

Survey Results of Medical Textiles in Hospitals



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Abstract

Medical textile products are significant part in the treatment and healing of patients. Surgeon, patient and visitors at hospital and clinical facility are increasingly benefitting the performance of medical textile products. This study is based on evaluating the results of survey, to determine the consumption of various medical textile products, in selected local hospitals in three different densely populated cities of Pakistan including Multan, Lahore, and Karachi. The survey results indicate the trend in the consumption of various medical textile products. These surveys were based on visiting selected hospitals and obtaining the medical textile product detail from the relevant sections of the hospitals.

Introduction

Historically, human has used pieces of textile clothing in healing the wound and preventing the release of blood injury. Life, health and hygiene are the superior desires of men, where medical textile can be viable contributor. Today, a large variety of medical textile products are known to serve the healing, healthcare, hygiene and surgical operations. Cotton and cellulosic fibers are the important source of medical textiles[1].

Surgical medical textile significantly used cotton fiber, and variety of medical textile products in surgical, healthcare and hygiene operations are composed of cotton and cellulosic fibers. Currently the consumption of medical textile products is growing in several regions. A number of market research reports are available that confirm the continuous growth in UK, France, Germany, Italy, USA, Asia Pacific, and the emerging market in China, Brazil, India etc. [2-5]. The volume of global medical textiles may be estimated to reach US \$15261 million by 2021 [2]. The important factors that contribute in the growth of medical textiles may be summarized in Figure 1. The growth and acceptability of medical textiles is based on the fact that life is precious, and the population is increasing. It is further enhanced by an increasing awareness of human population and regulating bodies to practice health and hygiene control. Number of aged people is increasing in advanced countries resulting from the improved individual care, facilities and public health schemes. For example, in 1980, the European population aged over 60 years was 22%, however, this population section increased to 40% in 2004 [6].



Figure 1: Important driving factors in the growth of medical textile consumption.

However, the data for a region or country of the world may be obtained based on the market size, volume, value, and price data. Surgical gown, mask, cap, gloves and blanket etc., and surgical hosiery are the common medical products consumed by hospitals and medical centers. Densely populated countries including China, India, Brazil, Pakistan and Bangladesh, require surgical and healthcare medical textiles in large quantities. Survey of hospital and medical center in Pakistan and Bangladesh indicated the significant consumption and market volume present for surgical and other medical textile products. The particular medical textiles

consumed in significant quantity include bed sheet, pillow, pillow cover, mosquito net, towel, quilt, gauze, cotton, surgical gown, surgical mask, and surgical cap, patience gown, and O.T maxi. The aim of this study is to see what market-based information is available on the variety of medical textile products consumed in local hospitals or medical center.

Materials and Method

The survey study was performed in three different cities of Pakistan including Multan, Lahore, and Karachi. It includes the public and private sector hospitals. The survey study is based on personal visit to medical facility and searching the required input, and available information on variety of medical textiles used through meeting the relevant section staff. The survey performed, and the description of the hospitals, are given in Table 1.

Table 1: Description of hospitals visited for medical textiles survey.

S.no	Survey Number	City Name	Hospital
1	Survey 1	Multan	Bakhtawar Amen Memorial Trust Hospital
2	Survey 2	Lahore	Jinnah Hospital
3	Survey 3 (7)	Karachi	Hospital 1: General Hospital Hospital 2: Heart Specialist Hospital Hospital 3: Kidney Specialist Hospital Hospital 4: Urology and Transplantation Hospital

These surveys were conducted at different locations; however, the important similarities may be realized including the following

1. All the hospitals surveyed were located in densely populated cities: Multan, Lahore, and Karachi.
2. The study was limited to surgical and healthcare textiles.
3. Significant number of medical textiles used was made of cellulosic fiber, and more importantly cotton fiber produced in Pakistan.
4. Most of the medical textile product studied were having woven and non- woven structure.
5. Necessary raw materials, fiber content, processing technology and equipment are available in local industries. However, research and development work will be required to produce particular product.
6. A significant volume of medical textile products is imported.
7. Implantable medical textiles are not covered in any of these surveys.

Results and Discussion

Survey 1

This survey was based in Bakhtawar Amen Memorial Trust Hospital, Multan. It is a private sector hospital established in 2006 by a group of industries having a constituent textile business. This hospital has healthcare facilities comprising 120 beds.

The various departments, where medical textile utilization is experienced, include the following facilities

1. General Medicine
2. ENT (Ear- Nose- Throat)
3. Gynecology
4. Skin diseases and burnt treatment
5. Eye Treatment

Survey 2

This survey was performed in Jinnah Hospital, Lahore. This is public sector hospital located at populated area. Number of patients is generally significantly higher relative to private sector hospital.

The various medical facilities to serve the patients in Jinnah Hospital were the same experienced in survey 1, and include the following

1. General Medicine
2. ENT (Ear- Nose- Throat)
3. Gynecology
4. Skin diseases and burnt treatment
5. Eye Treatment

Medical textile product used

A large number of medical textiles used were significantly comprising the cotton and cellulosic fibers in survey 1 (Bakhtawar Amen Memorial Trust Hospital), and survey 2 (Jinnah Hospital). The medical textile products used can be categorized as

- (i) Surgical protective clothing
- (ii) Healthcare textiles

Surgical protective clothing

These were observed as the following:

1. Surgical apron for general, and orthopedic surgery
2. Surgical gloves
3. Surgical mask (non- woven cellulosic)
4. Surgical caps (non- woven cotton)

Healthcare medical textiles

The healthcare medical textiles used in survey 1 and survey 2 hospitals include the following:

1. Cotton bandage
2. Cotton flock
3. Towels
4. Blanket
5. Pillow cases
6. Bed separator
7. Bed sheet

Observations made on the surgical mask and cap (non-woven cotton), and cotton gown are:

1. Non- woven cap and mask were having resin binder treatment for water repellency.
2. Surgical gown/ apron found to have fabric of an area density 250gsm.
3. Non- woven mask has several protective layers. Top and bottom layers were water repellent, and inner layer was for softness and skin protection.
4. Middle layer in surgical mask has perfuming anti-microbial finish to retard microbes.
5. Surgical cap, mask and gloves were made using non-woven textile with water and blood repellent properties to prevent cross- infection.

Importantly, the consumption of such medical textile products was indicated in the survey study of hospitals located in Dhaka, Bangladesh [7].

Survey 3

This survey reports the medical textile consumption in four different hospitals in Karachi [8]. It describes the similar surgical and healthcare medical textiles, however, it included the more specialized medical facility, in addition to general hospital, relative to those describe in survey 1 and survey 2. Moreover, monetary expense for the annual consumption of each product is estimated where possible.

The names of hospitals are held anonymous; and the four hospitals may be described as

1. Hospital 1: It is a general hospital with 600 bed capacity for patient.
2. Hospital 2: This is a specialist hospital for heart diseases. It may accommodate 120 patients with bed.
3. Hospital 3: This hospital has to serve kidney patient. The number of bed available is 100.

4. Hospital 4: This hospital is center for Urology and Transplantation. It may accommodate 500 patients on bed.

Hospital 3 and 4, being more specialized, were mainly using surgical medical textiles including surgical gown, can, and mask. Hospitals 1 and 2, however, were using greater variety of medical textiles including surgical clothing and healthcare textiles.

An increased variety and volume of medical textiles was used by hospital 1, being a general hospital with an increased capacity to accommodate 600 patients on bed. Surgical gown, mask, and cap, patient gown, OT towel apron, adult diapers, surgical kit, dignity sheet, drape and shoe cover were used in hospital 1. The volume of all these medical textiles was estimated Rupees 25.6994 million per annum. Except patient gown and OT towel, hospital 2 was using all the said medical textiles. The estimated volume of these medical textiles was Rupees 1.24998 million per annum. Hospital 3 and hospital 4, being more specialized, were using significantly smaller variety and volume of general medical textiles. Hospital 3 was mainly using surgical gown, cap and mask, dignity sheets, and shoe cover; that were estimated to an annual value of Rupees 0.32841 million. Pakistan is country with an increasing human population. Importantly, the increase in population aggravated with internal displacement of people from villages and town to major cities, particularly to Lahore and Karachi. The population rise more significant in such cities. Therefore, the consumption of medical textile products will continue to grow in future. The market volume of medical textile product in Pakistan was estimated, in recent past, to Rupees 100 million. There was significantly high volume of medical textile products annually imported reaching to Rupees 69.00 million. Therefore, there is an obvious capacity available for the research and development in the growth of medical textiles using the indigenous cotton fiber and cellulosic materials at the local industry level.

Conclusion

Medical textiles are increasingly required in treatment of patient, and healthcare of human life. Survey studies were based on the variety of medical textiles and their annual consumption in the selected hospitals, located in the densely populated cities of Pakistan including Lahore, Multan, and Karachi, indicated the market requirements. The local hospitals in public and private sector were found consuming significant quantity of healthcare and hygiene products, and non- implantable materials. The particular medical textiles consumed in significant quantity include bed sheet, pillow, pillow cover, towel, quilt, gauze, cotton, surgical gown, surgical mask, and surgical cap, patience gown, and O.T maxi. Therefore, there is an obvious opportunity for the development of cotton and cellulosic based medical textile products, particularly those used in surgical operations, disposable hygiene and healthcare. The processing technology and materials are available with fiber types and textile structure at the local industry level.

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