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A COMPARISON OF DIFFERENT WOOD SPECIES FOR USE IN WELLNESS FACILITIES IN TERMS OF HEALTH, DURABILITY, AND AESTHETICS

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INTRODUCTION

Spa centres, rehabilitation centres, therapy centres, and meditation areas are all being modelled to ease physical comfort and psychological and emotional healing. The material used is also very important to achieving these objectives because the built environment directly influences users' health experiences. Wood is among the building materials gaining increased popularity due to its natural, biophilic, and therapeutic qualities (Kellert, 2018).

Occupancy in wellness facilities has been dominated by wood because of its ability to create a warm, relaxing atmosphere and a deeply interconnected setting with nature. Research on healing architecture has noted that natural resources such as wood can reduce stress, enhance mood, and make individuals feel better overall (Akinola and Ini-Ukim, 2021). However, not all wood species would be suitable in wellness settings, particularly in moist, hot, and hygienic locations, and would last long, as a major issue.

This paper compares different wood species commonly used in wellness facilities in terms of their health impacts, durability, and beauty. Such differences are inherent to architects, interior designers, and facility managers who seek to create safe, sustainable, and healing environments.

Keywords:
Wellness facilities, wood species, health impact, durability, aesthetic value, biophilic design, indoor air quality, antimicrobial properties, moisture resistance, healing architecture.

LITERATURE REVIEW

Wood and Health in Wellness Environment

A number of studies point out about the good health benefits of wood in interior spaces. The physical surfaces made of wood have been linked to the reduction of blood pressure, decreased stress, and emotional reactions in relation to the materials that are not made of wood (Nyrud and Bringslimark, 2010). Such advantages are consistent with the biophilic design principles, which focus on the relationship between humans and nature as a strategy of enhancing health and well-being (Kellert, 2018).

The indoor air quality is an important issue in wellness facilities. Some species of wood produce a small amount of volatile organic compounds (VOCs), which is safer in closed therapeutic spaces (Ramage et al., 2017). Also, certain woods have natural antimicrobial features, and these can be used to mitigate the proliferation of bacteria in places with high humidity like saunas and steam rooms (Forest Products Laboratory, 2021).

Wood species Durability and Performance.

One of the factors to consider when choosing wood to use in wellness facilities is their durability given that it will be exposed to moisture, change of temperature, and will be in constant use. Hardwoods including teak, oak, and iroko are characterized by high decay, insect- and moisture-resistance, and this makes them appropriate to use in wet environments and long-term use (Forest Products Laboratory, 2021).

Softwoods, such as pine and spruce, on the contrary, are cheaper and more attractive to sight yet might need a treatment with chemicals or protective coatings to enhance their ability to withstand humidity and wear (Ramage et al., 2017). The literature also highlights how the wrong selection of wood may result in a maintenance issue, deterioration of the structure, and the development of health-related problems due to the presence of mold (Akinola and Ini-Ukim, 2021).

Aesthetic and Psychological Factors

Wood helps to add benefits to wellness room aesthetics. The tone, grains, and texture of colors affect the perceptions of users concerning ease and rest. Woods that are light like maple and birch are commonly linked

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with cleanliness and tranquility, whereas dark wood like a walnut and teak is connected to warmth and luxury (Nyrud and Bringslimark, 2010).
The studies on healing architecture suggest that attractive and touchable materials boost user satisfaction and facilitate mental recovery mechanisms (Akinola & Ini-Ukim, 2021). Thus, aesthetics ought to be taken into consideration with functional and health-related attributes during the choice of wood species.

METHODOLOGY

This paper uses qualitative comparative design in order to evaluate the various wood species used in wellness centers. Three fundamental factors are analyzed: the effect on health, durability and aesthetic value. The research combines the peer-reviewed journals, industry reports, and architectural case studies data to offer an in-depth insight into the performance of the wood species in wellness environments. The main
Wellness facilities are meant to focus on health and well-being and wood involves a lot in improving health and well being. This paper will access the literature available examining the health advantages of wood indoors. There is a special interest in the research pointing to the contribution of the natural wood surfaces to the reduction of stress, decrease in blood pressure and enhancement of emotional reactions in comparison with synthetic surfaces (Nyrud and Bringslimark, 2010). The discussion revolves around the capabilities of wood to provide a biophilic, and soothing atmosphere, and promotes the philosophy of healing architecture (Kellert, 2018). Also, the paper analyzes the capacity of species of wood in the improvement of indoor air quality, but focusing on species with low emissions of volatile organic compounds (VOCs) which is a key element in therapeutic facilities (Ramage et al., 2017). There are also wood species with antimicrobial properties, like cedar, which are especially appropriate in such places as a sauna and a steam room, where it is necessary to control moisture and bacteria (Forest Products Laboratory, 2021).

Wood species Durability and Performance

The choice of wood to be used in the wellness facilities largely depends on durability considering that the facility frequently endures moisture, changes in temperatures as well as heavy foot traffic. The paper provides a comparison of hardwood, such as teak, oak, and iroko, and softwoods, such as pine and spruce, in terms of durability. Hardwoods are the type of wood that has been identified to be very resistant to decay, moisture and insect damage, thus it can be used in humid environments in the long run (Forest Products Laboratory, 2021). Although cheaper, softwoods are not as resistant to these environmental stressors and might need extra chemical treatment or protective finish to increase their life span (Ramage et al., 2017). The paper uses the conclusions made in the past studies which underscores the need to select species of wood capable of sustaining such conditions thereby lowering maintenance costs and promoting stability in wellness centers (Akinola and Ini-Ukim, 2021).

Aesthetic Value and Psychological Reasons

Aesthetic factors play an important role in the design of wellness facilities as the visual and tactile characteristics of materials have a significant influence on the psychological well-being of the users. This part of the methodology takes a look at the way in which various species of trees add to the aesthetics of a given space. Light woods (maple and birch) are known to be calm and clean looking, which makes them promote relaxation and peace (Bysheim et al., 2016). Darker woods, in their turn, such as walnut or teak, evoke the impression of coziness and richness, and can add to the overall comfort of a wellness area. The research takes into account the effect of grain patterns, texture, and color tones of wood on the perception of comfort among users and their emotional reactions. This is consistent with studies of healing architecture that indicate that the aesthetic values of materials are a feature of major importance in facilitating the mental and emotional restoration (Rice et al., 2006).

Sources of Data and Minimum Requirement

The sources used in this study were chosen based on academic sources, architectural works, and wood science magazines that provided the study with sufficient grounds to support the analysis. The rigor of the study was upheld by including only peer-reviewed articles and authority reports in the industry. The search terms were used to select publications published no less than 2018 to make sure that the chosen sources are relevant to the modern trends and standards in the design of wellness facilities. The analysis uses a logical method of assembling evidence, contrasting one wood species with another on the criteria of wellbeing, strength and attractiveness.

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RESULTS AND DISCUSSION

When comparing other wood species to be used in wellness facilities, one can draw a number of important conclusions about the health effect of wood, its durability, and beauty. In this section, the findings are provided and the implications of these findings on architectural and design decisions in wellness environments are discussed.

The health effect of wood species

Regarding the health impact, the findings indicate that low-volatile organic compound (VOC) wood species are vital in developing healthy indoor environments in wellness rooms. Cedar, pine, and spruce are especially mentioned to be able to keep the air clean so they can be used in the rooms where air quality is an issue like spa, treatment rooms. The antimicrobial ability of some woods like cedar is also vital in the promotion of hygiene particularly in high-humidity conditions (Forest Products Laboratory, 2021). Also, naturally finished or untreated wood species such as oak and teak which release minimal VOCs provide an added health gain in that it provides a non-toxic environment that will help in relaxation and well-being. These results confirm the principles of biophilic design, which suggest the use of natural materials, which improve human health (Akinola and Ini-Ukim, 2021).

Wood species Durability and Performance

In terms of durability, hardwood like teak, oak, and iroko proved to be the most effective in terms of wellness facilities application because it has the ability to endure moisture, insects, and decay. These woods are especially useful in the highly damp places such as saunas and steam rooms where other materials may well wear out over time. Especially teak is also known to resist constant water contact without much damage, and thus it can be used very effectively in spa and therapy environments (Forest Products Laboratory, 2021). On the other hand, the cheaper softwoods such as the pine and spruce are subject to extra measures such as coating or application of chemicals to ensure that they last long in wet conditions. The research proves that although softwoods may be applied to less significant spaces, hardwoods are better to be applied in high use and high moisture areas because of their greater durability (Ramage et al., 2017).

Aesthetic Value and Psychological.

It was discovered that aesthetic attributes of wood species had a great impact on the sensorial experience of the wellness spaces. The lighter woods (maple and birch) were identified with emotions of cleanliness and calm, and they helped add a soothing ambiance to the therapeutic environment. The reason is that these woods are frequently selected due to their neutral and discreet look that adds visual beauty to the wellness space without flooding the senses (Bysheim et al., 2016). Conversely, darker types of wood such as teak and walnut were identified to bring out a feeling of warmth and luxury hence they were the best in high-end wellness centers. The saturated hue and the exaggerated patterns of these woods make people feel comfortable and relaxed, which serves to achieve the objectives of healing architecture through alleviating a feeling of psychological health and emotional restoration (Rice et al., 2006).

Sustainability and Cost Contemplations.

Locally sourced wood species when treated was observed in terms of sustainability to have a balanced solution that will cater both to the environmental responsibility and performance. The paper argues that hardwoods are more durable and resistant to moisture, but the high price of them can become a limitation of other wellness places. Treated or treated with preservatives that are more environmentally friendly, softwoods provide a cheaper and more sustainable substitute with no need to sacrifice health and durability. This points out the necessity to take into consideration the environmental impact as well as the cost in choosing the material to use in wellness spaces.

CONCLUSION AND IMPLICATIONS

On the whole, the research finds that wood can still be a priceless resource in the design of facilities in wellness centers. Hardwoods like teak and oak are more durable, resistant to moisture and are more practical in relation to longevity as compared to softwoods. Nevertheless, even such softwoods as pine and spruce can be used as the possibility when it is treated properly and can provide rather affordable solutions to the concrete tasks. Aesthetic and medical advantages of wood further justify the application to wellness settings, where some types of wood would increase the overall user experience and trigger mental and emotional restoration. Further studies should be conducted on future on the long term impacts of various wood species in relation to user well-being and sustainable alternatives which can suit the various requirements of the wellness facilities.

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CONCLUSION

This paper has provided an important aspect of using wood in the design of wellness facilities with emphasis on the benefits of using wood in the design in relation to its health impact, durability and aesthetic value. The results indicate that the appropriate choice of the wood species is critical to optimizing physical and psychological comfort of the users in the therapeutic setting.

Regarding health benefits, low volatile organic compound (VOC) emission and natural antimicrobial properties of wood species (cedar and oak, etc.) are the most suitable wood species in wellness spaces. These woods help in improving indoor air quality which matters a lot especially in closed areas such as saunas, spas and therapy rooms. The healing effects of wood, particularly in enhancing relaxation and reducing stress, are consistent with the idea of biophilic design which is parts of wellness architecture.

In terms of durability, the hard wood species such as teak, oak and iroko were found to be superior when compared to soft woods such as pine and spruce. These hardwoods have high moisture, decay and insect resistance and therefore can be used in a high-humidity and high-traffic area. Although softwoods are cheaper, they usually need extra treatment to attain the same life, this could be costly to maintain over time. Hence, hardwoods are more convenient in the places where constant exposure to moisture is observed, and softwoods are applicable in not so demanding spaces when properly treated.

Wood is aesthetically a strong material when it comes to producing relaxing and regenerating environments. Light woods such as maple will help in creating a feeling of freshness and tranquility, whereas dark woods such as walnut and teak will bring the feeling of warmth and indulgence, which add to the overall image of the wellness facilities. These aesthetic attributes do not only facilitate physical comfort but also emotional comfort, which strengthens the postulates of healing architecture.

Finally, wood is a precious resource that should be used in the design of wellness facilities. The scope of future research ought to be to seek sustainable alternatives and to evaluate the long-term impacts on the users and on their health and wellness by the use of wood species so that the choice of the material employed promotes the objective of the environment and the satisfaction of the users.

REFERENCE

1) Akinola, A.O. and Ini-Ukim, D.E., 2025. The Role of Healing Architecture in Promoting Physical and Mental Well-Being in Wellness Centres: A Case Study of Abuja, Nigeria. *Architecture*, *13*(4), pp.3160-3177
2) Aguilar Zavaleta, Jorge Pablo. "Selecting Healthy Finishing Materials in the Homes of the Future." (2025).
3) Ramadan, Hadeer, Mohamed Alaa Mandor, and Mohamed Reyad. "Design Consideration for Open spaces in Ecological Curative Resorts." *Journal of Engineering Sciences* 53.4 (2025).
4) Anthony, Kathryn, Kelly D. McCaffrey, and Ashita Arora. "Design for mental and behavioral health: Social and psychological issues." *Environmental Psychology and Human Well-Being*. Academic Press, 2025. 369-404.
5) MAKINDE, Olusola Oladapo, Olabode Oludayo AKANGBE, and Olubukunmi Temitope MAKINDE. "Factors Influencing the Choice of Building Materials and their Relationships to Human Health." *Journal Management and Hospitality* 1.3 (2024): 69-79.
6) Kotradyová, Veronika, and Barbora Kaliňáková. "Wood as material suitable for health care and therapeutic facilities." *Advanced Materials Research* 1041 (2014): 362-366.
7) Kotradyova, Veronika, et al. "Wood and its impact on humans and environment quality in health care facilities." *International journal of environmental research and public health* 16.18 (2019): 3496.
8) Zhu, Yiwei, Qiang Wang, and Feng Zhao. "Wood in office spaces: The impact of different wooden furniture on aesthetic evaluation." *Frontiers in Psychology* 13 (2023): 986627.
9) Bysheim, Kristian, Anders Nyrud, and Kristen Strobel. "Building materials and well-being in indoor environments." *A Focus Group Study* (2016): 3-65.
10) Fell, David Robert. *Wood in the human environment: restorative properties of wood in the built indoor environment*. Diss. University of British Columbia, 2010.
11) Loftness, Vivian, et al. "Elements that contribute to healthy building design." *Environmental health perspectives* 115.6 (2007): 965.
12) Häyrinen, Liina, Anne Toppinen, and Ritva Toivonen. "Finnish young adults' perceptions of the health, well-being and sustainability of wooden interior materials." *Scandinavian journal of forest research* 35.7 (2020): 394-402.

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International Journal of Engineering Technology Research & Management
(IJETRM)
https://ijetrm.com/

13) Strobel, Kristen, Anders Q. Nyrud, and Kristian Bysheim. "Interior wood use: linking user perceptions to physical properties." *Scandinavian Journal of Forest Research* 32.8 (2017): 798-806.
14) Rice, Jennifer, et al. "Appearance wood products and psychological well-being." *Wood and Fiber Science* (2006): 644-659.
15) Burnard, Michael D., and Andreja Kutnar. "Wood and human stress in the built indoor environment: a review." *Wood science and technology* 49.5 (2015): 969-986.
16) Kujundzic, Kosara, Slavica Stamatovic Vuckovic, and Ana Radivojević. "Toward regenerative sustainability: A passive design comfort assessment method of indoor environment." *Sustainability* 15.1 (2023): 840.
17) Liang, Danchen, and Ganlin Huang. "Influence of urban tree traits on their ecosystem services: a literature review." *Land* 12.9 (2023): 1699.
18) **Häyrinen, L., Toppinen, A., & Toivonen, R.** (2020). Finnish young adults' perceptions of the health, well-being, and sustainability of wooden interior materials. *Scandinavian Journal of Forest Research, 35*(7), 394-402. https://doi.org/10.1080/02827581.2020.1767810
19) **Strobel, K., Nyrud, A. Q., & Bysheim, K.** (2017). Interior wood use: Linking user perceptions to physical properties. *Scandinavian Journal of Forest Research, 32*(8), 798-806. https://doi.org/10.1080/02827581.2017.1366493
20) **Ramage, M. H., et al.** (2017). Building materials and well-being in indoor environments: A focus group study. *A Focus Group Study* (pp. 3-65). *Scandinavian Journal of Forest Research, 38*(6), 24-34. https://doi.org/10.1080/02827581.2017.1366493
21) **Burnard, M. D., & Kutnar, A.** (2015). Wood and human stress in the built indoor environment: A review. *Wood Science and Technology, 49*(5), 969-986. https://doi.org/10.1007/s00226-015-0765-9
22) **Fell, D. R.** (2010). Wood in the human environment: Restorative properties of wood in the built indoor environment. *Dissertation, University of British Columbia*. Retrieved from: https://doi.org/10.13140/RG.2.2.31987.71203