

البحث رقم (١٠)

The Effect of Color on Human Psychological Health in Interior Design

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ملخص البحث:

يعتبر التصميم الداخلي عملية معقدة يجب أن تتعامل مع مختلف الخطوات والمراحل من تطوير المفهوم إلى تحقيق التصميم وإنهائه، وتجسيد الجمال، والتصميمات الموجهة نحو الجودة أو الموجهة للعملاء. تؤثر عوامل مختلفة على تصميمات العمارة الداخلية لمساحات محددة مع خيارات محددة، حيث يعد اللون أحد عوامل الجودة الأساسية التي تهدف إلى تحسين التصميم الداخلي المحقق. غالبًا ما تمت دراسة الطبيعة المعقدة للألوان وتأثيرها على الفن والثقافة وعلم النفس للإنسان في العديد من الأبحاث. يعتبر اللون هو الجودة الأساسية لإدراكنا البصري، حيث ان هناك العديد من النظريات والافتراضات الحاسمة المتعلقة بالراحة الجمالية والبصرية التي توفرها الألوان، وإبراز تأثيرها على النفس البشرية. هذه الدراسة البحثية لها دوافع لمعالجة أهمية الألوان في التصميم الداخلي. يحتوي هذا البحث بعض طرق التعامل مع المباني السكنية، ولكن أيضًا مع المباني العامة مثل المؤسسات الإدارية أو المستشفيات أو التعليمية التي لها تأثير مباشر مع البشر. يتم تحليل ودراسة أهمية استخدام ألوان محددة في مناطق الليل والنهار في المناطق السكنية لتعزيز رؤية الإنسان وتأثيره على الإنسان. التجارب التي لا بد أن تسلط الضوء على هذه المعاني قد أظهرت تأثيرات حاسمة فيما يتعلق بجوانب مختلفة من حياة الإنسان تمت دراستها وتحليلها. بناءً على هذه التحليلات، يتم استخلاص النتائج من خلال التنفيذ الحاسم للألوان في التصميم الداخلي. تم تحليل تأثيرها على الإنتاجية، وتعافي المرضى في المستشفيات، وكفاءة عمل الطلاب في المدارس لمناقشة جميع جوانب الألوان وتأثيراتها النفسية. الهدف من هذه الدراسة هو تحليل تأثيرات الألوان المستخدمة في التصميم الداخلي مع مناطق الإقامة أو الأماكن العامة المقابلة.

Abstract:

Interior design is considered to be a complex process that has to deal with various steps and stages from concept development to design realization and design finalization, aesthetics, and quality-oriented or customer-oriented designs. Various factors affect the designs of the interior architecture of specific spaces with specific options and upgrades. One of the basic quality factors that are meant to enhance and perish the realized interior design is color. The complex nature of colors and their impact on art, culture, and psychology of human beings has often been studied in various researches. Color is considered to be the fundamental quality of our visual perception. There are various conclusive theories and assumptions related to the esthetic comfort provided by the colors, and highlighting their effect on the human psyche. This research study has motives to address the importance of colors in interior design. This has everything to deal with residence buildings, but also with public buildings such as administrative, hospital, or educational institutions that have direct influence and takeaway with humans. The importance of using specific colors in day and night zones of residential areas is analyzed and studied to further enhance the vision of the human being and its impact on humans. The experiments that are bound to highlight these meanings have shown conclusive effects regarding various aspects of human life are studied and analyzed. Based on these analyses, conclusions are drawn with the decisive implementation of colors in interior designing. Their effects on productivity, patients' recovery in hospitals, and efficiency of student work in schools have been analyzed to discuss all aspects of colors and their psychological impacts. The goal of this study is to analyze the effects of colors used in interior designing with corresponding areas of residence or public places.

1. Introduction

Discussing the roles of architecture and its implications on the human being is to provide built environments that sustain the occupants' psychological well-being. This has direct impacts on human psychology and has various roles in the life of human beings. People tend to be more attracted to colors and interior designs that suit their tastes and align with their motives. This role of interior designing is made even more important because, in modern society, more than seventy percent of a person's life and his/her time is spent indoors (Al-Akkam, 2013). Interior design has considerable importance and various other involved factors that affect the users of the space, in various functional, esthetic, and psychological means. When it comes to discussing the interior of a space, colors are an integral part of it and have serious implications as well as the active part of the world we live in, so their impact on humans and their perception of the environment could never be regretted

(Figure 1).

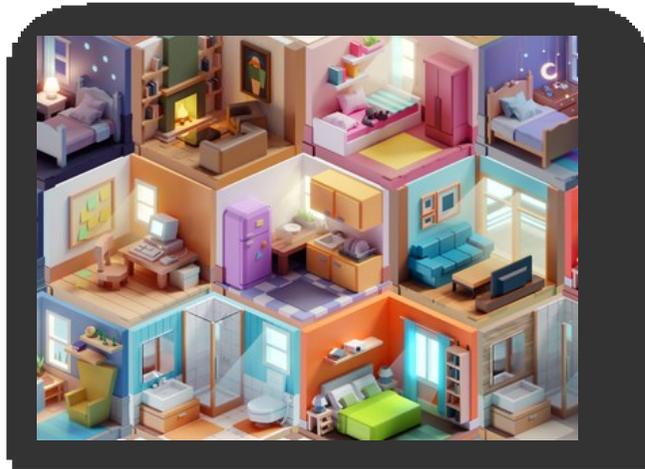


Figure 1. Colors affect the soul with different feelings, some directly and others indirectly

Colors are one of the most important aspects of interior design, so they must present a key role within the formation of a suitable space corresponding to the living and working space of human beings. Various researches have proved the fact that colors have some of the most impressive and intensive psychological and physiological effects on humans, for it to be the most important and significant in knowing how different colors affect the space users. It is similar to concluding that how cheerful a person feels when there is a sunny day if he/she lives in a snowy and cloudy area; and also how unhappy a person feels on a rainy day if he/she has to postpone his schedule of work and travel. Colors have the energy and potential to influence both emotions and cognitive processes (Gökçakan, 2016).

Different experiences, realistic and thoughtful memories, cultural differences, and human motives on different thoughts have the power to influence color perception, likewise, the same color has different effects on different people. When designing an interior space, it is mandatory to have experience in working with colors. An interior designer should have the repository knowledge and understanding of the impact of colors, psychological effects caused by those colors on humans, and so must have the courage to know where it can be employed and addressed to obtain a combination appropriate for each situation. Combining colors with other highlighted and rigorous colors and using them in the interior designing of personal or working

environments can result in a positive or negative impact on human beings. So, there is a need to thoughtfully employ them and stand by your choices (Figure 2).



Figure 2. colors can change the whole environment into pleasant or dull

Space will have the power to address and advocate comfort and serenity, while on the other hand, colors can also cause a feeling of discomfort, if not properly analyzed and studied with the nature and psychology of viewers. They are a very powerful tool in interior design, so they can also create various illusions in space. As with this power and potential, a small room may appear larger or smaller (Figure 3), with the effects of colors and inappropriate choices of colors that could thoroughly impact its orientation.

When architecture or designers does not permit flexibility, one of the most important solutions ad ready wear solution is choosing the right and obvious

colors. Due to some blackened assertions and negative impacts, the research study has a special focus on the impacts of colors on the users of specific spaces. The effects of color choices are discussed, both regarding the housing and public spaces like amusement parks, working



Figure 3. colors can make the place feels cold or warm, wide or small

environments, etc. The psychological effects of various designs of working environments and house interiors are discussed in further sections of this research study.

2. Previous Studies

Interior designing couldn't be completed or accomplished without the amalgamation of suitable colors. These are explained and elaborated well in previous studies, research, and books on interior designing.

A research study discussing the characteristics of colors, interior design, and their psychological effects conducted by Nurcan (Nurcan GÖKÇAKAN ÇİÇEK, 2018) and her fellows discussed the views of psychologists, interior architects, designers, doctors, and fanatic writers about how they think about and perceive the impact of interior design and colors. They examined various national and international interests and researches related to colors and their psychological impacts and physiological impacts with an investigative purpose. Their basic aim is to fulfill the goal of interior design in the creation of physical environments that address different types of physical, mental, emotional, and social requirements. They emphasized the motive that these physical or psychosocial environments are created to make people feel happy, peaceful, comfortable, and healthy while undergoing these physical environments.

They considered interior designing as art to achieve helpful and peaceful visual effects and prospect better functionality. They highlighted the need that people have the expectations that different types of places are so designed that help in understanding the structure and make them feel psychologically well. Setting aside these interiors designing art principles, impacting human psychology at a broader pace, they discussed the impact of colors on (Figure 4).

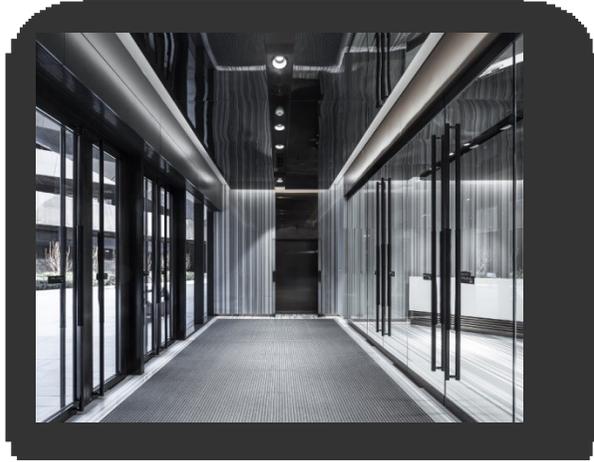


Figure 4. A place without colors makes it dull cold area.

Human emotions as well which has the potential to attract scientists' attention in past and present as well. But for such a purpose there is a limited number of studies that have been conducted with such a motive. Their study was oriented to generate the motive and result of those previously conducted studies to help understand these various designing fields with an alternative psychological impact. So, the plan was to create a human-friendly environment and present a place where people can live happily, peacefully, and healthy. The second purpose was to understand the mythology of certain colors used at home and in the working environment to understand how it helps in working better, with positive gestures, and with a sound mind.

Another past study was conducted by Y.Tsunetsugu (Y.Tsunetsugu, 2005) and his research fellows with the subject of Visual effects of interior design in actual-size living rooms on physiological responses; this was aimed at

studying the effect of visual environments and how it affects the daily living scenarios by analyzing how humans respond to it. For such a study, they go on to plan two actual-size living rooms with different postures, different interior designs, and different aesthetics. They further analyzed the cerebral blood flow, pulse rate, and blood pressure of observatory subjects who spent their 90's in these rooms.

They studied the impacts of these two different interior aesthetics and found no significant differences between the impacts given by these two rooms in the overall evaluation. Yet some differences couldn't be forgotten. These two rooms presented different physiological responses to different humans. The first room which is highlighted with its ordinary interior designing structure caused a relaxing state to human's blood pressure and mental health, while the second room that was designed with visible wooden posts and beams possessed an ability to cause an active and aroused state in mindful thoughts and showed hikes in blood pressures.

A book was written by K. Haller (Haller, 2017) with the impact of studying Color Design has analyzed different human reactions to different colors and associated it with the unconscious mind. But the writer is oriented to argue that colors have the power to affect the quality of life and the wellbeing of humans. A chapter that is under discussion entails that a combination of

important color considerations adopted by an interior designer while undergoing the creation of valuable and different color schemes for residential and commercial spaces. The writer highlighted the inclusion of personal color preferences, cultural preferences, geographic preferences, and economic motives as well as, trendy outlooks, psychology of colors, and human choices overall. The writer has also entailed the skills of interior designers, tools used in interior designing purposes, processes, and personal choices that designers could imply in adapting the environment overall.

Another research study conducted by Heba-Talla Hamdy Mahmoud (Mahmoud, 2017) with a motive to investigate the factors that have a higher impact on psychological aspects of residents and are assumed to be more influential in discussing the relationship between architecture and interior designing. They emphasized raising awareness about these aspects and giving knowledge to people about the fundamental factors, discussing the identical trends, giving identity, appropriate privacy measures, and safety concerns, health issues, how many open spaces the design features, and the overall aesthetic looks.

There are two different aspects of this research study; the first one is oriented to identifying what could be the fundamentals of each factor, and the second one is about recognizing the important architectural consideration needed to

realize the psychological impacts on residents. This study is aimed at increasing and highlighting the importance of the interaction of interior designing and its psychological impact on humans and human behavior. The writer suggested understanding the approach, human interests, and motives of the place to be used for. This way, the designers feel comfortable in choosing and applying a suitable interior architectural design that will eventually be the meeting the standards of psychological needs and will eventually be the bridge between architecture, interior design, and the psychological state of residents.

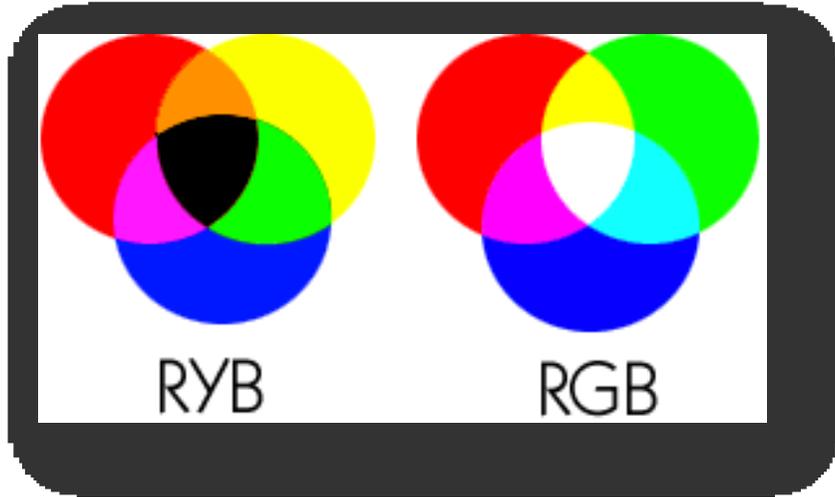
Another research study conducted by Amany Mashour Hendy (Hendy, 2021) with the subject of beauty in interior design and the human health has discussed the ongoing development of scientific disciplines, associated researches, and their impacts on a person's psychological health. He called the design elements and aesthetic features a way to enhance human health and relieve him of tensions, pressures and overcome difficulties in life. Therefore, his research study is all about determining and highlighting the beauties of interior design by asking participants different questions and analyzing the literature on this topic that could be the possible way to determine the beauty or the ugliness of the interior design. This way, he justified a relationship between interior design's aesthetic features and its contribution to human psychological health. He defined criteria that are

useful in achieving the beauty of interior designing and defined the pure impacts it has on human psychology.

3. Research methodology

The purpose of this research is to highlight the psychological effects of colors on human beings and their formation, as well as, the overall impact on human health regarding choosing the right colors in interior designs. The designs will have serious impacts on your health if you choose cool colors as these are proven to provide results. People are more often less realistic on choosing colors and don't have enough knowledge on choosing colors, yet they are choosing colors not matching their psyche and results in aggression and less suitability of their mental health. Let's understand the psyche of colors and the psychology of the human being associated with these colors.

4. Types and pre-requisites of colors



Colors are defined to have different sensations on the human eye as a result of the way objects reflect or emit lights (Behbahani, 2011). Though this is a scientific phenomenon but used in different areas of our lives (Figure 5) . The colors have got more fame and sensation after the experiments of the famous mathematician and physicist Sir Isaac Newton who conducted some experiments in the 17th century and deduced the conclusions that rainbow consists of all the existing colors. He used a prism to reflect all seven colors on a white background and he called them the Visible Spectrum. This color spectrum involved red, orange, yellow, green, blue, indigo, and violet. That was the first-ever circular color diagram and was designed by Sir Isaac

Newton in 1666. The most common version as of today is the wheel of 12 colors based on the RYB color model (Figure 6).



Figure 6. RYB color model

To understand the scheme of colors, you need to understand the categorization of primary and secondary colors. Three primary colors are red, yellow, and blue. The secondary colors are formed by mixing these three colors. For example, if you combine blue and yellow colors, the results will be green color, if you combine red and yellow color, the result will be orange and if you combine blue and red colors, the result will be the purple color. By moving through the RYB color wheel, harmony between neighboring colors could also be seen. The colors that lie side by side are called harmonious colors. Colors in a circle facing each other are called complementary or

opposite colors. Moreover, the color wheel has also another division that is warm and cool colors.

Out of these seven colors that make up the visible spectrum of colors; red, orange, yellow, and some shades of green are categorized as warm colors. Warm colors are considered to be more energetic and bolder, so they will leave both positive and negative effects on your mind and psychology. By using these warm colors, something can be highlighted, distinguished, and significant, but using too much of them in a relatively smaller space will result in more congested perceptions. Warm colors can stimulate your nervous system, so with these influences, the heart rhythm and blood pressure could also increase, as well as will perish the layers of breathing (Noor A. Ibraheem, 2012).

The green, blue, indigo and violet colors from the visible range of colors are categorized as cool colors. They possess the opposite effect from that of the warm colors. They have also an influence on the nervous system. They can reduce your pulse, blood pressure, and breathing speed, to feel more relaxed. In certain areas and spaces like hospitals, there have been experiments in the recent past with the blue rooms possessing a calming effect on patients' health. The remaining three colors including white, black, and grey are considered to be neutral colors.

4.1 color and religion

Many religions gave the effect of colors a special value and took on symbolic connotations.

Yellow: A sacred color in China and India as well as European Christians and used by the ancient Egyptians to symbolize the god Ra, the sun god.

White: a sacred color in ancient times for the Roman god, and he used to sacrifice white animals for him, as well as Christ symbolizing the white dress for his purity and optimism, as well as for Muslims, who wear the white color during Hajj and Umrah.

Green: In the faith, it represents devotion, immortality, and spiritual contemplation. It is the favorite color of Catholics. It is the color of Easter and symbolizes resurrection, as well as the color of Baptism. It is associated with Muslims with the color of heaven and bliss.

Red: In Western religions, it symbolizes martyrdom for the sake of a principle or religion, and it is a symbol of Hell in many religions.

Blue: It represents a special place in Hebrew, as it is the color of Jehovah Lord, and it is one of their sacred colors.

4.2 Psychological effects of colors

Colors have a direct effect to influence the mood of the human being and therefore play an important part in the life of those humans. Man is bound to be a visual creature; has more attractiveness to colors, and will have positive as well as negative impacts on the psychology of the human being. He gets around 87% of his/her sensory information through the world of colors. It has been proven that a person reacts differently to different colors as this might vary with warm and cool colors and that colors can stimulate different emotional states in humans. Colors have a powerful impact on the psychology of humans and to a great extent colors directly affect the habits, norms, and restraining effects, as well as, life in general. Everyone has a range of favorite colors that reflect their personality (Aleksandra A. Ćurčić, 2019).

Psychologists have concluded that colors have serious impacts on certain emotions within humans. Feelings are an important part of humans as they have serious implications with real life and when it comes to the design of living and working spaces, there are serious implications with emotions of the

humans (Figure 7). When designing interiors of public spaces, it is significant to know what

effects and emotions are caused by different colors. This way, you can have an idea of what are the emotions and how these are aligned with certain colors. Whenever you analyze the primary colors used in designing the interiors, and their relation to feelings and symbolism is explained in this research study (Sandeve, 2017).

Red Excitement Strength Love Energy	Orange Confidence Success Bravery Sociability	Yellow Creativity Happiness Warmth Cheer	Green Nature Healing Freshness Quality	Blue Trust Peace Loyalty Competence
Pink Compassion Sincerity Sophistication Sweet	Purple Royalty Luxury Spirituality Ambition	Brown Dependable Rugged Trustworthy Simple	Black Formality Dramatic Sophistication Security	White Clean Simplicity Innocence Honest

Figure 7. the different effects of colors

Talking about the effects of the colors, the first one here analyzed is Red color, which is the most vibrant and compelling color in the visible spectrum. Red color can express passion, love, warmth, excitement, power, and energy, etc. Red color can grab immediate attention and brings objects or images to the foreground, because of its powerful and significant effects on the human nervous system. It is the strongest among the warm colors, therefore, possesses the ability to change a space into looking compact and attractive.

The next color in this phase is Blue (Figure 8), which is



Figure 8. Blue color give coolness to the

categorized as the color of harmony and peace, but it is also recognized as a cold, unemotional, and unfriendly color. Blue has always been the symbol of faith, hope, and loyalty. In physiological aspects, it has a direct impact on calming the central nervous system. Therefore, it reduces the pulse and blood pressure but increases concentration that is simply marvelous with its orientation.

The next color in this phase is Yellow which is associated with joy, optimism, and warmth. Yellow is categorized as the most joyful color

throughout the visible spectrum. Yellow encourages concentration and alertness. Moreover, it has a beneficial impact directly on your nervous system, can stimulate blood pressure, heart rate, and breathing, as well as it can trigger your fears (Osborne, 2015).

The next color in this phase is Orange, which is a thoughtfully stimulating color and possesses the ability and energy of red and the cheerful qualities of yellow. Represented by the sun. Orange color can improve appetite, stimulate the heartbeat, and is considered to be good for the treatment of depression.

The next color discussed here is Green, which is the color of nature, has restful powers and refreshing abilities. It possesses great healing powers which is one of the reasons that why it is a dominant color in hospital interiors. Greenlight reduces blood pressure, reduces stress, expands capillaries, stimulates the endocrine glands, as well as relieves insomnia. Pale green is considered to be the most relaxing and calming color in the visible spectrum (Andrew J. Elliot, 2014).

The last color discussed here is Purple, which is often characterized as a mysterious color. This is a mixture of blue and red colors and is believed to be the color of sensitivity and artistic nature. Violet light waves have an impact on the human brain, purify thoughts, and have a refreshing and disinfectant effect on the body of the human being. It can regulate

metabolism and suppresses hunger. Indigo light waves possess the ability to fight against high fever and skin diseases.

4.3 Use of colors in residential spaces and their psychological effects

Housing spaces have a significant role in the everyday life of a person. The way that space is designed will have a direct and definite impact on the individual's mind. In addition to these appropriate solutions and choices of furniture, the colors implemented in the



Figure 9. Colors have a psychological effect that causes optical illusions regarding surfaces and volumes

interior design might change the overall impression (Figure 9). Also, the purpose behind the outlays of the space may define the choice of suitable colors. Thus, the usage of certain colors should be adapted to the day and night zones of the residential areas.

Various factors affect the choice of colors in the housing space interior. The used color patterns might also have something to deal with the climate. For

example, the usage of patterns dominated by warm, cool, or neutral colors can have an impact on the climate and orientation. So, warm colors are more acceptable in cooler climates, while cool colors are more used in hot climate areas.

4.4 Use of colors in non-residential areas and their impacts

Though the focus of interior designing is often towards residential areas, yet it is not certainly limited to the home environments. Today's Lifestyle dictates that people spend more time in working environments and spend time out. The non-residential environment should also be well planned. The impact of colors in the interior of public spaces; mainly the offices, hospitals, and schools are discussed. An office interior design depends upon the nature of the job. So, a lawyer's office interior design should be different than an IT company office (Aleksandra Ćurčić, 2019). The basic objective behind every interior design is to achieve a creative and effective working environment that stimulates the working productivity of the employees and looks comfortable. It is very important to know how colors impact the health and productivity of the employees. It has been proven that the working space design will have direct impacts on job performance and communications among boundaries of the business or its working environment.

Survey results

A questionnaire was distributed and sent by e-mail to 2000 Kuwaiti citizens, only 957 persons had replied with 547 female, and 410 male randomly selected from different governorates of Kuwait (Figure 10 A, B, &C).

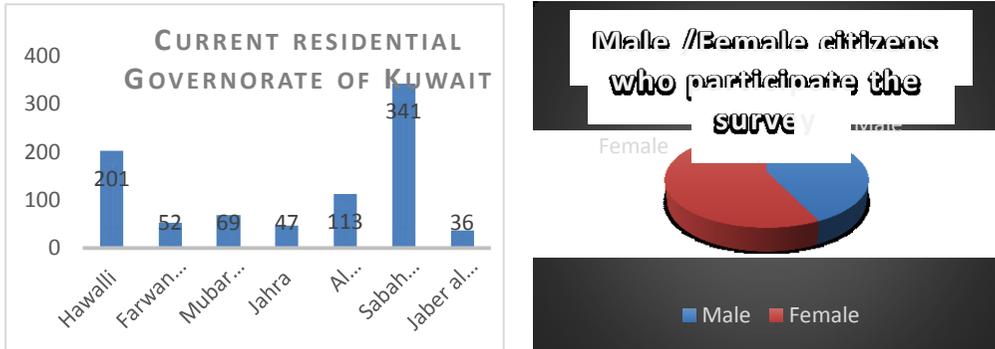


Figure 10 A, B. Survey participants

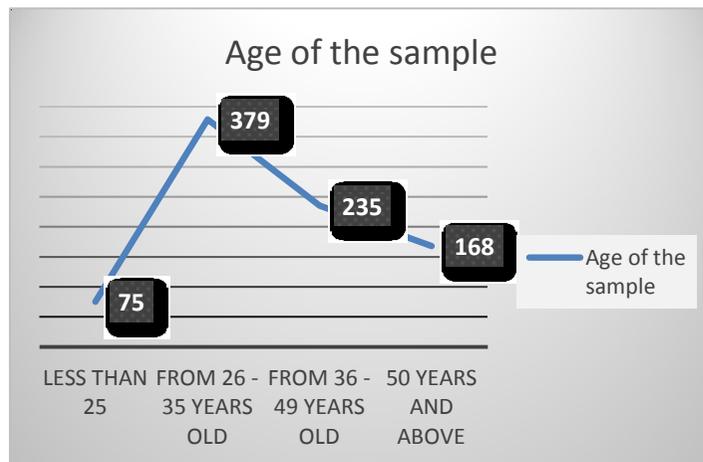


Figure 10 C. Chart shows the age of the chosen sample

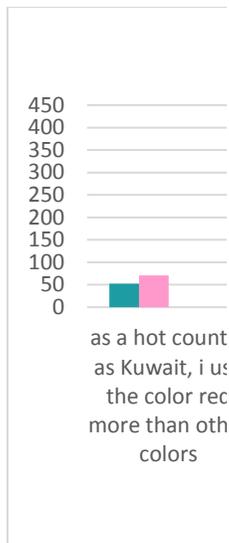


Figure 11. Chart of the Citizens response

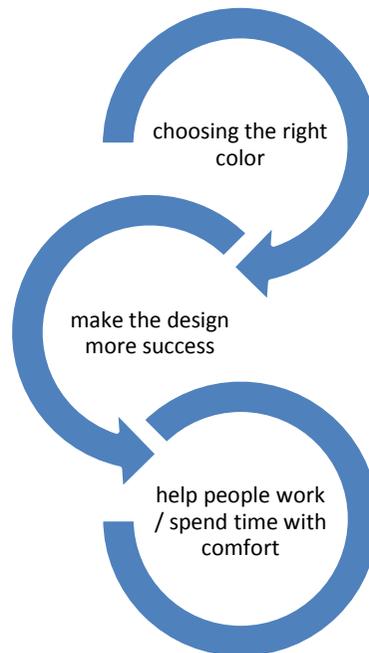
There were five main questions that were asked, in order to understand their point of view about colors. The first question was in regards to a hot country as Kuwait, by using the color red more than other colors in interiors such as wall colors, furniture or carpets, as it shown above in the chart (Figure 11), The Females had a slightly higher response than males, but still both response were low regarding using the color red. The purpose of asking this question was to see whether participants have any color influence knowledge, being red as one of hot colors is not suitable for hot areas as Kuwait. The second question, the male response higher than female when asked if they prefer using white color in a kitchen & bathroom. Males generally don't like taking risks in using new or colors. During an interview with some of the male participants it was clear that most of the male participants prefer white especially in small areas such as toilets, the females however, prefer white colors

being it's easier to clean as you can spot the dirt much easier. For the third question, it asks houseowners if they choose room colors according to the type of activity that they practice in for instance having calmer colors displayed in the bedrooms, or more bolder colors in a living room, male response was less than female, Females prefer choosing specific colors in some areas of the house according to the intended use of the space. In the fourth question, the question asks houseowners if they choose colors of specific area according of its space, smaller areas and bigger areas may be styled differently as a result, again, male response was less than female, and both responses were low. The chosen colors have been chosen according to their own taste regardless of the size of the rooms. The fifth question asked the participants if they choose one color for the whole house interiors. According to the chart, male response were higher than female in this question. Male don't want to have the hassle of choosing a color for each space, they did not mind having one color throughout the house as long as it had a nice flow. Female preferred having different shades of colors in each area of the house and not stick to one color.

5. Conclusion

The color phenomenon and its proper directives are studied for centuries throughout human evolution. Even though there are some myths associated with the colors, about the perception of colors, and visual comfort they provide, their impact on our mood and productivity could never be ignored. Colors play an important role in the world of design, interior designing, and architecture. They are related to various uses of space and possess a great

Figure 12. chart of the influence of color



impact on human life (Figure 12). Persons dealing with interior designing must possess knowledge about various effects of colors.

In this research study, there are various facts presented and analyzed together with some basic characteristics of colors and their implications in various cases and different scenarios. Symbolical, as well as, psychological perceptions of colors and their implementations in interior designing are discussed in this research study. In addition to the housing space, and implementation of adequate color combinations, public spaces, and residential spaces are analyzed and discussed with their motive of psychological effects on human beings. By analyzing the real-life examples and examining the experiments, concluding the positive and negative impacts of colors on human psychology are studied. In addition to all those psychological effects they cause, physiological changes in masses together with the changes in productivity are explained.

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