

## AN ASSESSMENT OF OPERATING ROOMS' PLANNING AT HOSPITALS IN TURKEY ACCORDING TO SPACE CHARACTERISTICS

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**Abstract:** Hospital planning needs a multi disciplinary study. Operating rooms are very important spaces in hospital planning. The aim of the study in the case of Turkish hospitals, is to find the number, quantity, and the equipment that are used in the operating rooms.

The rational planning of operating rooms associated with those factors below;

- Number, size, form and quality of the operating room
- Places which are directly or indirectly related to the operating room.
- Number, sufficiency and situation of the medical staff using the operating room.
- Sufficiency of technical equipment in the operating room.
- Material used in the operating room.

There is no planning team in Turkish hospitals or there is no continuity. The buildings of hospitals and operating rooms are frequently restored and physically changed after planning. As a result the operating room becomes different than what the planner had drafted, and the changes are primarily determined by the administrative staff. In Turkey, hospital engineering is not considered as a discipline, there are no planning teams and the existing ones are not permanent, which aggravates the situation.

In this research;

The number, size, form and quality of the operating rooms are analyzed and satisfaction of the users (health staff) is questioned.

Operating rooms in five hospitals in different regions of Turkey are analyzed in the methods defined above. There is a discussion on the data obtained and a rational planning for operating rooms.

### Introduction

Operating rooms are effective places in hospital planning. Operating rooms are to be planned rationally because they are directly related with health of the patient. It is so ordinary that the success rate in the operating rooms that have the properties needed by medical staff during the operation, which have the form and means which are big enough and numerous to facilitate working conditions, that have adequate

technical equipment and staff. In other words, operating room planning is closely related with health of patient and success of operation.

The rational planning of operating rooms depends on the following variables:

- Number, size, form and quality of the operating room.
- Places which are directly or indirectly related to the operating room.
- Number, sufficiency and situation of the medical staff using the operating room.
- Sufficiency of technical equipment in the operating room.
- Material used in the operating room.

In this study, the places related to the operating room, number, sufficiency and situation of medical staff and sufficiency of technical rigging and equipment are not mentioned.

The number, size (m<sup>2</sup>), form and quality of the operating rooms of five hospitals in Turkey are analyzed and users' pleasure is examined by questionnaires.

Because they are variable and use the place temporarily, the patients using the operating rooms can be said to be passive and the medical staff (doctor, nurse, etc) using the operating rooms continuously can be said to be active users. So user pleasure questionnaires were applied by medical staff.

Five hospitals that were examined in the study:

1. Government Hospital, Malatya, (MGH),
2. Beydağı Government Hospital, Malatya, (BGH),
3. Turgut Özal Medical Center, Malatya, (TOMC),
4. Yozgat Government Hospital (YGH), and
5. Private City Hospital of İzmir (PCH).

Hospital planning needs a multidisciplinary effort. Operating rooms are important spaces especially in hospital planning. In view of the variables effective in operating room planning, for the hospitals in Turkey.

Hospital buildings, so operating rooms, change physically due to various condition. After planning, operating room remains in the form the architect planned or it changes due to initiatives of the managing staff. In Turkey, the facts that hospital engineering does not seem to be a discipline, there is no planning group or it is discontinuous facilitate this process. Nevertheless, there is no hospital planning group, or if there is, it has no continuity at the hospitals in Turkey.

For this reason, hospitals or operating rooms have to be planned appropriate for the needs of the medical staff expressed as active users and for the standards.

Due to evaluations, in all of five hospitals examined in the study it was seemed that medical staff does not actively play a role in planning group, but in only Private City Hospital of İzmir, counseling of nurses is considered to be important.

### Space Characteristics

One of the important criteria in hospital planning is the space characteristics of the hospital which consist of number, size, form sufficiency and space quality.

#### a. Number

The capacity and groups served by the accompanying hospitals differ from one another. In contrast, it is seemed that the operating room is used frequently. Also, most clinics do not have operating rooms specialized in their profession fields. It is observed that the clinics other than cardiology and gynecology do not have their own operating rooms. Figure 1 illustrates the frequency of which operating rooms are used and Figure 2 illustrates possession of operating rooms specialized in accompanying departments. The number and sufficiency of the hospitals in evaluation were given in Figure 3.

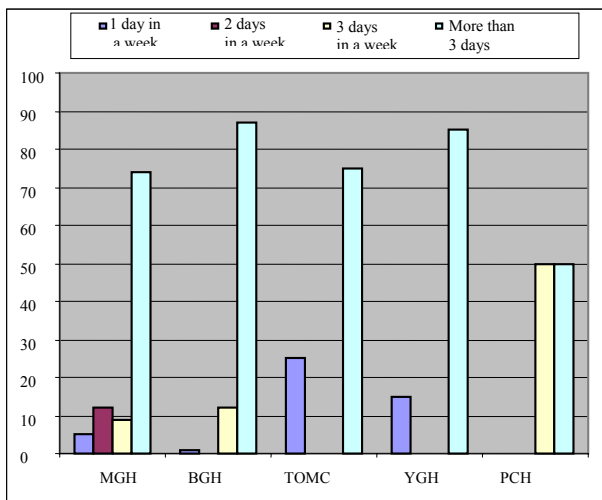


Figure 1: Frequency of operating room usage

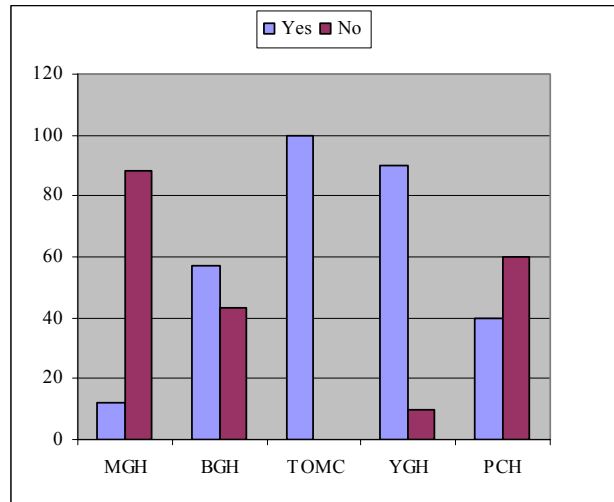


Figure 2: Possession of operating rooms specialized for accompanying departments

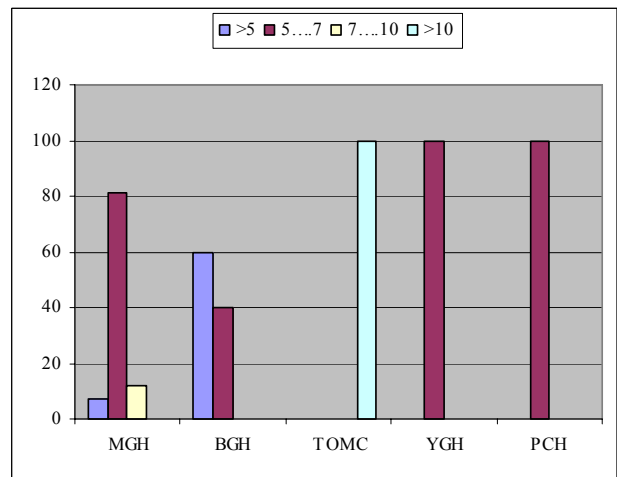


Figure 3: The distribution of number of operating rooms

#### b. Size

General surgical operating rooms must not be smaller than 30 m<sup>2</sup>. Ideal size for the surgical profession fields is 40-42 m<sup>2</sup>. For some cardiology surgical operations the area needed for an operating room can be 55-60 m<sup>2</sup>. Because neurosurgery, breast, cardiology, ophthalmology, otorhinolaryngology, gynecology and orthopedic surgery equipments differ from one another, such operating rooms must be distributed from others. For each hospital, number of operating rooms should be counted due to the social and demographic data and probable number of operations belonging to the environment it serves for. General agreement in order to compute operating rooms is the ratio of the total number of operations for one year to the number of operations to be done in one year of a hospital. The number of operations must be calculated by the ratio of multiplication of the bed numbers of the hospital, the ratio of full beds and the number of days in one year (365 days) to the multiplication of number of days that

the patient stays in hospital with the constant 100. In the hospital planning process, data such as health, population etc about the environment that the hospital serves for and the data if there is another health center around should be evaluated carefully. Because planning is a foresight, the fact that the data were vigorous would lead to the validity of forecast and also planning decision. In the hospitals in which planning is not made so comprehensively, it is unavoidable that sufficiency on the number, size and quality of operating rooms can not be obtained. In most of the hospitals in evaluation, it was seemed that sizes of operating rooms were in different incapaties and in inadequate numbers. Sizes, numbers and sufficiency of the hospitals in evaluation were given in Figures 4, 5 and 6.

Pleasure about the spaces for pre-operative and post-operative processes is also variable. The data about the pleasure of size of pre and post-operative places were given in Figures 7 and 8.

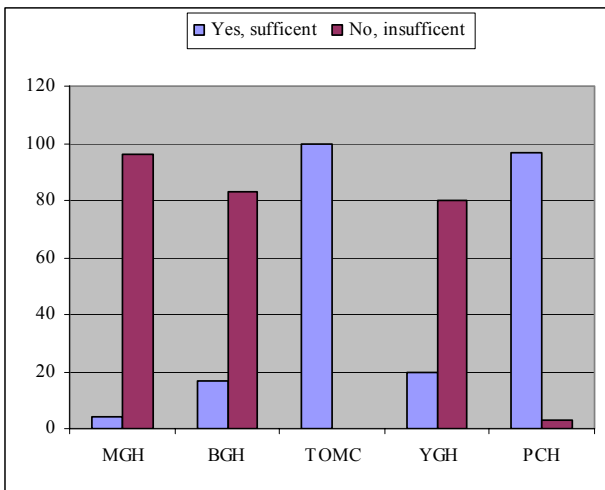


Figure 4: The ratio of sufficiency of sizes of operating rooms

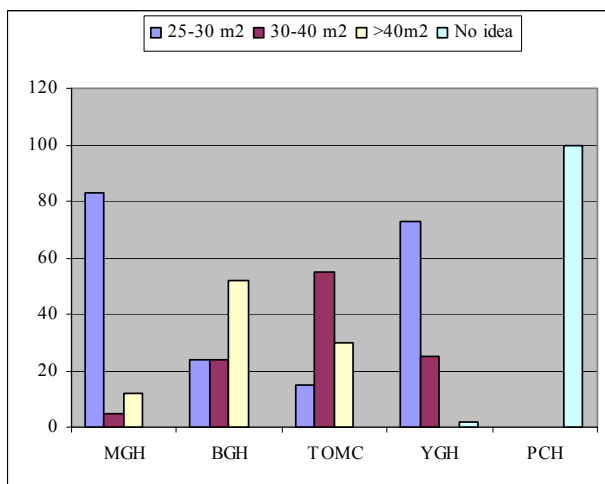


Figure 5: Sizes of operating rooms (m<sup>2</sup>)

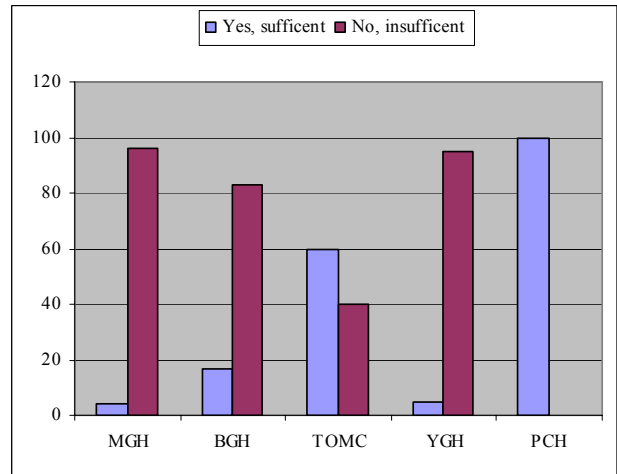


Figure 6: The ratio of sufficiency of number of operating rooms.

Figure 7: Sufficiency of size of pre-operative places

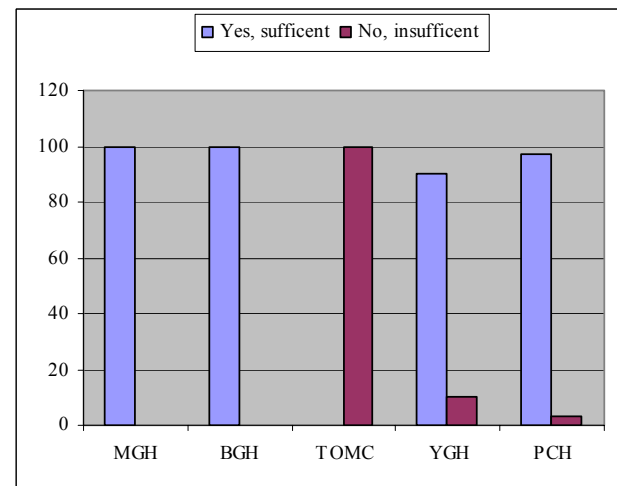
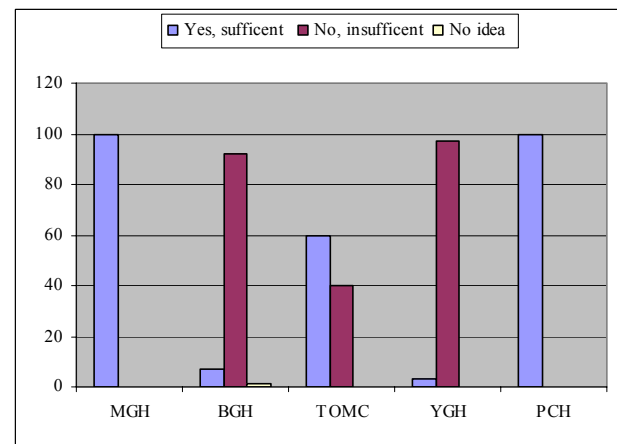


Figure 8: Sufficiency of size of post-operative places

**c. Form**

Although forms of operating rooms differ due to usage fields, they are generally square and rectangle. In the evaluation, it is seemed that square and rectangular shapes chosen were used variably and that rectangular

form was preferred to square form. Data about the forms of operating rooms and the users' pleasure are illustrated in Figures 9, 10 and 11.

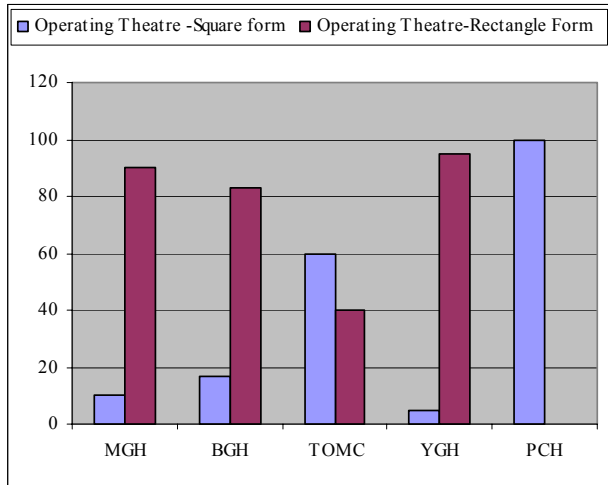


Figure 9: Form of the operating room

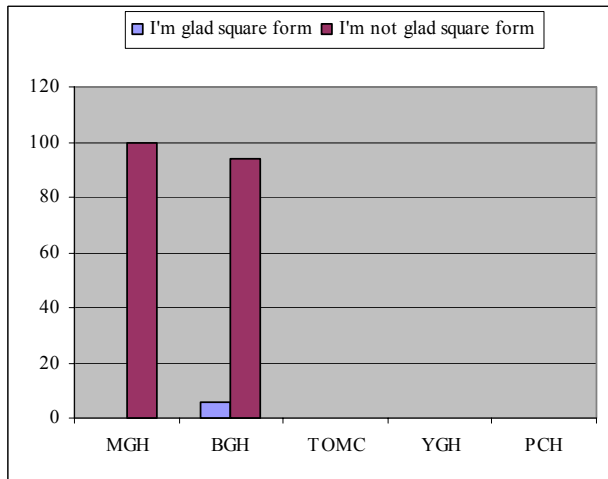
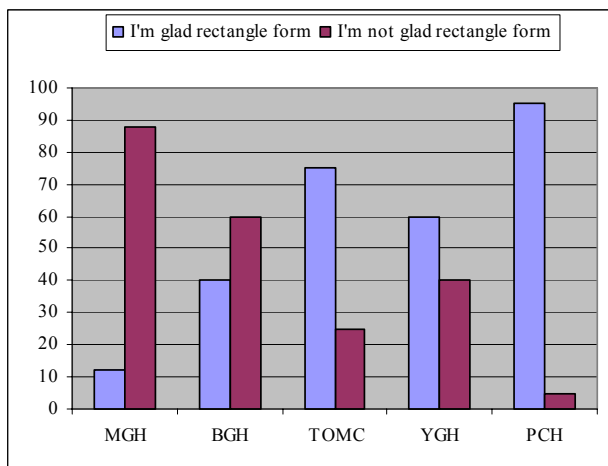
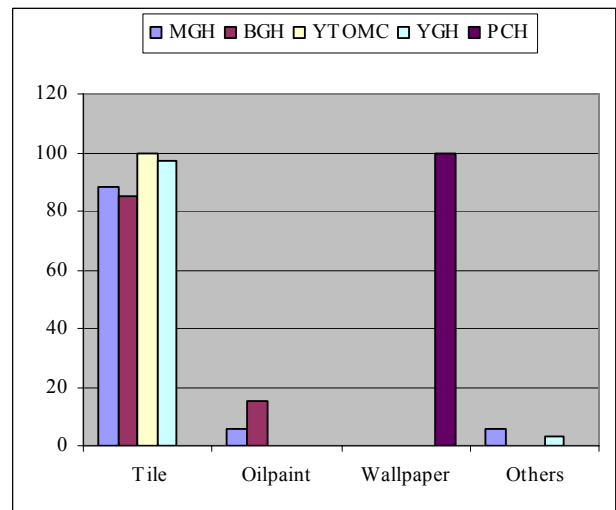


Figure 10: Pleasure about the square form

Figure 11: Pleasure about the rectangular form.



**d. Quality:**The wall covering materials of operating rooms have to be covered with relatively non-reflecting for light, strong, appropriate for hygiene and easily cleaned materials. Between the hospitals evaluated, only Private City Hospital of İzmir had used polishable and washable textile based wall paper. The most common wall materials are ceramic tile and then oil paint in other hospitals. The ratio of usage of the other materials is low. Dissatisfaction on the wall material was about that cleaning was difficult and there was no repair. The idea that wall materials are not cleaned enough has high frequency. In the hospitals with ceramic tile and oil paint, there are complaints that light is brightened. Making a slope off 3 degrees of the hospital walls towards the cleanest sites and curving the corners is a method that makes cleaning easy and inhibits bacterial growth. But in evaluations, the idea that enough attention is not given to this phenomenon, especially while porcelain using, is common. In addition, there is need for screening on the walls against electro-static interactions coming from outside on walls. So, it can be taken help from double side vinyl covered sandwich constructions containing bronze plaques. In our country there are methods and standards measuring electrostatic loading prepared in this manner. Because the medical staff taking part in the questionnaire did not participate in planning group, they could not help about choice of material related to the electrostatic loading on the walls and floor and about what was applied during



production. The materials used on the wall and the idea about these materials were given in Figures 12 and 13.

Figure 12: Wall materials used in hospitals

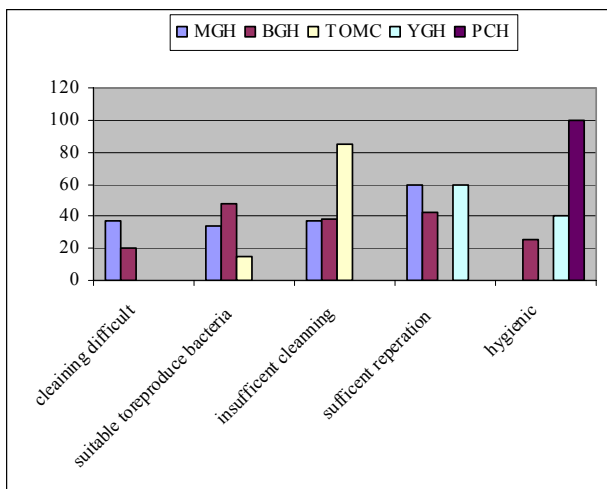
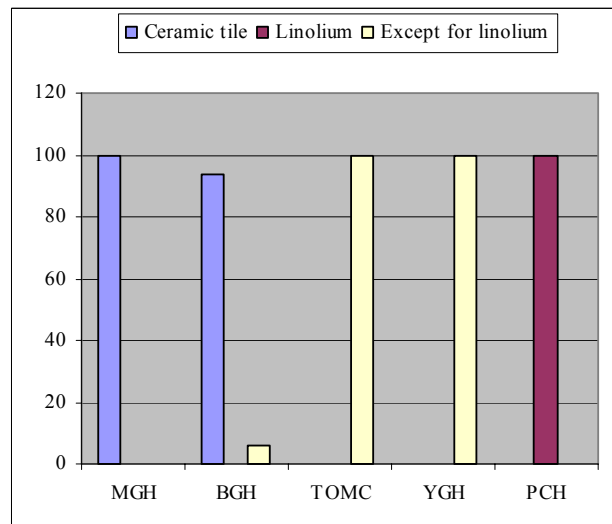
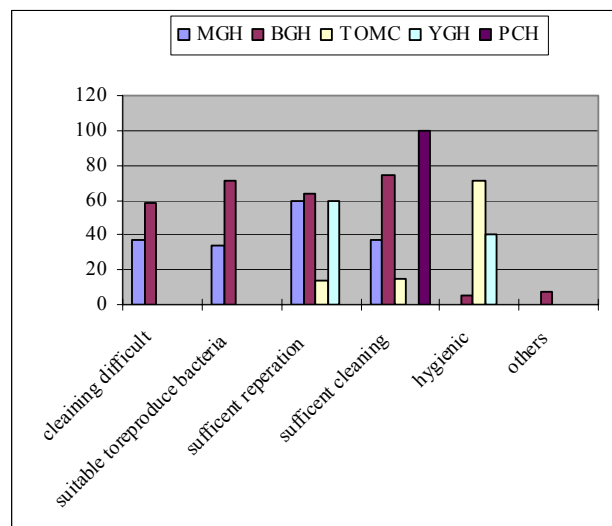


Figure 13: Ideas about the wall materials in hospitals

The floor covering materials at the hospitals have to respond some requirements. For instance, they have to be incorruptible due to water and disinfectants; as well as easily cleanable and durable. The person stepping over it for a long time must not feel tired, and must have the property that it does not make the person tired when stepped for a long time. Besides, they must not be slippy. The fact that floor material is durable, durable to breakage, cracks and scratches is the private requirement needed for hygienic conditions. At the same time the ability to flex when the weighs such as operating table etc are taken away and the resistance to fire are the properties looked for. PVC must be preferred as the material that has these properties. It is real that the bacterial growth on horizontal surfaces is greater than on vertical surfaces in hospitals. In addition, floor construction used on the ground and choice of the material that is used on shoes of the staff are needed to have the property to decrease the loud. In the evaluation, it is seemed that materials which were slippy, were not resistant to include microbes because of its adjunctions and caused noise are used as well as PVC based floor material. The materials used in operating rooms and the pleasure degrees were given in Figures 14 and 15. Displeasure in floor material used generally is about the facts that there is no repair, no adequate cleaning and no resistance to bacteria l growth.



Figures 14: The floor covering material of the operating rooms



Figures 15: The opinions about the floor covering material

### Evaluations

When the users were asked their opinion about operating room it is observed that displeasure results from the wrong decisions made in the planning stage of hospital. In the hospitals with low number and frequency of operations, doctors have said that they did a few operations because they could not find a place. In the situation that there are enough places, deficiency of technical staff and equipment comes the second. The answers given by the users for this question are generally negative. There are many who find technical staff and equipment, number and size of the space, ventilation, heating and lightening deficient. The user number of which has to be paid attention say that floor and wall material are not practical and standard. While a group of user does not think that the operating room is clean and safe the other group talks about deficiency of

knowledge and guidance. The thoughts of users about their operating rooms were illustrated in Figure 16.

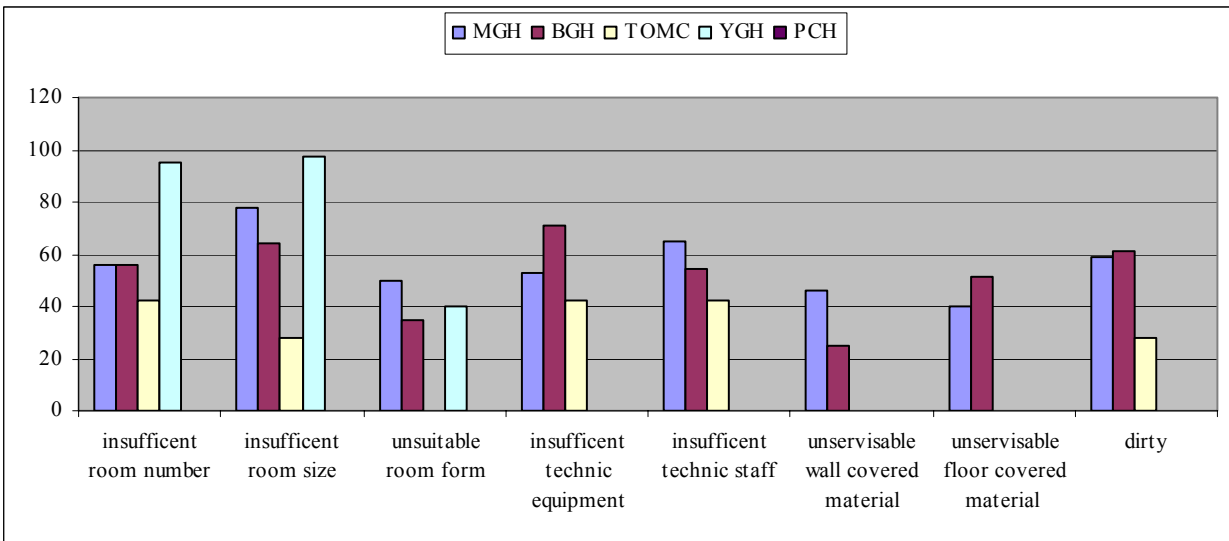


Figure 16: Opinions of the users about operating rooms

**Results**

Hospital planning needs a multidisciplinary work effort. Operating rooms are important especially in hospital planning. In study, in view of variables effective in operating room planning, the numerical values and users' pleasure about the number, size, form and quality (materials and satisfactions) used in operating rooms were questionnaired in the hospitals of Turkey.

The fact that there is no hospital planning group, hospital planning does not seem to be a discipline cause a failure in standardizing the number, size and material choices of operating rooms in optimal values.

The studies showed that user pleasure is mostly not provided in sample hospitals.