

# The Brief study on the Human Nail

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**ABSTRACT-** A nail is a structure which is not a bone made up of different composition than skin tissue like keratin which is also found in hair and this is also shown as an outer layer of skin for protection. Nail used to protect finger tips and surrounding tissues from injury. The epithelial matrix cells adhering to the nail bed give rise to the development of nails. There is a difference between healthy and unhealthy nails which is recognizable by their difference in color, healthy nails are pink in color and have a flexible smooth and glossy surface of nail. When it comes to growth the development of nails is an indication of eliminating dead cells from the human body. The growth rate of nails are higher in children than young and elderly adults. Human nails and issues connected with it such as size, color and form of the nail will also reveal the kind of illness and problems associated with the body. Human nails consist of numerous components which have been described in this article and also nails utilized to accomplish different jobs are also detailed in this paper. Human nails may act as an indication and it is a very useful method for the treatment of various illnesses. In this paper also discussed the purpose of the study which is to measure the ph level of the nail and maintain healthy nail, to maintain the healthy nail we have to measure the ph level of nail paint and other nail related chemicals so that it can give a healthy and shiny nail plates, in this paper on the basis of healthy ph value of nail plate people can control the flow of nail paint and nail paint remover on it. Also, the scope of the invention and why taking care of nail and nail related treatments and issues has been addressed in this paper, how we can maintain or raise or reduce the PH level of nail has also been mentioned in this paper.

**KEYWORDS-** Acetone, Chemicals, Eponychium, Hyponychium, Lunula.

## I. INTRODUCTION

A fingernail is a construct that is not a bone made up of many different composition than skin tissue like keratin which is also found in hair and this is also shown as an outer layer of skin for protection[1]. Nail used to protect finger tips and surrounding tissues from injury[2][3]. The epithelial matrix cells adhering to the nail bed give rise to the development of nails[4][5]. There is a difference between healthy and unhealthy nails which is recognizable by the variation in color, good nails are pink in color and have a flexible smooth and glossy surface of nail[6].

The visible portion of the matrix, the white crescent-shaped base of the visible nail, is known as the lunula ("little moon").The lunula is most prominent in the thumb, although it may be absent in the little finger[7].

The skin underneath the nail plate is known as the nail bed. It, like all skin, is made up of two kinds of tissues: the deeper dermis, which is made up of live tissue such as capillaries and glands, and the epidermis, which is made up of dead tissue[8][9]. The epidermis is the layer immediately under the nail plate that travels along the plate toward the fingertip. Matrix crests are small longitudinal "grooves" that connect the epidermis to the dermis (cristae matrices unguis) [10]. The nail plate thins as people become older, and the grooves become more apparent[11].

When it comes to growth the development of nails is an indication of eliminating dead cells from the human body[12]. The rate of growth of nails are higher in child's than young and elderly adults. Human nails and issues connected with it such as size, color and form of the nail will also reveal the kind of illness and problems associated with the body[13].

Figure 1 illustrates the human fingernail structure wherein the nail is situated at the distal portion of each finger, Nails (with hair sebaceous and sweat glands) are recognized to be appendages of the skin. Nails are the invagination of the outer layer of the skin, the Epidermis and comprised of extremely tiny cells, called oncocytes, which are primarily made up of keratin, a fibrous protein[14].

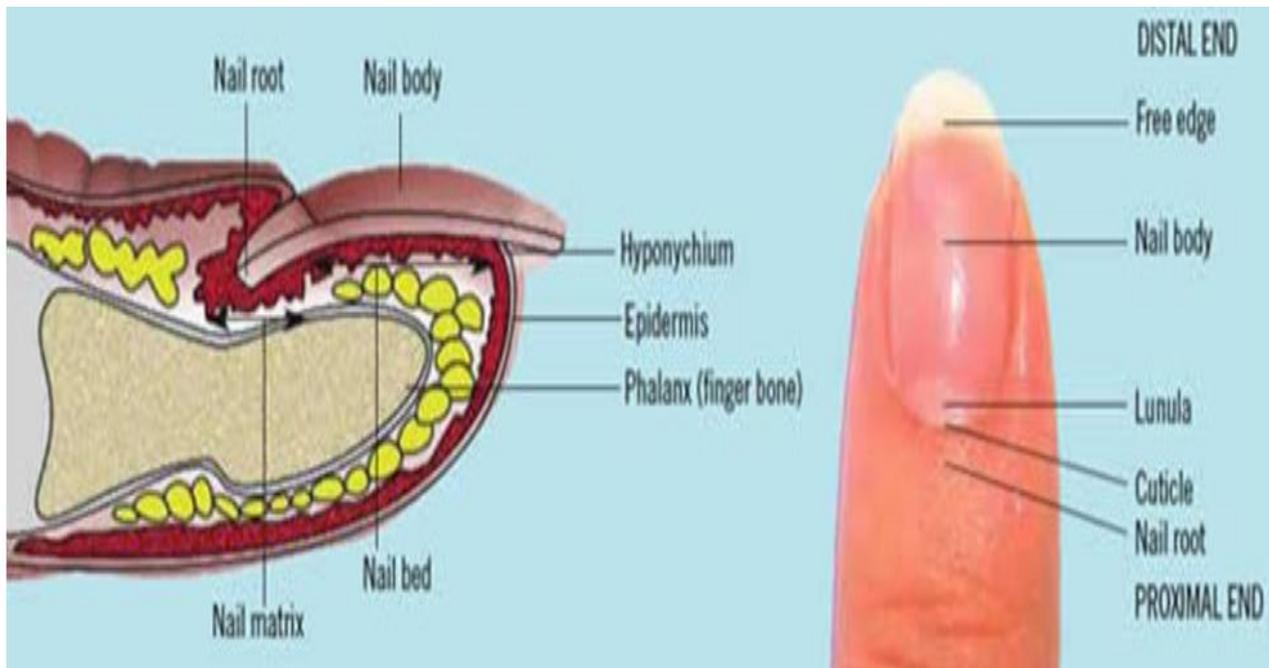


Figure 1: Nail Structure and Anatomy

Human nail is comprised of numerous components including a nail plate, nail bed, matrix, nail cuticle, eponychium, hyponychium, specific ligaments and nail folds[15]. The nail plate is more porous than skin, therefore water may flow through it more readily than through the skin. In this article talked about the nail bed, the nail bed is the live skin which is present within the nail plate or nail bed is the region on which the nail rests[16].

Nail structure and abnormality has been described in this article, nail matrix has also been mentioned in this paper nail matrix is a specialized epithelial structure which is exhibited below the proximal nail fold[17]. In this article I addressed lunula, which is a whit color clearly visible semi - circle shape (half moon) mark at the base of the nail plate. Mentioned what is cuticle and eponychium Usually, Cuticle and Eponychium cause misunderstanding with one other[18][19].

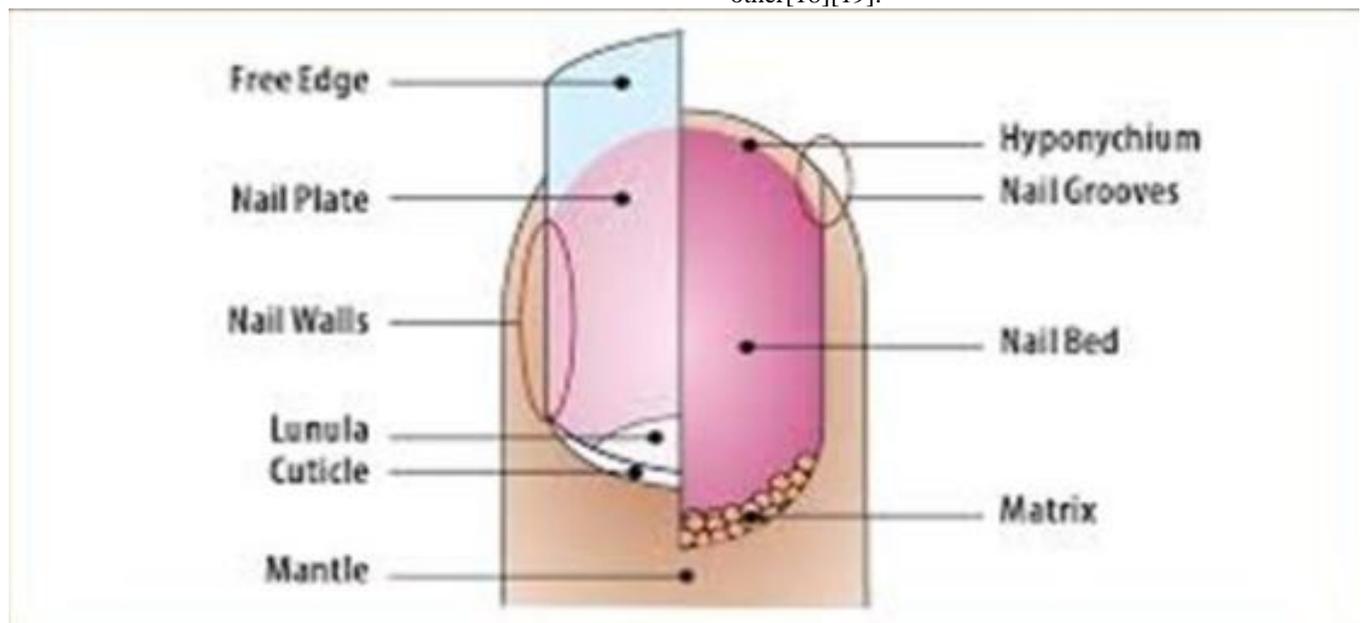


Figure 2: Human Nail Anatomy

Figure 2 depicts the nails sections, furthermore pH range of nail has been presented which changes according to the gender of individuals, pH value of nail also fluctuates according to the kind of job they perform. Gender affected the pH of unwashed nails - with women having lower pH compared to males - but had no effect on the pH of washed ones, indicating the involvement of an external factor. To

maintain the pH level of nail, users may wash the nail and occasionally dip their nails in acidic or base gel according to the requirement of the nail[20][21]. To preserve the pH value of nail first wash the nail with any liquid cleanser additionally nail may be cleaned by tap water, doing this can keep the pH value of nail, this method can alter the pH value of nail only for sometimes (20

minutes) [22]. Tape stripping the nail plates in order to test the pH of the nail plate interior showed a lower pH within the nail plate compared to its surface. In this research of nails it is demonstrated that the pH value of a nail plate may be calculated and to know the pH value of nail is important for health. The pH value of a nail may be measured by using the Courage & Khazaka skin pH meter, to conduct this procedure a lengthy and stabilising process is required[23][24].

## II. LITERATURE REVIEW

There was many publication papers in the field of nail shaper, nail design and nail chemical, also distinct paper has indeed been authored in the field of nails research, among the research study a research study titled A thorough examination on sentient nail by Vivek Kumar, Sangeet Sharma, Naveen, Pawan Jalwal discussed about the Framework and Anatomy of Human nail, nail structure, synthetic presents throughout nails and situation of nail polish can be able to locate out the disease associated with body, nail act as an indicator of body. In this article I examined the nail plate and provided the result that the nail is the hard transparent, visible component of the nail is known as nail bed and that bed is of keratin. Proximally and laterally the nail plate is encompassed by the nail folds that covers its proximal and lateral borders. The nail plate is more porous than skin, therefore water may flow through it more readily than through the skin. In this article talked about the nail bed, the nail bed is the live skin which is present within the nail plate or nail bed is the region on which the nail rests.

Nail structure and abnormality has been described in this article, nail matrix has also been mentioned in this paper nail matrix is a specialized epithelial structure which is exhibited below the proximal nail fold. In this article I addressed lunula, which is a whit color plainly visible semi - circle shape (half-moons) mark just at base of the nail plate. Mentioned what is epidermis and eponychium Generally, Integument and Eponychium cause misunderstanding with one other. They are not the same. There are several specialized ligaments present in the nail and described the specialist ligaments is a tough ring of fibrous tissue that connects the fingernail bed and matrix bed to the underlying bone. In this paper start debating the function of nail, like where nail used and what is the function of nail, what is Hyponychium and what cause serious damage of the tissues and cells, body is unable to produce is perhaps the most remote, soft, slightly thickened layer of skin that is located between the fingertip as well as the free corner of nail plate and formation a waterproof protective barrier preventing microorganisms from overrun and infecting nail bed [25].

Discussed what's really nail fold, nail fold is a fold of normal skin which covers the nail plate and creates the nails slot which ruts on the side wall of nail plate. Also discusses the significance of nails in treatment of various types of illnesses, form, color and nature of the nails also speak about the health and cleanliness of a person. Nails are checked regularly by the physicians to obtain some information regarding illness. Nails can consist of bacteria and harmful chemicals inside the nail that make nails unclean and that occurs primarily in case of children since youngsters can contact nasty and filthy items. Color of the

nail determines the state of health and this also has been addressed in this paper .

A study article titled An evaluation of the human nail plate pH by S Murdan\*G Milkovich and G S Goriparthi discussed Purpose of study: To test the pH of the surface of healthy nail plates, also talked about the process of finding the ph of human fingernails and large toenails, and ph measurement of the skin is by using ph meter, In this article I examined the nail plate and provided the result that the nail is the tough translucent, visible part of the nail is known the nail bed and that bed is of keratin.

Proximally and laterally the nail plate is encompassed by the nail folds, which cover its proximal and lateral borders. The nail plate is more porous than skin, therefore water may flow through it more readily than through the skin. In this article talked about the nail bed, the nail bed is the live skin which is present within the nail plate or nail bed is the region on which the nail rests. Nail structure and abnormality has been described in this article, nail matrix has also been mentioned in this paper nail matrix is a specialized epithelial structure which is exhibited below the proximal nail fold. In this article I addressed lunula, which is a whit color plainly visible semi - circle shape (moon) mark at the base of the nail plate. Discussed what is cuticle and eponychium Generally, Cuticle and Eponychium cause misunderstanding with one other.

They are not the same. There are several specialized ligaments present in the nail and described the specialist ligaments is a tough ring of fibrous tissue that connects the nail bed and matrices bed to the underlying bone. On the grounds of nails color, texture and form it also detects the kind of issue connected with the body, and the outcome of the experiment also has been presented in this paper.

## III. DISCUSSION

The pH of the healthy nail plate surface was measured to be about 5 or 0.5 more or less than this value is acceptable. Some nails with higher pH of nail is also hazardous, for a healthy nail pH of nail should be 5 to 5.5 on that pH nail is appropriate for putting nail paint and nail paint remover on it with toes having considerably higher pH than fingernails. When it comes to the pH value of a nail then it has been observed that the pH value of ten finger nail is nearly comparable to the pH value of toenails.

Also pH range of nail has been demonstrated which changes according to the gender of individuals, pH value of nail also fluctuates according to the kind of job they perform. Gender affected the pH of unwashed nails - with women having lower pH compared to males - but had no effect on the pH of washed ones, indicating the involvement of an external factor. To maintain the pH level of nail, users may wash the nail and occasionally dip their nails in acidic or base gel according to the requirement of the nail.

To keep the pH value of nail first wash the nail with any liquid cleanser also nail may be cleaned by tap water, doing this can maintain the pH value of nail, this procedure can alter the pH value of nail only for sometimes (20 minutes) (20 minutes). In this research of nails it is demonstrated that the pH value of a nail plate may be calculated and to know the pH value of nail is important for health. The pH value of a nail may be measured by using the Courage & Khazaka skin pH meter, to conduct this procedure a

lengthy and stabilizing process is required. Nail is connected to the surface called nail bed however there is some part of the nail which does not enable measuring because of the health problem.

#### IV. CONCLUSION

In this article addressed the hydro power plant energy generation technique and its benefits, limitations and its applications at different locations. Hydro power plants come in usage in every nation, furthermore it is proved that hydro power plants are extremely beneficial for urban as well as rural regions, when it comes for the development and prosperity of state or any country energy production for any state or country plays a very essential part. Rather to the set clash of nuclear vs. nuclear free policy there is a natural type of energy gathering with little or no pollution. When it comes to hydro energy it is a highly renowned technology which is extremely near to the imagination of a wide spectrum of the people. Hydro power plant is a renewable energy resource (RES) and availability of its primary energy source which is water is frequently accessible. Hydro power system is an energy storage technique and also it may convert energy from one part to another, in urban settings its primary motivation is sustainable development. This article explained the technology behind hydro power plant, turbines utilized in hydro renewable energy sectors. It shows that hydro is a significant sector of the electric generating power plant which has proven itself as a wonderful energy resource globally, in this article also addressed the advantages of hydro power plants on the environment and economics of that area [14].

#### REFERENCES

- [1] Sowe SK, Simmon E, Zettsu K, De Vault F, Bojanova I. *Cyber-Physical-Human Systems: Putting People in the Loop*. IT Prof. 2016;
- [2] Bakin NN, Tuyev VI, Yauk EF. LED lighting. In: 12th International Conference and Seminar on Micro/Nanotechnologies and Electron Devices, EDM'2011 - Proceedings. 2011.
- [3] Rosenfeld A, Richardson A. Explainability in human-agent systems. *Auton Agent Multi Agent Syst*. 2019;
- [4] Bounds Huang YP. LCD TV. In: SID Conference Record of the International Display Research Conference. 2008.
- [5] Calvin K, Bond-Lamberty B. Integrated human-earth system modeling - State of the science and future directions. *Environ Res Lett*. 2018;
- [6] Atmel. ATmega48A/PA/88A/PA/168A/PA/328/P DataSheet. AVR Microcontrollers. 2015;
- [7] Krugh M, Mears L. A complementary Cyber-Human Systems framework for Industry 4.0 Cyber-Physical Systems. *Manuf Lett*. 2018;
- [8] Robinson S ann, Wren C. Geographies of vulnerability: a research note on human system adaptations to climate change in the Caribbean. *Geografisk Tidsskrift - Danish Journal of Geography*. 2020.
- [9] Abdullah R, Abdul Rahman MN, Salleh MR. A systematic approach to model human system in cellular manufacturing. *J Adv Mech Des Syst Manuf*. 2019;
- [10] Trentesaux D, Karnouskos S. Engineering ethical behaviors in autonomous industrial cyber-physical human systems. *Cogn Technol Work*. 2021;
- [11] Roundtree KA, Goodrich MA, Adams JA. Transparency: Transitioning From Human-Machine Systems to Human-Swarm Systems. *J Cogn Eng Decis Mak*. 2019;
- [12] Brodin P, Davis MM. Human immune system variation. *Nature Reviews Immunology*. 2017.
- [13] Kukla C, Pichl W, Prokesch R, Jacyniak W, Heinze G, Gatterer R, et al. Femoral neck fracture after removal of the standard gamma interlocking nail: A cadaveric study to determine factors influencing the biomechanical properties of the proximal femur. *J Biomech*. 2001;
- [14] Sangiorgi S, Manelli A, Congiu T, Bini A, Pilato G, Reguzzoni M, et al. Microvascularization of the human digit as studied by corrosion casting. *J Anat*. 2004;
- [15] Burgess-Limerick R. Human-Systems Integration for the Safe Implementation of Automation. *Mining, Metall Explor*. 2020;
- [16] Ren X, Shen J, Tran P, Ngo TD, Xie YM. Auxetic nail: Design and experimental study. *Compos Struct*. 2018;
- [17] Hocraffer A, Nam CS. A meta-analysis of human-system interfaces in unmanned aerial vehicle (UAV) swarm management. *Applied Ergonomics*. 2017.
- [18] Salomon J, Szepietowski JC, Proniewicz A. Psoriatic Nails: A Prospective Clinical Study. *J Cutan Med Surg*. 2003;
- [19] Pongsakornsathien N, Lim Y, Gardi A, Hilton S, Planke L, Sabatini R, et al. Sensor networks for aerospace human-machine systems. *Sensors (Switzerland)*. 2019;
- [20] Kirwan M, Dokal I. Dyskeratosis congenita, stem cells and telomeres. *Biochimica et Biophysica Acta - Molecular Basis of Disease*. 2009.
- [21] Jiang K, Lepak DP, Han K, Hong Y, Kim A, Winkler AL. Clarifying the construct of human resource systems: Relating human resource management to employee performance. *Hum Resour Manag Rev*. 2012;
- [22] Romero E, Francisco D. The NASA human system risk mitigation process for space exploration. *Acta Astronaut*. 2020;
- [23] McLean AJ. pH Meter. *Acad Psychiatry*. 2017;
- [24] Alves da Costa T, Lang J, Torres RM, Pelanda R. The development of human immune system mice and their use to study tolerance and autoimmunity. *Journal of Translational Autoimmunity*. 2019.
- [25] Fan CC, Luo JH. Numerical study on the optimum layout of soil-nailed slopes. *Comput Geotech*. 2008;