

Implementation of Color in the Interior Design of the Pharmacy Laboratory through a Total Ergonomics Approach provides Comfort and Increases Focus in Work

Made Ida Mulyati¹, Levi Anatolia²

Institut Seni Indonesia Denpasar, Indonesia¹, Universidade da Paz, Timor-Leste²

Email: idagunawan2018@gmail.com, bebretelevi@yahoo.com

ABSTRACT

Interior design is not only limited to arranging the room to make it look attractive. There are fundamental reasons why we need interior design, which must be able to create a room that is harmonious, aesthetic, meets the demands of its activities and the psychological demands of its community so that the room is functional. The furniture and equipment facilities of the pharmaceutical laboratory have been standardized. For color standardization does not yet exist, it is necessary to analyze the color in the interior design of the pharmaceutical laboratory through a total ergonomics approach to be able to provide comfort and focus for staff. The method used is descriptive analysis method. Color psychology is a theory of color studies related to human psychology. To balance the room, it must also be considered the appropriate color implemented in interior design to achieve balance and harmony in the room. Designing the interior of a pharmaceutical laboratory is not just about implementing the colors we like, but must have sufficient meaning so that it can have an impact on behavior, mood, cognition, focus, and general association. For this reason, it is considered important to study the total Ergonomics approach in order to get the optimal improvement solution. The results of the analysis obtained colors that are suitable to be applied to the interior of the pharmaceutical laboratory include neutral colors of white, light gray, and may slightly apply black as an accent. Besides there are several companion colors to be combined with neutral colors including white heron, crystalline, windmill wings, golden straw, thunder. By implementing these colors, it can provide comfort and focus for laboratory staff to improve performance and productivity.

Keywords: color implementation, interior design, total ergonomics approach, comfort, focus, color psychology, performance enhancement, productivity, neutral colors, white heron, crystalline, windmill wings, golden straw, thunder

Introduction

Interior design is based on the demands of the activities and the community. This is very necessary in providing comfort and increasing the focus of the community in doing work. By providing comfort and focus, it can improve performance and productivity. One of them is the interior design of a pharmaceutical laboratory with the concept of Good Laboratory Practice (GLP).

Good Laboratory Practice (GLP) is a quality management system applied to pharmaceutical testing laboratories. The system serves to ensure that the laboratory testing results are more valid and accurate so that the results are more accountable. GLP covers all aspects of study implementation, planning, execution, monitoring, recording, and reporting results. Here are some principles of the GLP system, including:

1. Organization and Management of pharmaceutical testing laboratories must have a clear organizational structure, with good roles and responsibilities so that activities can run well.
2. Laboratory staff personnel must be qualified and adequately trained and educated.
3. Laboratory facilities must meet standards of cleanliness, safety and comfort so that staff can focus more on working in the laboratory room.
4. All equipment must be calibrated and maintained regularly to provide accurate results.

Implementation of Color in the Interior Design of the Pharmacy Laboratory through a Total Ergonomics Approach provides Comfort and Increases Focus in Work

5. Testing Procedures All testing methods are carried out in a structured manner so as to produce an accurate report.

To answer the principles of the GLP system in number 3, namely laboratory facilities must meet hygiene, safety and comfort standards so that staff are more focused on working in the room, one of which is the implementation of color on space-forming elements (floors, walls and ceilings), complementary elements of space-forming (doors, windows and ventilation) and color selection of facilities (furniture and laboratory equipment) must be carefully considered. With the right color implementation in the interior design of the pharmacy laboratory, it can provide comfort and increase the focus of staff at work.

By providing comfort and increasing the focus of staff in working in the laboratory space, the GLP system includes:

1. During the research phase, and toxicological testing, pharmacokinetic studies, and effectiveness evaluation can minimize the error rate so as to produce valid and reliable data.
2. Clinical trials can prove that the results obtained can be accounted for later;
3. Registration and approval of drug distribution license applications to regulatory agencies, such as BPOM, can facilitate the process of applying for distribution licenses because the results recorded are more accurate and valid.
4. Increase consumer confidence in drug manufacturers for assuring consumers that the products are safe and effective.

For this reason, it is important to study the total Ergonomics approach to obtain optimal improvement solutions, which are related to the appropriate color psychology implemented in the interior of the pharmaceutical laboratory to provide comfort and increase staff focus in working on the interior of the pharmaceutical laboratory.

The total ergonomics approach is the best effort in improving working conditions (humans, tools and the environment) to be optimal with the least possible impact. The minimum impact can be done with systemic, holistic, interdisciplinary and participatory. The SHIP approach is a comprehensive improvement of all aspects of ergonomics in the design process from upstream to downstream in a sustainable and integrated manner. One of them is creating a pharmaceutical laboratory interior design by implementing appropriate colors to create comfortable environmental conditions and provide good focus for staff working in the room.

Research Methods

The method used in this writing is the descriptive analysis method. Descriptive analysis is a research method by collecting actual data, then the data is compiled, processed and analyzed to be able to provide an overview of the existing problems (Haryoko, 2020).

Results and Discussion

Interior design is not just about arranging a room to make it look attractive. There are fundamental reasons why we need interior design. We must realize that every decision in designing a room has a specific purpose.

Here are some of the main functions of interior design:

1. Creating a room that is harmonious and pleasing to the eye.

Interior design helps in arranging the elements in a room to match with each other. This creates balance and harmony in the room. To balance the room, you must also think about the appropriate color implemented in the interior design to achieve balance and harmony in the

room.

2. Giving Aesthetic Value to the Space

Interior design maximizes the beauty of the room, making it not only functional but also aesthetic. Aesthetic value can be achieved one of them by implementing colors that are in accordance with the psychology of the demands of the wearer's community so that it can present a comfortable and pleasant room. A well-designed room can increase productivity and work enthusiasm for the community working in it. So it can be concluded that humans and the environment are basically an inseparable unity because they interact with each other (Altaman, 1987).

A wise and coherent selection of colors in interior design can provide an atmosphere that matches the concept and function of the room. Color is also used to direct attention and distinguish the function of the area in the room.

Color in Interior Design plays a central role in creating the atmosphere and mood in a room. Soft colors such as pastels or neutrals tend to give a calm and relaxing impression, while bright and sharp colors such as red or yellow can provide energy and vibrancy.

For this reason, the science of color psychology studies must be understood by interior designers before designing interior designs. In this case, we will discuss the right color study to be implemented in the interior design of the pharmaceutical laboratory.

1. Color Study

According to Pthagoras' law (around 580-500 BC), every object emits particles. With these particles we can see light, with the light so that we can see the color of the object

2. The Effect of Color Psychology on Pharmaceutical Laboratory Staff

Color psychology is a theory of color studies related to human psychology. The color that is implemented in a pharmaceutical laboratory interior design is not just implementing colors that we like, but must have sufficient meaning so that it can have an impact on behavior, mood, cognition, focus, and general association (

The effect of color on the psychology of space users according to color psychology experts as follows: (Mulyati & Exposto, 2023)

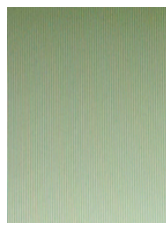
1. Psychology of White and Light Ash as Neutral Colors

White and light gray are neutral colors, but can also be cold and harsh. Based on psychology, the influence of white color includes the symbol of purity, innocence, giving a clean impression. While psychology, the influence of light gray color includes strong, hard and dampen emotions. White and light gray colors applied to interiors such as walls, floors, ceilings, doors, windows, vents and furniture make the impression that the space looks wider. Besides that, it can give the impression of clean, fresh, and neat. The negative associations of white and light gray are boring, cold, empty, isolated, and stubborn. However, these associations will not appear if we combine with colors such as *white heron*, *crystalline*, *windmill wings*, *golden straw*, *thunder* which are suitable for implementation in the interior of the pharmaceutical laboratory.

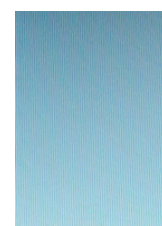
Implementation of Color in the Interior Design of the Pharmacy Laboratory through a Total Ergonomics Approach provides Comfort and Increases Focus in Work



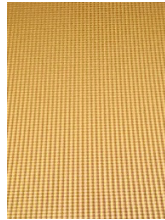
White Cream



Crystalline



Windmill wings



Golden Straw



Thunder

2. Green Color (*Crystalline* or Sage Green)

Green color as a symbol of the influence of nature and a soothing environment. Paul Brunton said that green is the color of nature that is comforting, calm, soothing, cheerful, affectionate, relieves stress so it is very suitable to be implemented in the interior design of pharmaceutical laboratories, but still should be combined with white, *white hiron* and other colors that can reflect a clean impression.

3. Light Yellow Color Psychology (*White Cream*)

Light yellow or leaning towards white cream is a bright, calming color. The characteristics of yellow and its effect on psychology are that it affects strong feelings, evokes mood. energize, and give a clean impression. The light yellow color that can arouse the mood, give energy is very suitable to be implemented into the interior of the pharmaceutical laboratory because it can provide enthusiasm for its staff in working so that the results of their work in compounding drugs are more productive. While the impression of clean to always remind laboratory staff to work must be skilled so that it can minimize or eliminate materials that fall.



Figure 1. Implementation of a combination of white, light gray, *white cream* colors in a pharmaceutical laboratory and accompanied by a little black as an accent .

1. Blue Color Psychology (*Windmill wings*)

Based on *color psychology*, blue gives calmness, gives the effect of peace, security, order, and stability. But if applied too dominantly it will give the effect of sadness, loneliness,

sadness and turmoil. The blue color (*Windmill wings*) in accordance with its portion in the interior of the pharmaceutical laboratory will have a positive effect on the psychology of pharmaceutical laboratory staff who can provide a sense of calm, peaceful order and stability in working so that work is more comfortable and more focused.



Figure 2. White wall color, combined with the color of the *Thunder* frame, while the door is a combination of the color of the *Thunder* and *Windmill Wings*



Figure 3. Combination of wall color with thunder color, floor selected *Windmill Wings* and furniture white color

2. Brown Color Psychology (*Golden Straw*)

Based on color psychology, cream brown is a natural color that gives psychological effects of strength, resilience, safety, warmth. But just don't implement it too dominantly, it will bring negative effects such as loneliness, sadness, isolation, and emptiness.



Figure 4. The implementation of a combination of *Golden Straw*, white, light gray and black accents on the ceiling makes the interior of the pharmaceutical laboratory more attractive.

3. *Orange* Color Psychology Leads to Yellowish

Based on *color psychology*, the color Orange gives the influence of emotional energy that must be shared, such as passion for work and warmth. With a room atmosphere that provides

Implementation of Color in the Interior Design of the Pharmacy Laboratory through a Total Ergonomics Approach provides Comfort and Increases Focus in Work
work passion can increase comfort and focus for staff working in the pharmaceutical laboratory. Besides that, the orange color can also provide warmth which greatly supports the work passion so as not to get tired quickly. Fatigue is a condition of decreased work capacity and endurance, where workers cannot perform work activities optimally resulting in decreased performance (Susihono et al., 2017).



Figure 5. The implementation of a combination of white, light gray, white cream colors in the pharmaceutical laboratory and accompanied by a little orange as an accent gives the impression of warmth.

The effect of implementing appropriate colors in the interior design of the pharmaceutical laboratory has a positive effect on the comfort and focus of the work of pharmaceutical laboratory staff, so it is better if in designing the interior design of pharmaceutical laboratories and other laboratories or tourisms must think about the suitability of the implementation of the applied colors. By providing comfort and focus on work so as to produce a high work ethic and productivity, as well as empathizing with the health of staff in doing work.

The habit of working in a comfortable and safe environment must be conditioned from an early age in using the pharmaceutical laboratory space. For this reason, there is a need for standardization of pharmaceutical laboratory interior design which later must be used as a reference in the development of pharmaceutical laboratory interior design. One of them includes the standardization of colors used in designing pharmaceutical laboratory interiors.

In addition to the implementation of appropriate colors for the interior of the pharmaceutical laboratory, it is also important to consider the suitability of the color for the information and safety signs required in the design of the pharmaceutical laboratory. Signs must be clear, easy to understand and the writing must be in English (or the language most widely used in the laboratory). The writing must be in a clear font and must use the right color scheme for easy reading, in accordance with the Minister of Manpower Regulation number 15 of 2008 concerning First Aid in Accidents.

A. Application of Color in Laboratory Signs

The application of colors on laboratory signs follows certain color code regulations that have become a requirement for an emergency procedure in a pharmaceutical laboratory. Like color: (The Sherwin-Williams, 2018).

1. Orange is usually used to indicate dangerous parts of machinery or equipment that have high temperatures that can cause scratches, cuts, collisions, electric shocks or injury to workers.

For example, orange is used in the background of an OHS warning sign, danger signs on machine doors and sharp edges on work tools.

2. Yellow signifies a physical hazard warning caution. Black stripes can be used to draw attention from workers.

Yellow is used in caution signs, railings, and storage for acids.

3. Blue indicates caution and is used to indicate equipment that should not be used. For example, blue is used on command signs, electrical controllers, and others.
4. Green indicates the location of safety equipment such as first aid kits. The use of green can also be seen in *eyewash*, *eyeshower*, and *emergency exit routes*.
5. Black and white: the combination of these 2 colors is used to indicate traffic and housekeeping signs. Stripes or squares are often used for these two colors. Examples of the use of black and white can be seen on stairs, or signage.



Figure 6. Fire extinguishers and hydrants



Figure 7. Emergency eyewash green color

Conclusion

From the results of the analysis obtained colors that are suitable to be applied to the interior of the pharmaceutical laboratory include neutral colors of white, light gray, and may slightly apply black as an accent. Besides there are several companion colors to be combined with neutral colors including white heron, crystalline, windmill wings, golden straw, thunder. By implementing these colors, it can provide comfort and focus for laboratory staff to improve performance and productivity.

Reference

- Altaman, I. (1987). *Handbook of Environmental Psychology (Volume I)*. Canada. John Wiley & Sons, Inc.
- Fitri, K. A., Rhomadhoni, M. N., Sunaryo, M., & Ayu, F. (2022). Evaluation of the Implementation of First Aid in Accidents (P3k) at Kalimas Port Surabaya (According to the Regulation of the Minister of Manpower and Transmigration of the Republic of Indonesia No. 15 of 2008 concerning First Aid in Accidents in the Workplace). *Scientific Journal of Wahana Pendidikan*, 8(12), 155-165.
- Haryoko, S. (2020). *Qualitative Research Data Analysis (Concepts, Techniques, & Analysis Procedures)*. Sapto Haryoko.
- Mulyati, M. I., & Exposto, L. A. S. M. (2023). Color Selection Study Of Children's Outpatient Clinic Interior Related To Patient Stress Level. *Asian Journal of Healthy and Science*, 2(5), 225-231.
- Susihono, W., Adiputra, N., Tirtayasa, K., & Sutjana, I. D. P. (2017). Participatory Ergonomics Intervention to Reduce Fatigue through Ladle-kowi Redesign. *Indonesian Public Health Media*, 13(1), 80-90.

Copyright Holder:

Made Ida Mulyati, Levi Anatolia (2025)

First Publication Right:

Journal of Health Science

This article is licensed under:

