shows these results, and Figure 2 represents these results graphically.



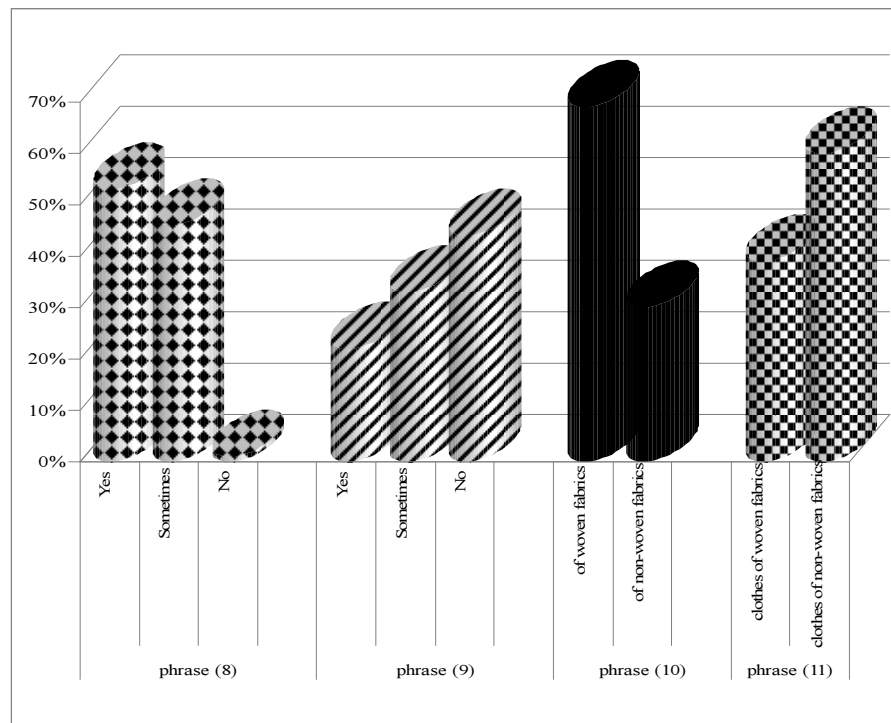
**Figure (2) shows the percentages for phrases with the second axis in questionnaire (1)**

**Table (3) shows the frequencies and percentages for phrases with third axis in questionnaire (1) entitled:  
(Functional aspect of the surgical rooms' clothes)**

Phrases	Frequencies and percentages		
	Choices	Frequency (63 doctors)	percentage
8- Are doctor's clothes affect the level of performance in the surgical operating room?	Yes	34	53.97 %
	Sometimes	29	46.03 %
	No	0	-
9- Do you feel comfortable while wearing surgical clothes inside the surgical operating room?	Yes	14	22.22 %
	Sometimes	21	33.33 %
	No	28	44.44 %
10- Which kinds of clothes do you use more in the surgical operating room?	Clothes of woven fabrics	44	69.84
	Clothes of non-woven fabrics	19	30.16 %
11- Which is better, from your point of view?	The use of clothes of woven fabrics	25	39.68 %
	The use of clothes of non-woven fabrics	38	60.38 %

Table (3) shows the most important results of evaluating functional performance of the surgical operating rooms' clothes, there are (34 doctors) representing (53.97%) of the study sample that surgical gown always affect the movement of the doctor and his performance in surgical operating room if it did not provide him with the necessary and enough comfort for his work, while the rest of the study sample representing (46.03%) showed that this gown affect their performance sometimes only, and about their comfort feeling while wearing the gown (14 doctors) representing (22.22%) of the study sample showed that this gown provide comfort for them during their work, while explained (21 doctors) representing (33.33%) of the study sample that this comfort they feel in some cases only, while the rest who represent the largest percentage of respondents (44.44%) showed that they do not feel this comfort during wearing the surgical gown, and these results are shown ferry number (9) in the table, and this is consistent with the results of the two ferries numbers (5), (6) in Table (2).

About type of gown that doctors use more in the surgical operating rooms, (44 doctors) representing (69.84%) of the study sample showed that they use the gown of woven fabrics, but in the same regard the most representing (60.32%) of the study sample have shown that they prefer to use the gown of non-woven fabrics, because they see that it is characterized by the provision of the health safety for it's, in addition to it's light-weight materials, these results referred to in the statement number (11) in the table, while the rest, representing (30.16%) of the study sample reported that they are using the gown of non-woven fabrics, it is illustrated by the results of the phrase (10) in the table, and these results graphically represented by Figure (3).



**Figure (3) shows the percentages for phrases with the third axis in questionnaire (1)**

**Table (4) shows the frequencies and percentages for phrases with first axis in questionnaire (2) entitled:  
(Economic cost of surgical operating rooms' clothes)**

Phrases	Frequencies and percentages			
	Choices	Frequency (33 member)	percentage	
1- What is the average number of gowns purchased every year?	Durable Gown	200-400 gown	0	-
		400-800 gown	0	-
		800 gown and over	33	100 %
	Disposable Gown	500-1000 gown	0	-
		1000-1500 gown	0	-
		1500 gown and over	33	100 %
2- What is the average price for gown used in surgical operating room?	Durable Gown	(10-30) pounds	0	-
		(30-50) pounds	21	63.63 %
		50 pounds and over	12	36.36 %
	Disposable Gown	(10-30) pounds	33	100 %
		(30-50) pounds	0	-
		50 pounds and over	0	-
3- Do you see that the cost of buying surgical operating room's gowns represents a burden financially for the facility?	Yes		19	57.58 %
	Sometimes		14	42.42 %
	No		0	-
4- What is the average number of surgical operations performed daily in the hospital?	(1-5) operations		7	21.21 %
	(5-10) operations		18	54.55 %
	10 operations and over		8	24.24 %
5- How many gowns consumed every year?	Durable gown	200-400 gown	0	-
		400-800 gown	0	-
		800 gown and over	33	100 %
	Disposable gown	500-1000 gown	0	-
		1000-1500 gown	0	-
		1500 gown and over	33	100 %

Table (4) shows assess the economic side surgical operating rooms' clothes, all respondents by (100%) said that the number of durable gowns which the hospital buy every year is (800 gown and over) for durable gowns and more than (1500 disposable gown, and this amount is determined by the hospital, according to the average number of operations performed each year, as shown in the results of the phrase (1) in the table.

About the average price of both types of gowns (21 members), representing (63.63%) of the study sample, explained that the average price of durable gowns between (30-50) pounds, also (100%) showed that disposable gowns' coast is less expensive, where the price ranges between (10-30) pounds and (19 members) representing (57.58%) of the study sample showed that the cost of buying surgical operating rooms' clothes represent a heavy burden financially for hospitals in which they work, while the rest of the sample (42.42%) have made it clear that this cost becomes burden Only in the case of co-operation for the first time with a new supply points, and this compared to previous years.

About gowns' number consumed annually of the quantity purchased, the whole by (100%) showed that this amount exceeds (800 durable gowns) and also beyond (1500 disposable gowns), as all respondents added that purchased quantities of both gowns' types often implemented before the end of the year.

**Table (5) shows the frequencies and percentages for phrases with second axis in questionnaire (2) entitled:  
(Functional aspect of the surgical operating rooms' clothes)**

Phrases	Frequencies and percentages		
	Choices	Frequency (55 nurses)	percentage
6- Do you agree with the current form of nurse's clothes in surgical operating room?	Yes	16	29.09 %
	No	39	70.91 %
7- Is the current design of these clothes can cause you any harassments while working in surgical operating room?	Yes	36	65.45 %
	No	19	34.54 %
8- What is the material of clothes used in surgical operating room?	Cotton	0	-
	Poly-ester	0	-
	Mixed fabrics	42	76.36 %
	Non-woven fabrics	13	23.64 %
	Other	0	-
9- Do you feel comfortable while wearing surgical operating rooms' clothes?	Yes	13	23.64 %
	Sometimes	36	65.45 %
	No	6	10.91 %
10- Which kind of clothes do you use more in surgical operating room?	of woven fabrics	42	76.36 %
	Of non-woven fabrics	13	23.64 %
11- Which is better from your point of view?	Medical clothes of woven fabrics	46	83.64 %
	Medical clothes of non-woven fabrics	9	16.36 %

Table (5) shows the nurses' views of surgical operating rooms' clothes specifications, data indicated that (70.91 %) of the study sample refused the current design of nurses' surgical clothes while (29.09 %) agree with the same design.

Data represented in the table show that (65.45 %) of the study sample referred to some harassments that can be occurred as a result of using the gown, firstly gown's material recorded the first score in the feeling of uncomforted as it caused burden at work, secondly gown's width as nurses mentioned that the gown was unsuitable to their personal sizes, finally they reported that gown's length was unsuitable for them, especially the disposable gown, also in the same time (34.54 %) from nurses stated that the gown's current design doesn't cause any harassments for them as it recorded in phrase (7).

About gown's material (76.36 %) from nurses referred to using the gown of blended materials, while (23.64 %) from nurses use the gown of non-woven fabrics as it recorded in phrase (8).

Data represented in the same table show nurses' comfort feeling while wearing the gown, as (65.45 %) of the study sample confirmed their feeling of comfort only sometimes, as there are some factors reduce this feeling as it recorded in phrase (9).

On the other hand (23.45 %) from nurses confirmed that the current gown provide them comfort feeling during their work, while (10.91 %) showed that they don't feel this comfort during wearing it as it recorded in phrase (9).

The same table included date referred to (76.36 %) of nurses use the gown of woven fabrics, while (23.64 %) from them use the gown of non-woven fabrics as it recorded in phrase (10).

Personal opinions which prefer any of gown's two kinds has explained in the same table (5), as (83.64 %) from nurses prefer the gown of woven fabrics, as it doesn't suffer from repeated washing and sterilization, while they reported that the gown of non-woven fabrics has a light weight material and insulting liquids as it explained in phrase (11).

On the other hand (16.46 %) from nurses prefer the gown of non- woven fabrics as they mentioned, so this sort of gowns can and doesn't need washing or sterilization, so it can provide health safety for it's users, as it reported in phrase (11) and these results graphically represented by Figure (4).

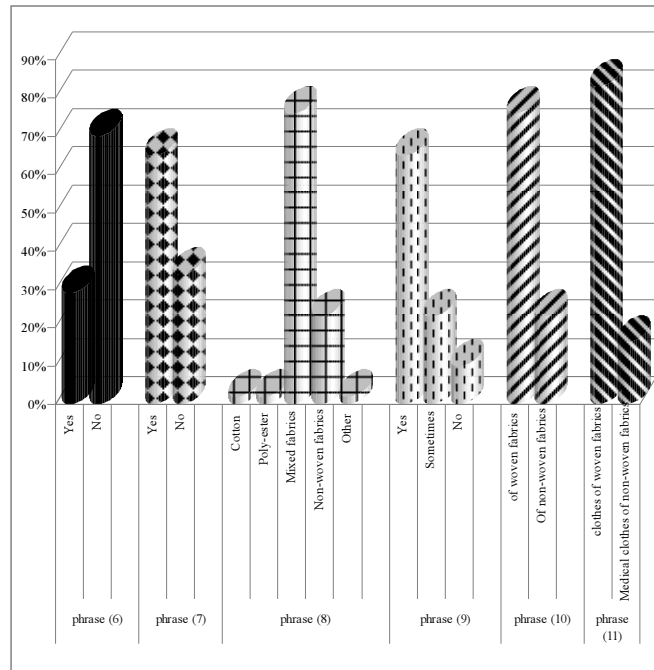


Figure (4) shows the percentages for phrases with the second axis in questionnaire (2)

## DISCUSSION

### Firstly, the criteria for selecting surgical operations rooms' clothes:

The study reached that there is no actual application of local or international criteria for selecting surgical operations rooms' clothes, especially in the public sector's hospitals as it shown by the results of table (1), that the whole study sample showed that specifications are followed when selecting surgical operations rooms' clothes, but this specification is a special specifications by the medical facility in line with the annual budget only, thus selected clothes are not sufficient degree to provide protection and safety for its users.



Data represented in table (2) prove these results, which show more than (50%) of the study sample are not agree with the current design of surgical operations rooms' clothes, and nearly (75%) of them referred to some harassments caused to them by these clothes at work.

These findings are consistent with **Hisham Ahmed's study in (2010)**,<sup>(5)</sup> which reached to the need to follow the standard tables of sizes for bodies depending on the General Authority for Standardization specifications, and the need to choose the material of surgical operations rooms' clothes and doing some tests to determine it's behaviors during the design and implementation of surgical operations rooms' clothes.

These results are also consistent with study **Ahmed Ramzy's study in (2011)**,<sup>(1)</sup> which reached to the need to define quality standards (aesthetic and functional performance quality) for the manufacture of medical garments in governmental and private hospitals, and provide technical files for designs of the proposed medical clothes.

#### **Secondly, functional performance for surgical operations rooms' clothes:**

The study found that durable gown which is used for the most in hospitals (the study sample) does not achieve the best functional performance, as (34 doctors) representing (53.97%) of the study sample that this gown always affects the movement of the doctor and his performance in the surgical operating room, while (46.03%) of the study sample showed that this gown affect their performance in Sometimes just like some gowns which can be obtained from the hospital supply source they are dealing with for the first time, and that the largest percentage of respondents, representing (44.44%) do not feel this comfort during wear this gown, and these results are shown in phrase No. (9) in the table, and this is what also consistent with the results of the two phrases numbers (5), (6) in Table (2), as well as the case for (65.45%) of the nurses (the study sample) who explained that the current design of the gown causes them some harassments at work, and does not provide them full comfort while working, and this is what confirms the results of the two phrases (7), (9) in Table (5), These findings are consistent with **Maha Talaat's study in (2009)**,<sup>(8)</sup> which concluded that the textile raw material (a mixture of cotton / viscose), followed by (100% cotton) achieved the best functional performance characteristics of fabrics used in the medical apparel industry.

#### **Thirdly, economic and aesthetic evaluation of surgical operations rooms' clothes:**

The results of the study also found that there are significant differences between surgical operations rooms' clothes manufacturers of woven and non woven fabrics, as it recorded by the results of the phrase number (11) in table No. (3), as there was agreement of more than (60%) of the study sample with preferring using disposable gown, because it is provide them health safety compared with durable gown, in addition to it's light weight which does not cause any burden to it's wearer, as it is characterized by easily wear and taking off, and this was confirmed also by results in phrase (6) in table (2), which showed that durable gown often causes some harassment at work, compared disposable gown, so they prefer to use as shown by phrase No. (11) in Table (3).

It is also noted by the phrase No. (2) in table (4) that, disposable gown's economic cost is very low compared to durable gown, and this result consistent with what came from the results of **Daniel B. Eisen's study in (2011)**,<sup>(3)</sup> which made it clear that the use of surgical garments of non-woven materials clearly contributed to the reduction of bacterial contamination rate, in addition to its economic cost.

On the other hand the results by phrase (11) in table (5) confirmed that more than (80%) of nurses surgical operating room prefer to use durable gown, so it can't suffer from repeated washing and sterilization, and the disposable gown often find it from light weight materials is insulating liquids which may contribute to transfer infection to its users, and this result is agree with the results of the study **CL Shelton et al's study in (2010)**,<sup>(2)</sup> in which the study sample expressed their preference for traditional medical clothing of woven fabrics, despite being one of the most important means of infection transmission and can cause some healthy risks.

From previous results it is clear that (low price, light weight materials, final disposal after the completion of operations, ease of wearing and taking of) are the most important reasons why the disposable gown is better than durable one, while (heavy materials, and take frequent washing and sterilization) are the most important reasons for preferring the durable gown.

#### **Conclusion:**

- There is no virtual applying of local or international standards and specifications when choosing surgical operating rooms' clothes.
- Enough satisfaction is not available on the current form of surgical operating rooms' gown.
- The durable gown is used more than the disposable gown in Egyptian hospitals.
- Economic cost of surgical operating rooms' clothes represent a huge burden for the budget of the health facility.
- The durable gown, which used more in Egyptian hospitals, does not achieve the better functional performance.

**Recommendations:**

- Medical facilities should follow local and international specifications and standards criteria when choosing surgical operating rooms' clothes.
- Trend towards the use of disposable surgical operating rooms' clothes in hospitals due to their high level of health safety and their low cost compared to durable surgical operating rooms' clothes.
- A lot of comparative studies should be applied on disposable and durable surgical operating rooms' clothes.
- Medical facilities should organize outreach programs required for some of those responsible for dealing with medical clothing, as well as those responsible for the its purchase.

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