

Ergonomic Standards of Furniture Design in Dental Centers

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Summary:

Dental specialization is one of the corner stones in treating oral and dental disease and gums. The design of furniture reflects the type of treatment to be provided. In the field study of some dental centers in Egypt, there was a lack of compatibility between the space needed for furniture and the ergonomic movement within it, such lack of space is not commensurate with the areas required for the rooms for diagnosis and treatment of teeth causing failure to achieve the best use of the provided space to accommodate the needs of the clinic making it almost impossible to achieve the functions of treatment comfortably for both doctors and patients. In addition, the inadequacy of proportionality in space between each of the dental unit and the tools closets gives the impression of crowding, ugliness and unprofessionalism.

The problem of research is that the most popular and private dental centers lack standards and Ergonomic requirements to design furniture in treatment rooms, thus they fail provide adequate comfort to both the doctor and the patient. The internal space of the functional area is not consistent with the functional requirements of those rooms.

The aim of the research is to introduce the Ergonomic Standards for furniture design according to their functions in order to achieve the proper furnishing in them which ensures the comfort and safety of centers. Also to focus on some companies which apply the Ergonomic standards in furniture to be used in Egyptian centers.

Research hypotheses: There are Ergonomic Standards that can be applied in interior design and furnishing of the dental centers according to the type of furniture units in these centers and according to the specialties in them to achieve the best outcome ensuring an easier working area and a pleasant environment. To the surprise of some there are some furniture manufacturers that already apply those standards to furniture and all ready to be used by the treatment rooms in the dental centers.

The importance of the research is to clarify the orthogonal criteria for the design of treatment room furniture in the dental centers regarding both the doctor's chair, the patient's chair (dental unit) and storage units providing solutions that can be utilized in terms of traffic corridors and the types of furniture suitable for treatment rooms and diagnosis in dental centers.

The research follows the descriptive analytical approach.

Search Results

1. The diagnostic and treatment room consists of an entrance area, the wall opposite to the doorway, the right, the left wall, the center area or the center of the room.

2. Some necessary criteria should be put in consideration in the dentistry centers design:

A. The dimensions of the diagnostic and dental treatment room are 340:350 cm in width minimum for the chamber, if there is a storage unit behind the patient it becomes a minimum 390: 400 cm and If the storage units are in the left and right sides of the patient's chair (dental unit), the width of the room is at least 350:370 cm .

B. The minimum possible area of the diagnosis and treatment area in the center of the room is a rectangle with 350 cm length and 320 cm width to allow putting the dental unit and the doctor's chair adequately and in case of the presence of three storage units then each one is to be located at each wall except the wall opposite of the entrance meaning that a rectangle of minimum width is 380 cm is needed instead of 320 cm is to be needed then. The operation rooms (requiring general anesthesia) is similar to the regular treatment rooms in dimensions and it is preferred to have two entries on at the wall behind the dental unit (patient's chair at the left side and another at the right side of that wall.

C. The area in the center of the treatment room is for the dental unit (patient's chair): the chair is designed to be comfortable for the patient during diagnosis or treatment, multimode, with a headrest, and may have arms up and down, and the position of the Chair can be changed using hydraulic piston. Upholstery is simple and with a cover that is easy to clean.

D. There are some standards for the patient's chair spaces and specifications such as: The distance allocated to the patient's chair ranges between 135 cm and 234 cm according to the type of chair that used and the possibilities for its operation .

E. The minimum distance between the back of the patient's chair and the face of the storage units behind it or the wall is 120 cm because it is the area of the doctor's movement. The distance between the patient's chair axis and the left wall of the doctor and patient is not less than 126 cm. The distance between the end of the chair at the foot place and the opposite wall is not less than 85 cm.

F. Dental unit (Patient's chair) Attachments: Some of the tools may prove helpful in treatment around the patient's chair including a ground control center that controls the height and angles of the dental unit. The light is at the right of the patient's chair and sits above the center of it and a screen sits above at the left of the patient' chair.

G. The doctor's chair is usually at the right of the patient' head and the work area between 10 and 12 O'clock and his assistant chair should be at the left of the patient. The front base of the doctor's chair takes the shape of a sloping waterfall.

J. The left wall area of the doorway and patient's chair contains: a small, mobile storage unit with some tools used during treatment, including Ultrasonic device, wall-sensitive images and radiography is hanged on the wall and there are two storage units one is hanged on at the top of the wall and the other one is based on the ground.

3-some of the international companies that produce dental furniture has been brought to their attention that the best way to design fully functional furniture is to apply the Ergonomic standards in the design and implementation of dental chair that relates to the movement conditions during work in order to avoid over stressing the doctor' which leads to early retirement. In order to avoid this, there is increased interest in the production of various chairs to fit the chair

function, which achieves the comfort of the doctor and the patient and to serve infection control.

4. Furniture products of the chairs of dental doctors and patients have been widely distributed with varied forms and with high potential that meet both doctor's and patient's convenience .

5. The function of the storage units for the furnishing of diagnostic and treatment rooms is varied, including the mobile, upper and lower constant and the inside of the wall.

6. A very inadequate furnishing in most of the state dental centers in Egypt in proportion to those standards is required, thus needs to put in considerations applying the criteria of dental centers interior design when furnishing such centers.

Discussion of Results:

The search results showed severe deficiencies in application of Ergonomic criteria of movement around furniture in the diagnostic and treatment rooms in many dentistry centers. This requires the application of these criteria for specified areas of patient' Chair and doctor's chair to ensure the patient's comfort , the doctor's comfort and lack of doctor's occupational diseases.

As the study showed some increased interest in dentist' chair design as dental function cause high stresses and occupational hazards leading to early retirement.

A lot of producer companies of dental centers furniture took care of application of the required ergonomic criteria in the design and implementation of doctor's chairs which achieve comfort for doctors and patients.

There are also some specific ergonomic standards for the different storage units, which are applied when determining the storage units required to furnishing dental center rooms.

This ensures easy access and handling of those areas and puts in consideration their respective functions. The study revealed the variation of storage units needed to furnish the diagnostic and treatment rooms such as the mobile unit , the upper and lower constant units , and the fixed inside the wall . They are also varied between drawers unit, doors unit or drawers and doors unit that are recommended to be used when furnishing the governmental dental centers.

Recommendations:

1- The necessity of commitment in the centers of the Ministry of Health to apply the considerations of ergonomic criteria while making the design and furnishing the inner space of the state dental centers.

2- Emphasize the preventive control of the private dentistry centers to follow the criteria of ergonomic design of furniture which ensures comfort and safety of the specialist movement and best functional performance during the treatment.

3- Take the necessary procedures to provide comfort to the patients while they are in the dentistry centers by providing comfortable chairs that are suitable for treatment or waiting.

4- Emphasize the technological development of governmental dentistry centers and providing them with equipment and machinery which facilitates work.

5- Emphasize the importance of providing storage units, whether medication or equipment or devices to maintain the materials that are wasted due to poor storage.

6- Providing custom installations of the first step to fix dentistry governmental centers that are selected on the basis of a correct design.

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