

# **IMPACTS OF CURRENT LIFESTYLE HABITS ON THE INCIDENCE OF NON-ALCOHOLIC FATTY LIVER DISEASE IN CHILDREN AND ADOLESCENTS**

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**Abstract:** With a broad etiological spectrum that encompasses metabolic, genetic, infectious, autoimmune, vascular, nutritional and idiopathic factors, non-alcoholic fatty liver disease (NAFLD) is the main cause of liver cirrhosis in children and adolescents. This condition is related to the increasing rates of childhood obesity that are intrinsically linked to current lifestyle habits. Therefore, the objective of this work is to understand how NAFLD, related to life habits, leads to the functional loss of the liver. This is an integrative review of the literature on life habits and childhood and youth NAFLD in which the findings indicate that NAFLD affects 3 to 12% of the pediatric population and 70 to 90% of obese young people. This pathology presents a multifactorial development, associated with intrauterine conditions, hereditary and ethnic factors, gestational conditions and absence of breastfeeding. However, it is central obesity, associated with a high-carbohydrate and high-fat diet and a sedentary lifestyle, that increases the risk of NAFLD. This happens because hepatocytes exposed to exacerbated accumulation of lipids culminate in hepatic steatosis. Thus, adipose tissue produces adipocytokines that cause oxidative stress and stellate cell activation, resulting in necrosis, inflammation, and cirrhosis. NAFLD can progress to the cirrhotic stage due to the absence of pathognomonic symptoms and late diagnosis, between 11 and 13 years. Finally, it was understood that current lifestyle habits related to poor diet and sedentary lifestyle culminate in lipid accumulation and, thus, lead to NAFLD, which can lead to cirrhosis.

**Keywords:** Obesity; life habits; cirrhosis; child; non-alcoholic fatty liver disease.

## INTRODUCTION

There is no doubt that the process of globalization, a phenomenon that marks global modernization, has allowed the

consolidation of social, economic and cultural interrelationships between the different countries of the world. This also ensured that nations could also share customs that fit the current modernization and the current acceleration imposed by the capitalist system. The exhausting work routines and the lack of time to take care of one's own body create a favorable environment for the prevalence of inappropriate lifestyle habits, such as eating based on instant foods, fast foods, frozen and long-preserved foods, in addition to decreased acceptance of sports and leisure activities.

In addition, poor diet can be easily explained by the power of manipulation over the children's public of media advertisements and promotional campaigns of fast foods that offer toys in the sale of their products that bring children closer to these foods. However, parents' eating habits have a significant impact on their children's food education. (SILVA, ENOHI, 2012)

In this context, it is undeniable that these world-wide customs reflect on the upbringing of children and directly influence their quality of life. This is because they are in continuous phases of development, whether bodily, biological, social and cultural. However, it is of paramount importance to emphasize that poor diet associated with the absence of physical activity, contribute to the consequences being harvested not only during childhood, but also during adulthood.

Thus, as a result of this cumulative process of damage to children's health, non-alcoholic fatty liver disease (NAFLD) stands out as one of the main liver diseases that has become prevalent in recent decades, especially due to the increase in childhood obesity. It is characterized by being a clinical spectrum resulting from the excess of fat present in the liver tissue, which over time can contribute to the dysfunction of this organ. (VITTORIO; LAVINE, 2020)

NAFLD is a possible manifestation resulting from the metabolic syndrome that comprises insulin resistance, visceral obesity, hypertension, dyslipidemia and abnormalities in fasting serum glucose levels (BERARDIS; SOKAL, 2013). However, the continuity of this pathological picture can follow, not only macrovesicular hepatocellular steatosis, but also non-alcoholic steatohepatitis (NASH), and, finally, liver cirrhosis. (VITTORIO; LAVINE, 2020)

Childhood liver cirrhosis, in turn, is a chronic and diffuse inflammatory process characterized by the remodeling of the liver parenchyma combined with the presence of fibrosis and regeneration nodules that lead to organ dysfunction and failure. It stands out for having a broad etiological spectrum that encompasses metabolic, genetic, infectious, autoimmune, vascular, toxic, nutritional and idiopathic factors. (ALFANI et al., 2018)

Thus, it is possible to conclude that liver cirrhosis is a consequence of a set of liver disorders formed primarily by NAFLD, which, due to the lifestyle of the globalized world and the current obesity pandemic, has significantly contributed to the high incidence of this condition. early, that is, still in childhood. (BERARDIS, SOKAL, 2013)

Therefore, in view of the silent configuration of these liver diseases and the knowledge that healthy lifestyle habits reduce the predisposition to manifest them, the discussion of this subject is undoubted. However, considering the existing difficulty in terms of adherence to such changes, it is necessary to seek incentive strategies that modify this scenario. Multiprofessional intervention programs must also be developed, which encourage the acquisition and maintenance of health behaviors by the entire population. The emotional and logistical support that these systems provide to young people is critical to motivational

engagement in physical activity.

Thus, it is expected that, in the next decade, NAFLD will be the main responsible for childhood hepatic impairment, followed by the need for liver transplantation in childhood and adolescence. (TEMPLE et al., 2016) This scenario is due to the childhood obesity pandemic that has increased in recent years, especially in Western countries. Studies indicate that it affects 3 to 12% of the general pediatric population and up to 70 to 90% of obese young people. (ALTERIO et al., 2014) In this context, regarding the prevalence of NAFLD in children and adolescents, it is necessary to emphasize that the studies are still inconclusive, given the lack of uniformity and consistency in the criteria and methodologies used for the diagnosis. (VITTORIO; LAVINE, 2020)

Another factor that contributes to the low validity of the data is the fact that the gold standard test for the diagnosis of NAFLD is the biopsy of liver tissue, an unfeasible method in population-based studies. However, even with the aforementioned limitations, studies carried out in the last decade indicate that black children may have some protection against fat accumulation. In addition, another finding indicates that the disease is predominant in male children and that it is accentuated during adolescence due to the influence of hormones on the metabolic conditions of this phase, which amplify this clinical picture, as a result of the increase in serum levels. of insulin and the accumulation of fat in the liver. (VITTORIO; LAVINE, 2020)

Finally, it must be noted that the absence of pathognomonic symptoms present in the framework of liver disorders, confers a late diagnosis, being identified mainly in the age group of 11 and 13 years. As mentioned above, NAFLD has a wide etiological spectrum that justify its high prevalence in the population,

being, therefore, the result of intrauterine life conditions, the care provided to the infant, genetic and hereditary, metabolic factors, poor diet and finally, from a sedentary lifestyle (ALFANI et al., 2018). Therefore, it is possible to conclude that the combination of two or more of these factors significantly contribute to a higher incidence of the pathology in children and adolescents. (BERARDIS, 2014) The chances increase when the pregnant woman develops gestational diabetes, gestational obesity, prepartum hyperglycemia. (VITTORIO; LAVINE, 2020)

However, the initial care provided to the newborn, such as early exposure to antibiotics and absence of breastfeeding, also contribute to increasing the child's predisposition to develop NAFLD. All this happens because when submitted to these conditions, the intestinal microbiome of the neonate becomes deficient, altering its ability to metabolize, especially short fatty acids, and its permeability allowing bacterial translocation. From this, the endotoxins released by these bacteria promote secondary inflammation in the liver, responsible for triggering a pro-inflammatory cascade that courses with hepatic steatosis and evolves with NAFLD. (VITTORIO; LAVINE, 2020)

Regarding genetic aspects, genetic polymorphisms of 3 proteins may be related to a greater propensity to develop NAFLD in childhood, namely: protein 3 containing patatin-like phospholipase domain (PNPLA3), member 2 of the 6 transmembrane superfamily and glucokinase regulatory protein (GCKR). Not only that, there is a potential hereditary influence on the pathology in question, confirmed by the study by Schwimmer et al, which showed a higher prevalence of NAFLD in children who had parents and siblings with the same disease, than in children with healthy parents and siblings. (VITTORIO; LAVINE, 2020)

Regarding the metabolic syndrome, it is evident that it has an intrinsic relationship with the occurrence of NAFLD in childhood, mainly because both share the same etiological spectrum associated with genetic, hereditary, intrauterine life and lifestyle factors. Therefore, NAFLD can be considered as a hepatic manifestation of the metabolic syndrome, even though studies have not yet concluded that one potentially contributes to the worsening of the other. (ALTERIO et al., 2014)

Nevertheless, the advent of electronics provided the supremacy of electronic games over physical activities, sports and even outdoor games. Thus, children tend to remain more reclusive at home, maintaining little contact with other children and the environment, which guarantees damage not only to social and cultural development, as well as to physical and motor development, and predisposes to central obesity, one of the main causes of obesity. main responsible for NAFLD. (SILVA, ENOHI, 2012) Scientific understanding enables the development of strategic actions in the medical, social and family scope, with the aim of mitigating the impacts caused by a sedentary lifestyle and irregular diet, catalysts of liver cirrhosis in children and adolescents.

Therefore, the main objective of this work is to understand the main cause of NAFLD related to current lifestyle habits that normally evolve to a cirrhotic condition, still in childhood. We seek to understand how NAFLD manifests itself and early diagnosis contributes to reducing the incidence of liver cirrhosis, as well as finding effective alternatives that encourage the modification of current lifestyle habits to healthy ones and listing preventive guidelines that must be inserted at the level of public health.

## MATERIAL AND METHODS

This is a narrative review, of a qualitative nature, in which the selection of articles is arbitrary. The virtual health and medicine libraries were accessed, respectively, Scielo-Scientific Electronic Library Online, and PubMed. In addition, there were data taken from credible treaties and web texts.

Works were chosen that answered the guiding question: “*How are current lifestyle habits intrinsically related to nonalcoholic fatty liver disease in children and adolescents?*”. In addition, full and free texts, meta-analysis, reviews, systematic reviews published from the 2000s onwards were valued in order to obtain more up-to-date works. Furthermore, the descriptors “Liver cirrhosis” and “Child” and “Adolescent” were used.

2469 text results were found using the descriptors. The filter of texts published from the 2000s onwards was applied, resulting in 1120 publications. 351 complete and free texts were found in full. Of these 351, only 30 fit into meta-analysis, review and systematic review. The 30 texts were read, and only 8 texts fit the question and guiding theme of the work. In addition, 4 works indexed on the Web and concepts taken from the Pediatrics Treaty were inserted.

Texts available only in the form of abstracts, published in sources that are not available electronically, such as articles, monographs, dissertations and theses, were excluded; duplicate studies, inconclusive or with little focus on the topic.

## RESULTS AND DISCUSSION

NAFLD is the most common etiology of chronic liver disease in children and adolescents, affecting almost 10% of the pediatric population, mainly in developed countries. In the last decade, it has become one of the main indications for liver transplantation in adults, requiring

both recognition and early treatment. (VITTORIO; LAVINE, 2020)

The clinical presentation of NAFLD, in initial scenarios, is asymptomatic and, when the condition worsens, it manifests itself through a nonspecific symptomatology. Among such symptomatological possibilities, the presence of abdominal pain due to structural alterations of the Glisson's capsule, fatigue, irritability, headache and difficulty concentrating stand out. (TEMPLE et al., 2021) Thus, due to the absence of a characteristic clinical picture, the diagnosis of NAFLD is usually late, incidental to physical examination and secondary to findings in blood tests.

Therefore, such nonspecific manifestation of this condition demonstrates the need to remain alert to children over 10 years of age, obese and with circumference greater than the 95th percentile. demonstrates the diagnosis of NAFLD prevailing between 12 and 13 years of age and indicates low rates of hepatic steatosis in children under 3 years of age. (TEMPLE et al., 2021)

The liver, like any organ, is made up of parenchyma and stroma, the former being responsible for functionality and the latter for supporting the entire functional framework. The parenchymal cells of the liver are the hepatocytes, which process and store nutrients, as well as metabolize and degrade hormones, drugs and toxins, (KLEINER; MAKHLOUF, 2015), therefore, they play important roles in the complication of fibrosis and cirrhosis, this is because are the main cellular constituents that are attacked by hepatotoxic agents. In addition, the liver also has a rich vascular network that assists in the execution of its physiological tasks, and it is important to highlight the presence of sinusoid capillaries that are made up of non-parenchymal cells, namely, hepatic sinusoidal endothelial cells, Kupffer cells and cells. starry. (ZHOU, ZHANG, QIAO, 2014)

Hepatocytes are the target cells of hepatitis viruses, alcohol metabolites, bile acids and fat, therefore, when they are injured as a result of one or more of these aggressive mechanisms, they release reactive oxygen species and fibrogenic mediators. In addition, through this aggression, the activation of stellate cells will also occur, such information is very relevant in the pathogenesis of liver cirrhosis because such cells are initially quiescent structures present in the sinusoidal capillary, where their main function is related to the storage of vitamin A. However, when the liver undergoes injurious processes that release platelet-derived growth factor, transforming growth factor (TGF)- $\beta$ , tumor necrosis factor (TNF)- $\alpha$  and interleukin-1, stellate cells are activated and initiate an exacerbated process of collagen production, initiating the process of hepatic fibrosis. (ZHOU, ZHANG, QIAO, 2014)

Thus, when exposed to pathological conditions, associated or not with excessive alcohol consumption, hepatocytes can accumulate large amounts of lipids, resulting in hepatic steatosis. This may precede or be associated with fibrosis. (KLEINER; MAKHLOUF, 2015) In this sense, NAFLD is a condition of steatosis in the liver, caused and influenced, as already mentioned, by obesity. Adipose tissue produces adipocytokines that culminate in tissue oxidative stress and stellate cell activation, resulting in necrosis, inflammation, fibrosis and, ultimately, cirrhosis. (BERARDIS; SOKAL, 2013)

Therefore, the diagnostic investigation for NAFLD must first go through the verification that the child or adolescent does not consume alcohol, in order to consider the diagnostic hypothesis of the disease under discussion. Subsequently, it is necessary to start from the identification of prenatal history, gestational data of the mother, laboratory and imaging tests. (VITTORIO; LAVINE, 2020) In

addition, if pediatric patients have central obesity, dyslipidemia and insulin resistance, there is a great predisposition to develop NAFLD. This causal relationship between metabolic syndrome and NAFLD was found in a study carried out with 43 American children, which proved that 40 of them were obese and had insulin resistance. (SILVA, ENOHI, 2012). In the clinic, it is important to pay attention to the physical examination, which can demonstrate, during palpation and inspection, respectively, hepatomegaly in up to 50% of cases and acanthosis nigricans, in 33%-55% of cases confirmed by biopsy, in the posterior part of the neck, in intertriginous areas or joints. (TEMPLE et al., 2021)

Diagnostic measures, including ultrasound-based imaging and analysis of serum aminotransamine values, are crucial for such management. (VITTORIO; LAVINE, 2020). However, normal aminotransferase levels are no guarantee that disease is significantly absent. In addition, some patients with metabolic syndrome who have features of NAFLD, including fibrosis and cirrhosis, will have aminotransferases within the normal range, so these patients may not be diagnosed on serologic screening. (KLEINER; MAKHLOUF, 2015)

In laboratory tests, the pathology can be characterized by atherogenic dyslipidemia with dysfunctional circulating very low-intensity and high-density lipoproteins. A glutamic oxalacetic transaminases, TGO/TGP  $> 0.8$ , can be suspected of more advanced stages with fibrosis. Gamma glutamyl transpeptidase (GGT) may be elevated, as well as inflammatory cytokines (TNF-alpha and IL-6). In addition, it is essential to request evidence of oral glucose tolerance, fasting glucose, HbA1C, blood count and triglycerides. (KLEINER; MAKHLOUF, 2015)

Steatosis can be detected by imaging, using ultrasound (USG), computed tomography

(CT), or magnetic resonance imaging (MRI). USG is the most indicated because of its cost-effectiveness ratio, however it is necessary that there is an important infiltration of adipose tissue in order to detect the imaging signs of steatosis, with low sensitivity when less than 30% of the hepatocytes are steatosis. Sensitivity becomes relevant when hepatocytes are above 33% infiltrated, however some studies indicate that US is sensitive to an amount of steatosis as low as 10%, especially when implemented with standardized measurements and quantitative scores. (TAVARES, et al., 2019)

The exam has limitations, such as the inability to differentiate steatosis from fibrosis, problems with morbidly obese and their dependence on operator and machinery. Regarding the advantages, it has its low cost, availability and the general scan of the abdominal organs. Non-contrast CT is accurate for diagnosing grade 2 and 3 steatosis, but not for grade 1 steatosis. Its sensitivity and specificity, as with US, depends on the fat content, with a sensitivity of 82% and specificity of 100% when the Fat infiltrate reaches more than 30% of hepatocytes. (TAVARES, et al., 2019)

MRI is the most sensitive imaging test to detect increased intrahepatic fat. This can detect the increase in fat by 3%, however its disadvantage is the high cost and low availability that limit its use. There is currently a more sophisticated test, called Fibroscan, which can be used to detect steatosis, since it is more sensitive to identify lower degrees of fat in the liver compared to other imaging methods and has the advantage of simultaneously estimating liver fibrosis. (TAVARES, et al., 2019)

The disadvantage of Fibroscan is that the underlying disease, BMI and type 2 diabetes mellitus can affect the results and must be taken into account when interpreting them. Liver biopsy is the gold standard for diagnosis,

it is the only tool that can distinguish steatosis and steatohepatitis, in order to classify not only the severity of liver disease, but also to designate cases with more than one diagnosis. For this, this is done by a histopathological analysis, so that the distribution of steatosis within the hepatic acid is more intense around the central veins, especially in zones 2 and 3, and the periportal areas are preserved at the beginning of the disease. (KLEINER; MAKHLOUF, 2015)

In steatohepatitis, which has inflammatory characteristics, its changes are nonspecific and variable, but are often mild compared to chronic hepatitis. Steatosis with inflammation are more likely to progress to advanced fibrosis and cirrhosis. Therefore, as the amount of fibrosis increases in steatohepatitis, more inflammation is seen in the portal areas or within the fibrous bands, so patients who are approaching cirrhosis will have more inflammation in their fibrous tracts than patients who are in the disease onset. (KLEINER; MAKHLOUF, 2015)

In this sense, during the interpretation of liver biopsies from pediatric patients, the characteristic criteria of NAFLD for this population must be considered, in order to avoid confusing it with other fat-storing liver diseases. Pathologists need to recognize the most frequent pattern found in children and adolescents when interpreting biopsies. (BRAZILIAN SOCIETY OF HEPATOLOGY)

It is worth noting that the high prevalence of the disease makes it impracticable to perform biopsies in all patients, especially pediatric ones, so that non-invasive methods must be preferred. Therefore, this procedure must be indicated in situations where the patient is suspected of having steatohepatitis and in the differential diagnosis with other chronic liver diseases. In addition, if the child or adolescent indicates a high risk of steatohepatitis or advanced fibrosis suggested by serological

markers, elevated liver enzymes (ALT/AST) for three months, metabolic syndrome carriers not controlled with behavioral measures after six months, liver biopsy is also suggested. (BRAZILIAN SOCIETY OF HEPATOLOGY, 2015)

There are also situations where liver biopsy is not indicated, such as for patients with asymptomatic hepatic steatosis that has been detected by imaging and has normal liver enzymes. Liver biopsy, despite being considered the gold standard, has its disadvantages due to its invasiveness, cost and sampling variability limit viability, as well as being prone to sample errors with considerable intra and interobserver diversity in the interpretation of histology. (BRAZILIAN SOCIETY OF HEPATOLOGY, 2015)

Thus, the diagnostic investigation must be carried out properly, taking all aspects into account to guide the best clinical reasoning, such as laboratory aspects, imaging and histopathological exams, considering that it is a silent disease with unspecific symptoms. Considering the multifactorial and systemic aspect of NAFLD and its possibility of progressing to cirrhotic conditions, it is extremely important to implement the following triad: early diagnosis, effective therapeutic interventions and changes in lifestyle. Therefore, all these measures are intended to identify and reverse the clinical condition of children and adolescents with liver disease, as well as to promote quality of life and favorable conditions for the psychomotor development of these patients.

Nevertheless, the convergence of genetic and environmental factors that directly or indirectly influence the clinical picture of these children and adolescents must still be taken into account, and therefore, it is essential that the medical care provided is adapted to the circumstances and needs of the patients in

question. (TEMPLE et al., 2021) In addition, it is necessary to emphasize that, as it is a pediatric population, some difficulties will be encountered mainly with regard to acceptance and adaptation to clinical treatment, thus requiring follow-up by a multidisciplinary team and creation of strategic measures to solve this problem.

In this bias, it is undoubted that the first line of defense for the treatment of NAFLD and for the prevention of childhood liver cirrhosis is the change in lifestyle that influenced its occurrence. In view of this, a diet based on foods with low carbohydrate and fat content, concomitant with the practice of physical activities, is recommended. Such measures have as their main objective the reduction of central obesity, as well as the intrahepatic fat content, thus promoting an improvement in the clinical condition of these patients. (VITTORIO; LAVINE, 2020) Encouraging changes in dietary patterns in childhood has repercussions and is maintained during adulthood, which helps to prevent such liver disorders in the future. (TEMPLE et al., 2021)

The diet must be directed at avoiding drinks and foods high in sugar or fructose, as well as saturated/trans fats, increasing the intake of polyunsaturated fats, especially omega-3 fatty acids. Foods with high calorie rates, such as “fast food” and industrialized foods, and the habit of eating quickly must be avoided, since fast eating is almost always accompanied by compulsive food intake, neutralizing efforts to eat. weight loss. In addition, it is indicated to increase the intake of non-soluble fibers derived from cereals. (BRAZILIAN SOCIETY OF HEPATOLOGY)

Thus, treatment in pediatric patients also involves, mainly, weight loss (-10%) and for that, some changes must be implemented in the children's life habits, but in a flexible way, in order to avoid the rigidity that it



causes, after some time, in abandonment of the new practices. Regular physical activity improves well-being and insulin response and is important for weight loss, so it is suggested that the patient do physical exercises that induce an increase in heart rate for 30 to 40 minutes a day, four to five times a week. It is important that for refractories, some level of physical activity is undoubtedly better than none. (BRAZILIAN SOCIETY OF HEPATOLOGY)

For those who reject physical exercises or who tend to be sedentary, it is convenient that they can vary the duration, the days of the week, the places and the types of activities, transforming them into something pleasurable rather than feeling obliged to practice rigidly. for predetermined time, times and days. (BRAZILIAN SOCIETY OF HEPATOLOGY)

However, it is necessary to mention that such intervention proposals may be little accepted by patients and their families when they do not match their economic and sociocultural conditions. Thus, it is essential that the medical team is attentive to the Social Determinants of Health that influence the treatment of each child and adolescent, adapting it to their reality. Another existing barrier stems from the silent symptomatic character of this liver disease, which masks the real clinical picture. In view of this, the patient does not feel motivated to change his habits because he is not aware of his true condition. (VITTORIO; LAVINE, 2020)

It is not an easy task due to the great coercivity that current habits exert on behaviors. The easy access to the microcomputer, the development of more interactive and thought-provoking video games, the attractions made available by television channels and the internet, and the excessive use of mobile devices such as smartphones, in addition to the vulnerability

of children in relation to appealing advertisements portrayed daily by the media of food.

To set up a physical activity program, it must be based on three criteria, aerobic, muscle strength and flexibility, varying the emphasis on each according to the clinical condition and goals of each child. When the objective is aerobic conditioning, the prescription must contemplate the variables type, duration, intensity and weekly frequency, obeying the general principles of training. Muscle training must be performed with moderate loads and a greater number of repetitions, valuing the motor gesture, since this type of activity contributes to the increase of muscle strength and bone mass. (SILVA; JR, 2011)

The risk of osteoarticular injuries in children who perform muscle overload work is actually lower than that related to contact sports, as long as it is performed with submaximal loads under adequate professional supervision. Regarding flexibility, training must involve the main joint movements and be performed slowly to the point of slight discomfort and then maintained for about 10 to 20 seconds. (SILVA; JR, 2011)

In addition, friends and family seem to play an important role in encouraging children and adolescents to practice physical activity. This support is due to social integration or company, which corresponds to the moments when they practice physical activity together. However, demands related to the parents' work and lack of time prevent their involvement in leisure activities. (DIAS, 2016)

On the other hand, pharmacological intervention aims to either delay or reverse the progression of liver damage, as well as to act systemically on metabolic aspects, aiming to reduce obesity, insulin resistance and dyslipidemia. In this sense, drugs that increase insulin sensitivity act

by preventing lipogenesis in the liver and consequently decreasing steatosis. Vitamin D supplementation significantly contributes to the reduction of visceral adiposity, fibrosis and necroinflammation by regulating genes that act on glucose and lipid metabolism. Finally, it is still necessary to mention the benefits of vitamin E, especially regarding the reduction of steatosis, inflammation and ballooning in hepatocytes, being therefore an important pharmacological agent for NAFLD. (TEMPLE et al., 2021)

Regarding the guidelines for prevention measures, good nutrition is a fundamental activity for human survival in its various aspects, including biological, social and psychological. This is a practice influenced by culture and constantly modified. It is in childhood that eating habits are initiated and this is defined by the types of food choice and consumption, in response to influences from the social and family environment. Thus, according to the experience lived by the individual, it determines such habits. (SILVA; ENOHI, 2019)

It is for this reason that parents play a fundamental role in the conception and maintenance of their children's health, as they are the examples acquired by children, which they will accompany from childhood to adulthood. Adequate nutritional intake is necessary for the execution of biological functions and its deficiency or excess can cause functional changes. (SILVA; ENOHI, 2019)

In this sense, the nutritional transition, caused by the insertion of new eating habits by globalization, changed the food experience of children and adolescents, causing consequences for the health and disease process, impacting their development and growth. (DIAS, 2016) Media focused on children leaves children vulnerable to the media appeals of advertisements for foods

rich in sodium and lipids, and low in fiber, making most of the time even their own parents are influenced and contribute for poor nutrition. (SILVA; ENOHI, 2019)

## CONCLUSION

Therefore, it is evident that NAFLD is intrinsically related to cultural, social and family aspects, thus being a public health issue. Despite having a wide etiological spectrum that ranges from intrauterine, genetic and hereditary factors, it is the bad habits of life that catalyze the illness of children and adolescents and predispose them to the complications of this disease, which can result in liver cirrhosis.

Regarding the pathophysiology of the evolution of chronic liver diseases, there is the possibility of reversibility of the clinical condition when there is early diagnosis and effective intervention, therefore, the clinical, laboratory and imaging diagnostic approach mentioned above is extremely important to reduce the incidence of NAFLD in the pediatric patient group.

In addition, due to the modernizations brought about by globalization and the influence they have on children's taste, consumption of foods with a high percentage of sodium, lipids and a small percentage of nutrients and vitamins has increased considerably. Associated with this, the approximation of children to screens and electronics distanced them from sports and leisure activities. Thus, poor diet and sedentary lifestyle, now very frequent, play a leading role in the occurrence of NAFLD, given that their consequences are directly related to the maintenance of liver function.

To prevent NAFLD in children and adolescents, as well as reduce the prevalence of obesity, changing lifestyle habits in relation to increasing the inclusion of physical activity in daily life and better nutrition are essential.

Therefore, physical exercise and a healthy diet need to be understood and seen by pediatric patients as something pleasurable, fun, and essential for life.

And to encourage the practice of physical exercise, it is necessary to clarify to children and adolescents that it has a broader meaning, regarding the benefits related to health, in the short and long term, assuming direct responsibility for the development of their own health behaviors. Physical activity in this age group means not only contributing to improve the lipid and metabolic profile in order to reduce and prevent obesity, but also means establishing a solid basis for reducing sedentary lifestyle in adulthood.

Therefore, in order to delimit prevention strategies at the public health level, it is necessary that parents are the main ones influenced by a healthy diet. The construction of conversation circles to carry out educational measures, generate sharing, exchange of experiences, give lectures is a great way to value eating habits and raise the awareness of those responsible and caregivers about the importance of food.

It is also important to create teaching policies aimed at guidance from the early stages of teaching. This way, the child would have in their repertoire of knowledge, the notion that there are essential foods for the proper functioning of the body and that a good diet combined with the frequent practice of physical activities favor a better quality of life than that experienced by the current population.

Public food programs such as the PNAE (National School Food Program) can help to conceptualize the idea of healthy eating in the school environment, however, it is necessary that there is monitoring of the program's goals and consistency with the local culture.

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