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Health Advice and Guidance on Thalassemia and Pneumonia in a Kenyan village setting

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ABSTRACT

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In remote areas, access to primary healthcare might be limited and underfunded. This may cause disproportionate death due to preventable and treatable disorders, like pneumonia. There may also be little awareness about conditions, like thalassaemia, that may be common amongst certain populations. Thus, through a low-cost and versatile tool of health-promoting posters, the most important information can be conveyed to affected communities. Education is a means to prevent illness, keeping morbidity at bay – lowering future treatment expenditure. Equipping communities with potentially life-saving awareness can also be an empowering act.

The purpose of the thesis is to produce informative health posters about thalassaemia and pneumonia for Home Street Home families with children. The objective is to enhance awareness and understanding of pneumonia and thalassaemia, encouraging early detection and treatment seeking, thus reducing morbidity and mortality, as well as reducing the risk of complications.

The thesis' client - Home Street Home (HSH) - is a Finnish Kenyan organization. HSH places great focus on helping children and young people by making education and nutrition accessible. The target group for this project was children and their guardians in the village of Makongeni.

The method used in this project was the Waterfall. In this method, the stage needs to be completed before the next one can be approached. The project contained three major stages that had to be accomplished, with each stage having its own list of tasks, for example planning, researching, correcting, communicating with stakeholders, and designing.

As a result of the project, four posters were created, two for each disorder, which were revised and adapted according to feedback from stakeholders, improving their visuals, accessibility, and the information provided. The latest feedback we received indicated that we had succeeded in making the posters visually appealing, informative, and understandable to the audience.

Despite the prevalence of thalassaemia, the authors noted a disproportionately low level of awareness about this disease. Equally important is the fact that the usual symptoms of the disease that may manifest in patients do not always correspond to books due to the patient's gender. Therefore, more research is needed to take this into account.

Keywords: Thalassaemia, Pneumonia, Poster, Families.

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1 INTRODUCTION

Lower respiratory tract infections are a major cause of morbidity and mortality worldwide that affects people of all ages, especially vulnerable groups such as children and the elderly. In 2019 alone, pneumonia killed more than 740 180 children under the age of 5 worldwide, accounting for 14% of all deaths amongst children under 5 years of age. This makes pneumonia disproportionately deadly to children compared to how preventable and treatable the disease is, even with low-cost, low-tech measures such as breastfeeding infants, hygiene measures, and vaccination. Sub-Saharan Africa can be particularly vulnerable to pneumonia due to crowded housing, malnutrition, and poor air quality. Kenya is one of the countries that has prepared a plan to control pneumonia among its population. (World Health Organization, 2022.)

On the other hand, thalassemia is a genetic disease, making its prevention approach different from pneumonia's. Although thalassemia can be managed, it is considered incurable. This hematological disorder's mechanism causes a malfunction of hemoglobin, leading to juxtaposing extremes: chronic anemia and iron build-up in the organs. Both cause a further cascade of morbidities. Thalassemia can have various levels of severity depending on the type of thalassemia and how strongly the genetics of the person are affected. Since thalassemia is a hereditary disorder, the only prevention available is avoiding procreation between two carriers. However, this is a challenging task, especially in certain regions, as up to 21.5% of the world population may be carriers of any type of thalassemia, with the majority concentrated in Africa and Southeast Asia. Since the condition often takes a mild or even symptomless course, lowcost management measures such as iron-free multivitamin supplements may be sufficient to aid healthy systemic functioning. An asymptomatic course of thalassemia is possible, with silent carriers being able to have no symptoms at all, or mild forms of thalassemia being found by accident when doing blood tests for other diagnostics. (Musallam et al., 2024.)

In this project, the focus revolves around pneumonia and thalassemia among families with children. The topic was chosen due to the number of deaths

caused by pneumonia, of which a great deal can be prevented by educating children's guardians. Similarly, early detection of thalassemia can help manage the condition before it damages bodily organs. The project intends to design informative posters for families. Poster format is one of the most cost-effective methods to spread information and educate people about maladies, which can contribute to their prevention and management, and so to lowering morbidity and even mortality. (Hasanica et al., 2020.)

The thesis' client - Home Street Home (HSH) - is a Finnish Kenyan organization established in 2014. Co-founder & volunteer Viola Wallenius is the contact person in this project from HSH's side. HSH specializes in empowering and supporting the local community of Makongeni by providing children with hot meals, access to education through textbooks and trade training, as well as providing basic healthcare in their newly established healthcare center. (Home Street Home Ry, 2023.)

Hence, the purpose of the thesis is to produce informative, health-promoting posters about thalassemia and pneumonia for families with children attending HSH facilities. Posters intend to explain the overview of the conditions, their symptoms, complications, treatments or management, and means of prevention. The aim is to enhance awareness and deepen understanding of pneumonia and thalassemia, thus aiding with self-detection and encouraging seeking treatment faster, with the intention to reduce morbidity and mortality.

2 THEORETICAL BACKGROUND

The key concepts in this project are thalassemia, pneumonia, health posters, and families with children.

2.1 Thalassemia

Thalassemia is a genetic and lifelong hemoglobin dysfunction causing abnormally low hemoglobin levels; thus, red blood cells are unable to carry the required amount of oxygen, leading to chronic anemia. (Bajwa H, 2023.)

Hemoglobin (Hb) is an iron-containing protein in red blood cells, responsible for the transport and delivery of oxygen throughout the body, which is essential for metabolic life processes. Hemoglobin contains two types of globin protein: alpha (α) and beta (β) (Lu et al., 2023). The identification of the type of thalassemia depends on which of these two globin genes presents a mutation. Generally, type alpha is more predominant than beta, with 5 – 20% of the world's population being a carrier of one or more α -Thalassemia mutations, compared to approx. 1.5% of the β -Thalassemia. Thalassemia is prevalent in different geographical locations, with the common factor amongst them being hot climates with a prevalence of malaria, as thalassemia acts protectively against malaria. (Musallam et al., 2024.) Aside from genetic classification into alpha and beta, thalassemia is also classified by symptom severity and the need for treatment: trait, minor, intermediate, and major (Tarim & Fatma Öz, 2022).

Additionally, certain thalassemia types are more popular in different regions; for example, Saudi Arabia, the United Arab Emirates, and Iraq have a higher prevalence of β -Thalassemia, juxtaposing with the general trend (Odha et al., 2023). However, due to human migration, thalassemia is also occurring in nontropical countries usually not affected by malaria, for example, Europe and the United States of America. Currently, thalassemia is the most common cause of anemia in the Mediterranean region. (Tarim & Fatma Öz, 2022.) In

the Kenyan context, the prevalence of hemoglobinopathy (pathologies of hemoglobin, which include thalassemia as well as sickle cell disease) presents itself in a pattern of abode distance from Lake Victoria (Mutua et al., 2022). The type of thalassemia prevalent in Kenya seems to be α -thalassemia, as only a handful of (0.6%) of studied participants in Kilifi, Kenya, presented β -thalassemia, with no report about children with β -thalassemia major anywhere on the East African coast (Macharia et al., 2020).

2.1.1 Symptoms

Many of the α -thalassemia cases may be asymptomatic, leading to the discovery of the condition when undergoing laboratory blood tests (Musallam et al., 2024). However, symptoms may range depending on the severity of the globin gene mutation. Carriers have no symptoms, but present $\frac{1}{4}$ gene deletions, which may also manifest in offspring if the second parent has any type of thalassemia. Trait α -thalassemia (also called minor) presents $\frac{1}{2}$ gene deletions and is asymptomatic, but presents microcytosis (abnormally small red blood cells) and potentially mild anemia. Thalassemia minor can be a result of two carriers having a child together. Thalassemia intermedia presents $\frac{3}{4}$ gene deletions and causes moderate anemia, ineffective red blood production, and skeletal abnormalities like osteoporosis, osteopenia, abnormal facial bone presentation, and short posture. Lastly, thalassemia major presents all 4 gene deletions, causing non-immune hydrops fetalis (blood accumulation in the bodily cavities of a fetus), which is usually fatal without blood transfusion treatment. (Baird et al., 2022.)

The symptoms that may cause concern amongst the parents of children with undiagnosed thalassemia, including the ones attending our subscribers' day clinic in Makongon, are likely to be the initial signs of anemia, as these are relatively easy to notice. However, they are also prone to being misdiagnosed as other conditions. These include fatigue, light-headedness, and fainting. Additionally, skeletal changes may also occur, of which visibility doesn't require specialized tests to notice, suggesting a more severe type of thalassemia.

These include abnormally poor growth, a protruding forehead (bump), a lowered bridge of the nose, scoliosis of ribs, enhanced upper jaw that may cause exposure of upper teeth, a severe overbite, small teeth, difficulty eating and speaking, puffiness around eye sockets, sensation of burning in the mouth and swollen or inflamed tongue, and a general pain of the face caused by low hemoglobin. To make this facial structure easier to visualize, it may be described as “chipmunk-like” due to enlargement in certain areas of the face and exposure of the upper teeth. (Baird et al., 2022; Raveendran & Dungarwalla, 2022.)

2.1.2 Complications and prevention

Thalassemia causes iron buildup in the body; thus, it can lead to an overload of iron deposits in the organs, leading to systemic complications stemming from the affected organ. For example, when iron deposits are found in the pancreas, it is a great predictor of glucose metabolism and thus the development of diabetes. Additionally, it is a predictor of cardiac complications. The latter is a major factor in the increased morbidity of people with thalassemia. (Pepe et al., 2020.)

Morbidity of thalassemia differs as per every organ affected by the iron deposits. Thus, it is important to notice that thalassemia can affect the whole body and is not limited to anemia only. Hence, it should be approached holistically, as the complications may severely change daily functioning or even pose a threat to life. Thalassemia-caused complications may include gallstones, hypothyroidism, abnormal liver function, advanced liver fibrosis, elevated levels of transaminase liver enzyme, cirrhosis, kidney stones, pulmonary hypertension, blood clots, low bone density (osteopenia), and high uric acid levels. (Musallam et al., 2024.)

2.1.3 Treatment, management, limitations

The thalassemia, unless the person presents with anemia, does not need specific treatment apart from recommended regular monitoring. General

advice for people with α -thalassemia includes intake of folic acid in a dose of up to 5 mg/day, vitamin D, antioxidants such as vitamin E in a dose of 10U/kg/day with an intention to offset oxidative stress, calcium, and zinc to support bone marrow, which is crucial for red blood cell metabolism. These can be easily supplemented with simple multivitamin tablets. However, it is important to exclude iron due to the risk of iron overload due to thalassemia causing an imbalance in the red blood cell ratio.

Thalassemia can lead to two juxtaposing conditions – iron overload and anemia – making treatment challenging, almost circular in its sequence, as treating one causes another. Iron overload is treated with iron chelation, which means a binding medicine is administered to attach to the iron and make it possible for the body to excrete it with feces. Deferoxamine is a first-line treatment approved worldwide for iron chelation in patients with chronic anemia, making it suitable for patients with thalassemia. Chronic anemia caused by thalassemia major is treated with blood transfusions. However, blood transfusions in thalassemia are a chronic treatment, thus endangering the person to higher morbidity due to secondary iron overload. It is also a resource-intensive treatment. (Musallam et al., 2024.) Management of these two primary conditions is the biggest factor in turning thalassemia into a chronic rather than fatal condition (A. Kattamis et al., 2020).

However, blood transfusions in Kenya are not easy to obtain, and the country struggles with shortages of blood units, equipment, funding, and staff. In some regions, blood banks can collect only half of the amount of blood needed (Kavulavu et al., 2022). Additionally, although blood transfusion is an essential part of healthcare and is taught in medical schools, Kenyan clinicians acknowledge the need to receive more specialized training when discussing the current curriculum on blood transfusions (Kipkulei et al., 2023). Just as with any other treatment, patients receiving blood transfusions must be aware and educated about adverse effects and give informed consent. When administering a blood transfusion, it's essential to check on the patient to monitor potential reactions. The promptness with which the blood is administered to the patient after it has arrived from the laboratory must also be observed. Some Kenyan studies suggest these elements of the blood

transfusion process are insufficient in quality, despite their significant impact on patient safety (Veronica & Godfrey Mayoka, 2023). Additional factors negatively affecting patients in need of blood transfusion in Kenya are the distance to the nearest health unit and barriers to obtaining reliable transportation. These factors especially affect the rural parts of the country (Mumo et al., 2023).

2.1.4 Prevention

Thalassemia is a genetic disorder; thus, the only prevention available is awareness of both potential parents about being affected by the gene deletion responsible for thalassemia. This can be done by genetic screening and counselling, and prenatal diagnosis of the fetus. Most importantly, educating and raising awareness about the disease and how it is passed down is crucial in preventing its occurrence. Such strategy achieved success in countries like Italy (Sardinia), Cyprus and Greece. In the latter, it was made compulsory to take genetic testing before marrying in an orthodox church. Regardless of the test result, a couple could still proceed with marriage, but with the awareness of potential outcomes. (Alam et al., 2022.)

However, although premarital testing brought a decreasing trend of thalassemia occurrences within the Mediterranean region, in other regions where the disorder is reported, people refuse to do the same. The trend of refusing to undergo premarital genetic testing is noticeable in the regions presenting with lower education and strong religious customs. People from this background tend to refuse testing because it is believed that they have no power over the decision the supreme being bestows upon them; hence, they proceed with the marriage between two thalassemia-positive blood relatives. Additionally, lack of education and financial constraints were also major factors mentioned when refusing genetic screenings. (Suresh et al., 2023.)

2.2 Pneumonia

Pneumonia is a common but serious lung infection, leading to significant morbidity and mortality around the globe, particularly among children, the elderly, and other immunocompromised groups. It occurs when the pathogens, often from the nasopharynx or airborne droplets, infect the lower respiratory tract, causing inflammation and fluid accumulation in one or both lungs. As a result, the lungs cannot function properly, which means that the body receives less oxygen than it needs. Thus, if pneumonia is not treated properly, it can lead to serious complications and even death. Therefore, it is important to raise awareness about this disease. (Pates et al., 2023.)

2.2.1 Types of Pneumonia

Depending on the site of infection, pneumonia is divided into two main types: community-acquired pneumonia (CAP) and hospital-acquired pneumonia (HAP). CAP accounts for the largest proportion of pneumonia cases. CAP is an infection of the lower respiratory tract that occurs without recent contact with a healthcare facility. HAP, on the other hand, is directly associated with hospitalization. HAP is caused by a different spectrum of pathogens, which is reflected in differences in clinical severity and manifestations of pneumonia from CAP. For example, HAP is often caused by Gram-negative and multidrug-resistant organisms, which makes it more difficult to treat than CAP. Patient-related factors also influence the course of the disease. (Pates et al., 2023.)

2.2.2 Pneumonia-causing pathogens

Pneumonia is caused by microorganisms, such as bacteria, mycobacteria, viruses, and fungi. In most instances, the elevated levels of certain white cell types reflect the pathogen that caused the infection. For example, elevated levels of neutrophils are caused by bacteria, elevated lymphocytes by viruses, and granulomatous inflammation is due to mycobacterial and fungal infections. (Pates et al., 2023.) Knowing what caused the pneumonia is essential to

ensuring timely and effective treatment (Pahal et al., 2025). Bacterial and viral pneumonia are more common, while fungal pneumonia is less common and mostly affects people with immunodeficiency (Rider & Frazee, 2018).

Aspiration pneumonia is a type of pneumonia caused by foreign substances, such as food or even vomit, entering the lower respiratory tract. In most cases, aspiration pneumonia begins on the right side, as the right bronchus is anatomically wider than the left. Because of this, foreign objects most often enter the right lung during inhalation. (Lim, 2022.) There are factors that increase the risk of aspiration. These include conditions such as cerebral vascular disorders, oesophageal diseases, and neuromuscular disorders. Elderly people and children under 5 years of age are also at risk. (Rider & Frazee, 2018.)

2.2.3 Symptoms and Complications

The symptoms of pneumonia vary depending on factors such as the causative agent and the severity of the infection. However, the most common symptoms include a productive cough, dyspnea (shortness of breath), chest pain, fever, fatigue, headache, and lack of appetite. Haemoptysis (coughing up blood) is also a fairly common symptom. In infections caused by *Streptococcus pneumoniae* bacteria, rusty sputum and chills are common, while atypical infections tend to cause more general symptoms like myalgia (muscle aches), headaches, and digestive issues. However, although these signs are a great hint, they cannot be used as a sole source of diagnosis. In further examination of pneumonia symptoms, such as fever, tachypnoea, tachycardia, and even altered mental status, can occur. Listening to the chest sounds is also a crucial part of the examination, and the sounds produced may vary. They include a dull sound of the affected lung part when using the percussion technique due to the density of affected tissue, crackles, bronchial breathing if heard at the peripheries of the lungs, and wheezing due to decreased airflow. (Mani, 2018.)

Acute complications of pneumonia can be caused by both CAP and HAP. Despite the simplicity of the infection, the complications can be severe, complex, and even fatal. They include bacterial parapneumonic effusion (build-up of fluids in the pleural space), empyema (pockets of pus that gather in body cavities), necrosis of the lung tissue, pneumatocele formation (cysts filled with gas), and lung abscesses. (Pates et al., 2023.)

Pneumonia can also cause sepsis, acute respiratory distress syndrome (ARDS), and distal spread of the infection to other areas such as the pleura (causing empyema), joints, heart, or even the central nervous system. Sepsis is one of the deadliest potential complications, and a person's survival depends on the prompt recognition of symptoms and treatment. Signs of sepsis include rapid breathing (tachypnoea) with a respiratory rate of 22 breaths per minute (in adults), altered mental status, hypotonia (lowered muscle strength), and hypotension with a systolic blood pressure of 100 mmHg. If such symptoms are present, medical help should be immediately notified, and septic-specific treatment should be administered urgently. (Pates et al., 2023.)

Whether due to sepsis or pneumonia, an abnormally low level of oxygen in the blood (hypoxemia) is a critical cause for hospitalization and a factor in determining survival. Specifically in children, oxygen saturation levels below 92% are associated with a significantly increased risk of mortality. Indications of low blood oxygen are cyanosis (blue skin and lips), rapid respiratory rate (>70 breaths/min in an infant or >50 breaths/min in a child), apnea, dyspnea, expiratory grunting, dehydration, lack of appetite, recurrent pneumonia, and a general altered state of a child, suggesting lack of energy. (Mani, C.S. 2018.)

2.2.4 Diagnostics and treatment

Diagnostics of pneumonia involve four aspects, such as symptoms and signs of a respiratory tract infection, radiological changes, identification of the pathogen, and the treatment response, consistent with pneumonia (Lim, 2022). The diagnosis is confirmed by lung imaging and laboratory tests. Radiography is indicated to confirm the presence of pneumonia and identify its location. Due to radiation exposure, follow-up radiography is recommended only for

persistent lung collapse, complicated, recurrent or round pneumonia, and to exclude a tumor as the cause of the symptoms. (Mani, 2018.)

Identification of what causes pneumonia is crucial for the best and targeted treatment, but it is difficult without invasive methods. Infections presenting with mild to moderate cases can usually be treated without a specific diagnostic test. However, in more complex and high-risk cases, such as whether a patient is hospitalized, has comorbidities, or is in a case of an outbreak caused by a potential new agent. To confirm the cause of the infection, multiple tests may be needed, making such process time and resource-intensive. Hence, in outpatient cases, such steps are not needed. (Mani, 2018.)

However, it is still important to determine the severity of a person's pneumonia to prevent escalation of the infection. It also helps determine the appropriate treatment setting (outpatient, hospital, or intensive care), how many investigations are needed, as well as the urgency and the type of treatment. It can even determine the course of the treatment, that is, what antibiotics should be used and in what way they should be administered for the best and most prompt results. (Lim, 2022.)

The treatment of pneumonia depends heavily on the patient's comorbidities and overall health, risk factors, infection's severity, and local antibiotic resistance patterns. The purposes of the therapy are the eradication of infection and the return of the balanced movement of pleural fluid, which is synonymous with healthy pulmonary function. If the initial pharmacological therapy fails, pneumonia can even be treated with procedures, depending on the age of the patient, the amount of accumulated fluid, respiratory distress severity, loculation, and failure of the initial medical therapy. Supportive pharmaceutical care must be implemented early to help the patient with experienced symptoms and to support their body in fighting the infection. This utilizes antipyretics, analgesics, oxygen supplementation, as well as fluid therapy. Patients with pneumonia must be monitored closely to identify potential deterioration and to prevent complications such as central respiratory depression from excessive analgesics or fluid overload related to Schwartz-Bartter syndrome. (Mani, 2018.)

2.2.5 Recommendations for people with pneumonia symptoms

Nowadays, pneumonia is easily treatable, but the mortality rate remains high. One of the reasons for this is delayed treatment. That is why, if you suspect pneumonia, do not delay and see a doctor as soon as possible. It is also important to follow the doctor's instructions. Take the prescribed medication on time and do not ignore their advice. If pneumonia has already been diagnosed, here is some advice for a faster recovery. (World Health Organization, 2022.)

During illness, it is essential to maintain a balanced diet and drink sufficient fluids. As mentioned earlier, one of the common symptoms is loss of appetite. Because of this, most patients experience a decrease in muscle mass, which negatively affects the course of the disease. That is why it is necessary to pay special attention to your diet during illness. A balanced diet with sufficient macro- and micronutrients will promote faster recovery. (Cereda et al., 2021.) An integral part of a healthy diet is also taking enough fluids (≥ 1.5 L fluid/d). Drinks that can be consumed include not only clean water but also juices and warm drinks such as tea and broth. However, alcohol should be avoided during illness and for some time afterwards, as it only slows down recovery and can cause some complications. (Hooper et al., 2022.)

Gradually increasing physical activity promotes faster recovery. There is no need to do intensive exercises; at the beginning, it is enough to spend 20 minutes out of bed and then slowly increase this time. A short walk or even just going into another room will suffice at first. Fresh air promotes faster recovery, so it is advisable to ventilate the room from time to time. But it is important to remember that to effectively fight the disease, your body needs sufficient rest. Early mobility speeds up recovery, but you should not exhaust yourself with heavy physical activities. Quality sleep will help your body recover faster. (Sattaret al., 2024.)

2.2.6 Risk factors

The entry of microorganisms into the body does not always mean illness. Our immune system destroys pathogens that enter our body. However, certain

factors weaken our immunity, making us more vulnerable to disease. People with risk factors often experience more severe symptoms. In the case of pneumonia, high-risk groups include children under 5 years of age and the elderly, people with chronic diseases, especially respiratory diseases such as asthma, and people with immunosuppressive disorders such as HIV. An unhealthy lifestyle also increases the risks. (Lim, 2022.)

In pediatric cases, factors increasing the risk of developing lower respiratory infections (LRI) are indoor crowding (such as in kindergarten or school), exposure to smoke, missing full vaccination course, alcohol abuse (especially in adolescents, as it may lead to aspiration pneumonia), and underlying health conditions such as low birth weight, bronchopulmonary dysplasia, asthma, heart diseases, seizures, neuromuscular illnesses, gastroesophageal reflux disease, malnutrition, immunodeficiency, sickle cell disease and cystic fibrosis. In children under 5 years old, other risk factors include a history of frequent upper respiratory infections, wheezing, and an earlier occurrence of otitis media requiring tympanocentesis before the age of 2. For children over the age of 5, risk factors also include wheezing and having frequent upper respiratory infections, defined as 3 or more within a year. (Mani, 2018.) Thus, it's important to remain vigilant when investigating pneumonia in severely immunocompromised patients, as they may lack many of the common symptoms associated with the severe course of illness (Lim, 2022).

2.2.7 Prevention

General preventive measures against pneumonia include minimizing exposure to tobacco smoke and air pollution, promoting breastfeeding, optimizing nutrition, supporting maternal health from pregnancy onward, ensuring adequate antenatal care, and improving socioeconomic and living conditions. Additional measures to prevent viral and bacterial transmission are proper hand hygiene, environmental decontamination, mask use, and the isolation of infected individuals. Preventive measures can also include vaccines outlined in the local immunization program schedule, isoniazid prophylaxis for tuberculosis, cotrimoxazole prophylaxis for HIV-infected infants and immunosuppressed children, timely HIV diagnosis, and the initiation of antiretroviral therapy (ART) where applicable. Most of the basic prevention

measures against pneumonia have a relatively low cost, and their prophylactic properties overlap with the common health promotion principles and thus help in countering other preventable conditions. (Zar et al, 2020.)

2.3 Healthcare posters

Healthcare posters are effective visual tools when used for education and raising awareness. To create an effective poster, few factors should be considered: the scope of the content, consistency, and visual aspects. To create an intriguing poster that grabs the viewer's attention, it should involve colors and be well-illustrated, with a clear message and a strong title. Understanding the purpose of the poster and who its target is is crucial for an appropriate design. (Gemayel, 2018). Even now, in the digital era, this approach remains important, particularly among adult populations (Barik et al., 2019). Additionally, to improve efficiency and the impact the health posters might have, it is important that they are in a secure place for a longer period, specifically accessible to vulnerable populations and young people, rather than distributed randomly amongst the healthy population. Posters are a low-cost and cost-efficient means of spreading information, so if done effectively, they can significantly lower the future health expenditure. (Hasanica et al., 2020.)

2.4 Families with children

HSH has laid out strategic objectives for the period between January 2023 and December 2025, with four out of five of them being focused on children. The first target is 'All children receiving a good quality education', the second being 'All children with special needs live a life with dignity', the third 'All children receiving equal opportunities, and the last objective regarding children stating 'All children being able to access health care services'. The very last target of HSH is about their values: ethics, responsibility, and transparency. (Home Street Home Ry, 2023.)

In summary, the main concepts revolving around the HSH mission towards children are education, dignity, equality, accessibility, and medical care. Project

work should also reflect the qualities and values of the organization by acknowledging that the posters can have a profound impact on health awareness within the community, helping them to spot the symptoms amongst their children early and seek medical help promptly. Hence, transparency and the traceability of the sources are of foremost importance. HSH objectives for the years 2023-2025 meet the principles laid out by WHO regarding children's well-being. WHO states that children require a stable environment that would encourage them to thrive, grow, and have accessible opportunities, providing nutrition and access to healthcare, access to opportunities to learn and grow, as well as protecting the children from threats. WHO also states that investing in children is the most important thing not just families, but entire societies can do to improve their future. (World Health Organization, 2019.)

2.5 Project methodology

The method selected for this project is the Waterfall model. This approach is chosen due to its structured and linear nature, which can be particularly suitable for projects with well-defined requirements and clear aims. (Kerzner, 2017.) The Waterfall model is characterized by its sequential phases, where each phase—analysis (planning), design, implementation, testing, and maintenance—must be completed before progressing to the next. This ensures a systematic and disciplined approach to project execution, minimizing uncertainties and helping clear milestones for progress evaluation. (Senarath, 2021.)

The decision to adopt the Waterfall method is further supported by its emphasis on thorough documentation and upfront planning, which aligns with the project's need for clarity and predictability. Unlike iterative methodologies, such as Agile, the Waterfall model is particularly effective for projects where changes during the development process are unlikely or undesirable. Hence, it is appropriate for the project to use it, as each of the stages needs to be finalized before students are allowed to proceed to the next step. (Kerzner, 2017.)

2.6 The earlier studies and projects on the topic

The information retrieval used in the project was done with databases such as Google Scholar, ScienceDirect, and PubMed. The inclusion criteria were articles no older than 10 years, with free access, and the language of publication was English. Exclusion The criteria were the articles in languages other than English, and if the research was done, specifically on the geriatric population.

More detailed data search and results in attachments 1 and 2.

Based on the studies selected in the articles, posters have been identified as an effective tool for raising awareness among families with children, particularly in health promotion and disease prevention. Posters are a cost-effective method of health promotion. Compared to other forms of media, posters require minimal resources to produce and distribute, making them an accessible tool for low-resource settings. (Hasanica et al., 2020.)

Posters are an important part of health promotion campaigns to educate caregivers about preventive measures. Posters that include actionable steps, such as vaccination reminders or hygiene practices, can empower families to take proactive steps in protecting their children's health. The posters will also help raise awareness of what pneumonia is, its symptoms, when to go to the doctor, and why it is important to seek it in time. (Zar et al., 2020.)

Articles mentioning the Kenyan or African context of the illnesses were prioritized to reflect the regional context of the diseases. Summarizing the results of the data research, it is quite visible that extensive research was made about thalassemia and pneumonia; however, only a few results talked exclusively about Kenya or about educating people without prior medical knowledge about these diseases. Additionally, one extensive source talked about preventing thalassemia through prenuptial and prenatal checks, their cost efficiency, and successful strategies from Europe and Asia, but excluded Africa, although this is where most of the alpha thalassemia cases are (Kattamis et al., 2020). One of the reasons why Africa is a hotspot for thalassemia is due to its climate, creating an optimal environment for malaria-

carrying mosquitoes. According to the findings, thalassemia may be a defensive mutation against malaria and thus appears in the regions and locations where disease-causing mosquitoes are prevalent. Even within a country, certain regions are more prominent than others; in Kenya, such locations are closer to Lake Victoria, which allows mosquitoes to thrive thanks to the still water source (Mutua et al., 2022). These findings are greatly educational about the context of thalassemia.

One previously done project was found in Theseus. It connects with our topic under the Finnish title “Milloin viedä lapsi lääkäriin? posterisarja alle kouluikäisten lasten malariasta, keuhkokuumeesta ja tuberkuloosista kenialaisille vanhemmille.” In this project, posters were made for the same organization – HSH. The posters from the earlier project educate about when it is necessary to take a child to the doctor. However, the diseases described were pneumonia, tuberculosis, and malaria. Thus, to reach families with children, it is important to make the posters educational, accessible, colorful, and attention-grabbing, with many visuals. (Behm et al., 2023).

3 PURPOSE AND OBJECTIVES OF THE PROJECT

The purpose of the thesis is to produce informative Health posters about thalassemia and pneumonia for HSH families with children. Posters would explain the overview of the diseases, their symptoms, complications, treatments or management, and means of prevention in simple terms.

The objective is to enhance awareness and understanding of pneumonia and thalassemia, encouraging early detection and treatment seeking, thus reducing morbidity and mortality, as well as reducing the risk of complications.

4 IMPLEMENTATION OF THE THESIS

4.1 Target group

The target group of this project was children and their caregivers in Makongen. Home Street Home places great focus on helping children by making education and nutrition accessible. The co-founder of HSH, Viola Wallenius, noted that local children are mostly under the care of their mothers. Whilst children are the main concern for HSH and thus the work should be focused on the pediatric perspective of pneumonia and thalassemia, educating mothers through readable posters is crucial for the project to effectively engage in its health promotion objective.

4.2 Proceeding of the project

For the project thesis, the Waterfall method was chosen. This model is characterized by its sequential phases, where each phase—analysis (planning), design, implementation, testing, and maintenance—must be completed before progressing to the next. This allows you to focus on one task, but it also has its limitations, such as the difficulty of returning to the previous stage if necessary. (Senarath, 2021.)

During the planning stage, the project requirements were defined. The client's wishes and expectations were identified. This stage also included the collection of theoretical data relevant to the project. The goal and objective were clearly defined, and research methods were selected. The time frame and expected results — informational posters — were also discussed and agreed upon.

During the design phase, decisions were made regarding the color scheme, structure, and graphic elements. At this stage, the client also provided us with access to CanvaPro, which was used to create the posters. During implementation, the first versions of the posters were developed based on the

material specified during the planning phase. After that, a meeting was held with the client and the teacher to discuss the points that needed to be changed. Then, based on this feedback, a second version of the posters was created. The text content was finally approved, and the graphics were inserted in accordance with the requirements.

During the testing phase, the finished posters were checked for informativeness, clarity, attractiveness, and ease of use. Feedback from our colleagues was collected and analyzed. Adjustments were made to improve the overall quality, resulting in the final version of the posters (see Appendix 3 and Appendix 4). During the maintenance phase, the final materials underwent a final review, were approved, and were prepared for distribution.

5 EVALUATION

5.1 Proceeding of the project

While working on this project, the authors significantly improved their information management skills. It is not enough to simply find the necessary information; it must also be critically evaluated and presented in such a way that it is understandable to a non-specialist audience with potentially basic education and reading skills. In addition, this was our first experience of creating work for a client. However, despite this, there were no problems in communicating with the client. The client gave us a clear task and explained what he expected from this project. When creating this project, we used Canva, which was also a first. This caused some difficulties at first, as we had to get used to and understand how to use it, but over time, the authors adapted. Overall, everything went according to plan. The final version of the posters was presented before the deadline. According to feedback from students, teachers, and the client, the posters were visually appealing, informative, attentioncatching, family-friendly, understandable, and easy to follow.

The resources available for this project consisted of two students, guided by a thesis mentor through the standard process of drafting a thesis. The students were given access to CanvaPro with HSH's design style and formats free of charge. Since the account was owned by HSH, Viola Wallenius had the possibility to oversee the design at any given time and provide feedback accordingly. The posters remained on the Canva account of the HSH, allowing for saving the posters in different formats and printing them at any given time in the future. This also prevents the file containing posters from getting lost, whether during the process of the thesis or in the future, by any stakeholder. Canva was found easy to operate, and corrections or sharing design elements between posters were catalyzing the design process. Overall, Canva was found much easier and pleasant to work with than initially expected, avoiding a big concern that was drawn up when planning the project.

Although the project didn't follow the initial planned timeline and some of the stages were delayed, the project did deliver the posters by the 30th of October as initially planned, and the first draft of the thesis was submitted before the 15th of November. The biggest obstacle and delay in the work was not the work or resources, but external factors, for example, personal circumstances, communication, and bureaucracy.

The waterfall method used in this project helped to keep the stages and tasks assigned to them in order and prevented disorganization and confusion. This became useful as the external workload of the students became significant at certain points of the project.

5.2 Students' feedback analysis and results

Feedback on the posters created for the project was collected from SAMK nursing students. Student feedback was collected to look at our work from a different angle and understand how we could improve it. We needed to evaluate both the visual component and the content after presenting posters during an online event that was held on the Teams platform. An anonymous survey was created on the Survey Sparrow platform, which was free to use for all parties. The access link was sent in the chat box of the meeting, and the student audience was encouraged to give their feedback, assuring their anonymity. The survey was completed by four responders out of six student participants present at the event.

The feedback survey contained twelve questions about the visual presentation of the posters, their educational contribution, accessibility, and effectiveness. The questions included numerical scale questions, "yes or no" questions, and open-ended questions.

Based on student feedback, the overall impression of the posters is positive, which is particularly noticeable in the open-ended questions; For example, in response to an open-ended question about overall feedback, we received answers such as "I like it," "Well done," and "Good presentation," indicating general satisfaction with the posters and the information they provided. The

feedback shows that the posters are visually appealing and that the images were used appropriately. The feedback also shows that the posters are quite informative and interesting, yet easy to read. At the same time, the open-ended questions show that thalassemia was of greater interest. The authors concluded that this is because pneumonia is a more common disease and, therefore, awareness of it is higher. In addition, in response to an open-ended question about how to improve the posters, it was noted that it would be desirable to provide more information about the treatment of pneumonia. The author took this into account and implemented this recommendation.

5.3 Self-assessment

The authors of the project remained self-aware about their shortcomings during the process, but worked independently on their parts and parts where they felt more confident. This allowed for the stronger skills of both students to be utilized in their own respective fields. The posters were also laid out independently, with only the template being designed by the student who has learnt how to utilize Canva more quickly.

6 ETHICAL CONSIDERATION

When compiling a project thesis and retrieving theoretical information to create a product, integrity and credibility are essential elements, as the outcome will be presented to the public. It is also important to respect the population involved in the project by obtaining informed consent and assuring confidentiality when receiving feedback from the community. (Kerzner, 2017.) These can be obtained by retrieving the information through credible sources and databases, such as PubMed or Elsevier, paraphrasing the data rather than directly copying them, referencing them appropriately, and giving credit to the original authors. To obtain informed consent from the community, giving feedback, it can be said that honesty is fully welcome because the feedback would be used to improve the posters and make them more suitable for the needs.

As this project is academic work, data fabrication and plagiarism are forbidden. It can be prevented by ensuring proper acknowledgment of all sources used and paraphrasing. The copying of works without paraphrasing also applies to Artificial Intelligence bots, which are detectable with the Turnitin program used by SAMK university, and that is available to students through Wihi. Therefore, before submitting work, we can use this tool to ensure there isn't any major plagiarism. It's important to acknowledge that Turnitin is sensitive and can highlight words that are references or citations, increasing the plagiarism score.

The Finnish National Board on Research Integrity (TENK) puts great pressure on responsible conduct of research (RCR) when retrieving information. Furthermore, TENK outlines that the thesis must have clearly defined objectives by the authors, report findings accurately without misrepresentation, and maintain methodology transparency (TENK, 2023). These ethical principles make the project contribute positively towards nursing knowledge, while participants' rights and dignity are safeguarded. Additionally, apart from Finnish TENK guidelines, the Ethical Guidelines for Nursing Research by the International Council of Nurses (ICN, 2021) can also be used for up-to-date

information about how to retrieve information whilst writing the thesis. It is also important that the authors of the thesis avoid any conflicts of interest and openly state their affiliations at the end of their work, assuring the work is objective and unbiased.

7 DISCUSSION

Authors of the project found the process interesting and self-growth inducing, as their knowledge about thalassemia and pneumonia, as well as Canva graphic design skills, has deepened. Thalassemia was previously an unknown condition to both students, and hence was a completely new field to explore for the student who was assigned to it. It has also raised the interest of multiple clinical placement mentors and other professionals when they have heard about thalassemia for the first time. Each time, it was highlighted that the reason why thalassemia is disproportionately unheard of despite its common occurrence is due to its prevalence being centered around the global south and hence pushed aside by the Americentric and Eurocentric attitudes. These are running deep in many institutions, thus affecting research, awareness, and funding. In fact, this was palpable during presenting posters to the students, where all respondents answered in the questionnaire that they hadn't heard about thalassemia before, despite all students in the audience coming from the global south. Even though the scale of this phenomenon was very narrow, it was very telling about the lack of awareness thalassemia receives due to its occurrence location on the map of the world's interests. Similarly, the number of deaths from pneumonia among Kenyans is disproportionately high simply because of a lack of awareness and resources, which delays treatment and condemns infants to deaths that could easily be avoided (World Health Organization, 2022).

The Eurocentric and Americentric bias within medical and non-medical spheres was already somewhat familiar to the students beforehand, but the scale of the issue was made even clearer to one of the authors when following, reading, and interviewing nurses from the global south or who worked in the countries of the global south. Many double standards and biases have come to light when doing research for this project, and when investigating further the theme of Western bias and its effect on the life and health of non-Western populations. Following this quagmire of biases and injustice patterns in healthcare research, more patterns that affect the health and safety of people

within Western populations have also been discovered by the students, making them more aware that the usual symptoms patients may present with may not always follow the guidebook due to the patient's gender. The limited knowledge about the variations in illness presentations, or illnesses at all, is due to the group in question having an extensive history of being silenced and dismissed. That is why more research is needed that takes into account gender and the different course of the disease in males and females.

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ATTACHMENTS

APPENDIX 1 Table of keywords and databases

Database	Keywords	Results	Accepted
ScienceDirect	“Community-acquired pneumonia” AND “Antibiotics” AND “Vaccine” Filters> English, 2015-2025	152	1
PubMed	“Community-acquired pneumonia” OR “Hospital- acquired pneumonia” AND “Lower respiratory tract infection” Filters> English, 2015-2025	84	2
Google Scholar	Prevention of community-acquired pneumonia in children Filters> English, 2015-2025	3200	1
PubMed	“Prevention” AND “Community-acquired pneumonia” AND “children” Filters> English, 2015-2025	289	1
ScienceDirect	“Acute Pneumonia and Complications” AND “Etiologic Agents” OR “Pathogens” AND “Treatment” Filters> English, 2015-2025	631	1
Google Scholar	Pneumonia in the African tropics Filters> English, 2015-2025	17600	1
Google Scholar	“Thalassemia overview” AND “pediatric” Filters > 2018 – 2024, English	9740	2
Google Scholar	“Thalassemia overview” AND “Kenya” Filters > 2018 – 2024, English	1020	2
ProQuest	“The Effectiveness of Posters” Filters> English, 2015-2025	1097	2
Google Scholar	How do I design a poster? Filters> English, 2018-2025	34400	1
SAMK Finna	Poster designs Filters> English, 2015-2025	59	1

APPENDIX 2: Table of literature search

Author of research, publication year, country	The purpose	Target group, participants, methodology	Results/ product of the project
Pates, K. M., Periselneris, J. N., & Brown, J. S. (2023), United Kingdom.	The purpose of this article is to provide a comprehensive overview of the causes, diagnosis, treatment, and prevention of pneumonia.	The article was written for healthcare professionals. They used publicly available data.	This article provided a comprehensive overview of the causes, diagnosis, treatment, and prevention of pneumonia.
Pahal, P., Rajasurya, V., & Sharma, S. (2025), United States of America (USA)	This study investigated methods to improve care coordination among multidisciplinary teams and identified the causes of community-acquired pneumonia to enhance patient outcomes.	The article was written for healthcare professionals. Data from various articles in the PubMed database were utilized.	An overview of the typical community-acquired pneumonia, its causes, symptoms, complications, and treatment.
Zar, H. J., Argent, A. C., Moore, D. P., Avenant, T., Green, R. J., Itzikowitz, G., Reubenson, G., Andronikou, S., Jeena, P., Nicol, M. P., Pillay, A., Masekela, R., Madhi, S. A., & Cohen, C., 2020, South Africa	To summarize effective preventive strategies to reduce the burden of childhood CAP	The target group is children and their caregivers. They use published evidence on pneumonia prevention and review guidelines and new publications focusing on prevention.	Recommendation for pneumonia prevention
Rider, A. C., & Frazee, B. W., 2018, America	The purpose of this article is to provide a comprehensive overview of epidemiology, pathophysiology, diagnosis, treatment, and prevention of pneumonia.	The article was written for healthcare professionals. Data from various articles was utilized.	This article provided an overview of CAP in adults.

Mani, C. S., 2018, US	The purpose of this article is to provide a comprehensive overview of acute pneumonia and its complications.	The article was written for healthcare professionals. Data from various articles was used.	This article provided an overview of CAP, bacterial and viral pneumonia, symptoms, and acute complications.
Lim, T. K., & Siow, W. T., 2018, Japan	The purpose was to investigate how tropical climates and climate change affect the incidence of pneumonia.	The article was made for healthcare professionals. Data from various articles was used.	From this article, we can see that pneumonia transmission is influenced by climate.
Wei Shen Lim, 2022, United Kingdom	The purpose of this article is to provide a comprehensive overview of the causes, diagnosis, and treatment of pneumonia.	The article was made for healthcare professionals. Data from various articles was used.	This article provided an overview of CAP and HAP, their diagnosis, treatment, and recovery from pneumonia.
Khaled M. Musallam, M. Domenica Cappellini, Thomas D. Coates, Kevin H.M. Kuo, Hanny Al-Samkari, Sujit Sheth, Vip Viprakasit, Ali T. Taher, 2024, United States	Summary of practical information to be used by clinicians practicing in world regions where thalassemia does not occur at a high frequency.	Physicians and healthcare professionals without earlier experience in treating thalassemia.	An overview of thalassemia as a disorder, its background, implications, and treatment.
Hamza Bajwa, Hajira Basit, 2023, United States	Outline of thalassemia's treatment plan and evaluation methods with an emphasis on the role of an interprofessional team in the management of thalassemia.	Healthcare professionals who meet and treat patients presenting with thalassemia.	Review of bedside evaluation techniques, etiology, and interprofessional strategies healthcare team should be aware of when working with thalassemia.

Barik, A. L., Purwaningtyas, R. A., & Astuti, D., 2019, Indonesia	This review aimed to identify the effectiveness of the use of traditional health promotion media (leaflets and posters) in a community setting in the digital era.	The search using a predetermined keyword chain in Scopus, Science Direct, and Sage Journals produced 208 publications; sixteen publications were accepted.	They identified that posters are still effective in our time.
Nino Hasanica, Ramic-Catak, A., Adnan Mujezinovic, Sead Begagic, Kenan Galijasevic, & Mirza O., 2020, Bosnia and Herzegovina	The article talks about the effectiveness of leaflets and posters in health promotion depending on the place of distribution and the targeted population.	This quantitative, applied study descriptively and analytically examined health-promoting content for practitioners. It surveyed 120 elementary school students from the Zenica-Doboj Canton.	The article researched the effectiveness of learning new knowledge by school students, depending on the poster format and placement, which reflected in reduced costs of health treatment.
Mutua, B., Sowayi, G., & Okoth, P., 2022, Kenya.	The article researched the correlation between malaria-prone areas and the occurrence of hemopathology, including thalassemia.	This study analyzed 247 selected cases from the hematology laboratory database at Aga Khan Hospital, Kisumu, from 2015 to 2020.	Correlation graphs about Lake Victoria's proximity and thalassemia, showing that thalassemia is beyond ethnicity, and is more related to malaria.
Kattamis, A., Forni, G. L., Yesim Aydinok, & Vip Viprakasit. 2020.	The article describes how different countries approached the prevention of thalassemia, what challenges were found, and what benefits it brought.	Literature review article written based on 83 research articles.	An extensive description of different strategies of prevention, costs of treatments vs. costs of prevention, what aspects prevent people from seeking screening, and how culturally sensitive the topic might be.

Pneumonia: a danger that cannot be ignored

Pneumonia is a lung infection caused by bacteria, viruses, or fungi.



When germs get into the lungs, they cause inflammation and fluid build-up there.

How does pneumonia spread?



When a sick person coughs or sneezes, germs are spread into the air and onto objects. You can become infected by breathing in them in or touching your face with dirty hands.

Why do some people get sick and others don't?

Germs entering the body do not always mean illness. Our defence system (immunity) destroys them.

But some things make us weaker in the face of illness:

- **An unhealthy lifestyle:** smoking, frequent alcohol consumption, and poor nutrition.
- **Age:** the bodies of children and the elderly do not fight as well.
- **Other illnesses:** asthma, heart disease, HIV/AIDS, malnutrition.



When the immune system is weak, the risk of developing pneumonia increases!

Treatment

Depending on the severity of the disease, treatment is carried out in a hospital or at home. The doctor will prescribe medication to fight the germs. For bacterial pneumonia, it is antibiotics. Antiviral and antifungal medications for viral and fungal infections, respectively. He may also give you medication to lower your temperature and reduce pain. In some severe cases, infusion therapy and oxygen therapy are also necessary.



Pneumonia can now be successfully treated!

It's crucial to start treatment on time. But many people die because they delay seeking medical attention.

Don't delay! At the first sign of symptoms, see your doctor.

**HOME
STREET
HOME**

Home Street Home
HS1 Center
HS1 Health Clinic
Makongeni village
Kisumu County
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Sustainable and
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These posters were done as a project thesis at SAMK
Student: Bohamaz Sofia

Symptoms of Pneumonia



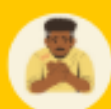
- Cough



- Fatigue



- Headache



- Lack of appetite

- Shortness of breath

- Fever

- Chest pain

Recommendations for people with these symptoms



Even if you have no appetite, you should eat



Drink more (clean water, juice, tea, or broth)



Get plenty of rest and if you have fever do cool compress



Don't forget to air out the room



Slowly increase mobility



Visit a doctor as soon as possible.



Not all people have the same symptoms. In elderly people, pneumonia may occur without typical symptoms. Pay attention to sudden fatigue, confusion, and lack of appetite.

Warning! The cough may be mild or absent altogether.

How to prevent pneumonia?



Wash your hands
Before touching food.
After coughing or sneezing. Do not touch your face with dirty hands.



Vaccination



Wear a mask
in high-risk areas
such as hospitals
during flu season.



Healthy diet and lifestyle



During the meeting with a sick person, you should use a mask and wash your hands afterward. Stay home if you feel unwell.

It is better to prevent disease than to treat it!!!

**HOME
STREET
HOME**


Home Street Home
HQ Center
HQ Health Clinic
Makongeni Village
Kwasa County
+25473871402
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samk
Gaskuun amnalkaahisa

These posters were done as a project thesis at SAMK
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APPENDIX 4: Thalassemia posters

Thalassemia



Thalassemia is a sickness that makes your blood weak so it can't carry enough oxygen around your body. **= Anemia**


Symptoms



Where does it come from?

- Thalassemia is a sickness you get from your parents.
- Sometimes the parents carry the sickness but are not sick themselves, so they pass it on without knowing.
- Thalassemia is common in regions that have malaria.
- Thalassemia is also one of the most common genetic disorders in the world.

DIZZINESS **NO ENERGY** **FAINTING**




WEAK BLOOD = WEAK BODY

Other symptoms:

In rare cases when thalassemia is very serious, it can lead to other problems:

- Short height because the body doesn't grow well
- Changes on the face:
 - The forehead that sticks out
 - The top jaw may push forward, making it hard to eat or talk
 - The cheekbones to get wider, making the teeth show more
 - Eyes may look puffy
 - A burning, swollen tongue.



These changes to the face are sometimes called "chipmunk face" to help remember what to look for.

samk HOME STRAIGHT HOME

These posters were done as project thesis at SAMK - Justyna Juszkiewicz

Types of Thalassemia

α ALPHA


MOST COMMON TYPE OF THALASSEMIA IN THE WORLD
IT HAS LESS SEVERE SYMPTOMS
 Many people find out they have alpha thalassemia whilst doing blood tests for other reasons.

BETA β

This type of thalassemia is less common, but it still does occur in Kenya.


SEVERITY OF ALPHA THALASSEMIA SYMPTOMS:

none




RARE!
VERY RARE!
HAPPENS TO UNBORN BABIES!


Carrier




Trait



Intermediate



Major



Treatment

- In thalassemia, it's the symptoms that are treated.
- You can take supplements to give your body what it needs to stay strong.
- You might want to seek genetic counselling if you want to know more or if you're trying to get pregnant with your partner.
- If you are already pregnant, stay in touch with medical staff.

- folic acid
- vitamin D
- vitamin E
- calcium
- zinc

!!! AVOID IRON !!!

Prevention

The only prevention method is to make sure you and your partner don't have the thalassemia gene. Consider genetic counselling and blood tests to check do you have thalassemia before trying for a baby.

+
=

HOME
STARTS
HOME