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The Impact of Infectious Diseases on the Morbidity and Mortality of Children Under 5 Years of Age in Health Center 8 of Tulcán, Ecuador

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Article History	Abstract
	***Aim**: Approximately 96 out of every 1000 children born die worldwide, due to infectious diseases of gastrointestinal and respiratory origin. In Ecuador, 23.2% of all infant deaths in 2018, were due to infectious diseases. **Material and method**: In the present study, a descriptive research approach was adopted with the objective of examining the specific characteristics of the study population, made up of 20 families with children under 5 years of age who attended the Tulcán Health Center 8 due to infectious diseases. The importance of this study lies in its contribution to scientific knowledge about the situation of infectious diseases in children under 5 years of age in Tulcan Health Center 8. **Statistics and Result:** It seeks to guide health policies and programs aimed at prevention, early detection and adequate treatment of these diseases.*

1. Introduction

Infections are the most frequent causes of morbidity, caused by an infectious agent, refers to the presentation of a disease or symptom of a disease, or to the proportion of disease in a population. It can cause high mortality in the world, particularly in developing countries.

Infectious diseases accompany the child habitually and inevitably during most of his childhood due to the immaturity of his immune system, which is more sensitive to infectious agents, and also because of his unhygienic habits, such as sharing pacifiers or toys that have previously been put in the mouth and that facilitate the spread of these infections more quickly, In developing countries also early weaning in many children, since their mother has to go to work early, to get economic resources for the maintenance of her family (Calle , 2018; Edu, 2023; Mengana et al., 2020).

Gastrointestinal and respiratory diseases are one of the leading causes of child morbidity and mortality worldwide. Approximately 96 out of every 1,000 children die each year from gastrointestinal and respiratory diseases.

In Ecuador, infectious diseases in 2018 comprised 23.2% of all child deaths; among them the most prevalent are: Respiratory infections waters (ARI), gastrointestinal infections of infectious origin were among the first cause of child morbidity with a rate of 198.1 per 10,000 inhabitants under 1 year, and is the first cause of general morbidity among children.

Although mortality from this disease has decreased substantially during the last two decades due to the widespread use of airway humidification therapy and greater care by parents or caregivers; and also by immunization process, so morbidity continues to affect populations especially those in

developing as is our country, thus in Latin America, children suffer four to five episodes of infectious diseases per year. Repetitive episodes of gastrointestinal and respiratory diseases are closely related to chronic malnutrition in children, making them vulnerable to other diseases (Analyst, 2020; Rosique, 2010). Gastroenteritis, respiratory diseases, is associated with environmental factors in 94%, such as consumption of non-potable water, sanitation and insufficient hygiene. Therefore, it is of vital importance the prevention of diarrheal disease, respiratory considering these aspects, which in synthesis include access to a healthy environment, with equitable investment both economic and social.

Given the great influence of gastrointestinal and respiratory diseases on the health of children and the population in general, there is a need to prevent infectious diseases, considering health as a right. Within prevention, knowledge and control of risk factors are important; Thus, hygiene practices have shown great potential to avoid 11% of occasions (Noboa, 2023; Santos, 2018). For moments linked to risk with food, these children wash in 17% of cases and with soap 5% of the time. In Ecuador the situation is similar, emerging the need to promote hand washing, especially in vulnerable populations such as children.

Rotavirus is the most common cause of severe dehydrating diarrhoea in infants and children worldwide. The frequency has decreased since the introduction of rotavirus vaccines. It usually affects infants and toddlers 3 to 15 months of age. Rotaviruses are highly contagious. Most infections are spread by fecal oral transmission. Infected infants can transmit the infection to adults (Noboa, 2023; Santos, 2018). In temperate climates, rotavirus infections are more frequent in the winter months and less frequent in summer. In tropical climates, they can occur throughout the year.

Respiratory tract infections are a group of diseases that occur in the respiratory tract and are caused by various microorganisms such as viruses and bacteria. In children under 5 years of age, 95% of infections are viral and have a good prognosis, but a small percentage may develop complications such as otitis media, sinusitis and pneumonia.

Nowadays, despite scientific advances we can observe that the population under study is exposed to infectious diseases and many of them die this is because many factors that influence can be due to economic, social situations. Many of the times people do not become aware and let this affect children to a point where they can die. In the case of children under 5 years of age, it was determined that the most common diseases at this age are respiratory and diarrheal. The first, produced by viruses, bacteria and parasites, the same ones that spread through the respiratory route: influenza, bronchitis, pharyngitis, otitis, sinusitis, pneumonia (Cordova, 2020; Sanitas, 2018). The second are produced by viruses, bacteria and parasites, their symptoms mainly are: vomiting, diarrhea, dehydration that almost always especially in chronic cases leads to malnutrition, with all the sequelae that this disease presents.

According to data provided by the Health Directorate of Carchi and medical care centers, in the province there are approximately 61 public and private health units, with the presence of 103 general practitioners and 54 dental and specialists. The provincial infant mortality rate in the urban sector is 30.9% and in the rural sector it is 45.5%. Chronic malnutrition in children under 5 years of age is 57.5%. The overall mortality rate is the proportion of people who die to the total population. A mortality rate is considered to be high when it exceeds 30 per cent, moderate if it ranges from 15 to 30 per cent; and low if it is less than 15%.

In the Health Center 8 of the city of Tulcán – Ecuador, of the total care in children under 5 years, 20% are diagnosed with acute diarrheal diseases while 35% are diagnosed with respiratory infections. Therefore, it will be very important to develop this research, which allows us to have updated information on this health problem and know how to try to control these diseases (Luna et al., 2020; Villamarin, 2020).

2. Materials And Methods

The research design is descriptive. Descriptive research is responsible for pointing out the characteristics of the population being studied. Descriptive surveys reflect or document present

attitudes or conditions. This means that it tries to find out what situation a certain population is in at the time the research is carried out.

Methodologically it is mixed, the quantitative and qualitative approach of mixed research is characterized by privileging empirical-deductive logic, from rigorous procedures, and the use of statistical data collection techniques. The study population is made up of 20 families that have children under 5 years of age who come to the health center 8 for infectious diseases in the city of Tulcán. For this project, a convenience sampling method has been used, which is a type of non-probability sampling in which children who attended the second week of August (8/8/2022 – 8/12/2022) to health center 8 in the city of Tulcán for infectious diseases were taken into account.

The technique used is the survey with its respective questions, for which a questionnaire was elaborated with questions that were applied to the parents of the 20 children who attended the health facility in the city of Tulcán. The tool used for the survey is the previously validated questionnaire, this allowed the structuring of the questions and later applied to the parents of the children who come to the Health Center. This questionnaire contains structured closed-ended multiple-choice questions.

The data obtained from the surveys individually were grouped and tabulated using the Microsoft Excel program, and then graphed using the different statistical graphs.

3. Results and Discussion

A The obtained metrics was compiled on a MS Office Excel Sheet (v 2019, Microsoft Redmond Campus, Redmond, Washington, United States). Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 26.0, IBM). All the measured parameters data was then subjected to discriminative statistical analysis and analysed using unpaired t-test. Statistical analysis was done by calculating the mean and standard deviation of all above mentioned parameters.

Interpretation of the results of the survey addressed to parents of children who come with infectious diseases to health center No. 8 in the city of Tulcán-Tulcán.

Question 1. Sex of the child

Analysis and interpretation:

From the parents surveyed, it was obtained that of the 20 children who came for care for infectious diseases, 10 (50%) children were male and 10 (50%) were female.

Question 2. Child's age

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Edad de los niños/a que acuden al establecimiento de salud

- 0-1 años
- 2-4 años
- 4-5 años

Analysis and interpretation:

Of the children who attended the health facility, 9 children (45%) were aged 0-1 years, 6 children (30%) children aged 2-4 years and finally, 5 children (25%) aged 4-5 years, which results in the health center more children aged 0-1 years for acute infectious diseases.
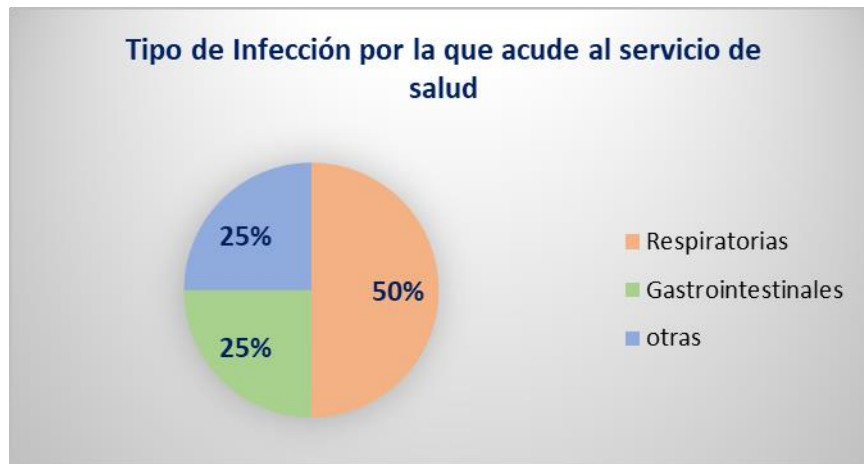
Question 3. Type of feeding the child received up to 6 months

Tipo de alimentación que recibió al niño/a hasta los 6 meses de edad

- Lactancia materna
- Lactancia artificial
- Mixta

Analysis and interpretation:

The survey showed that 13 children (65%) of the people surveyed indicated that their children under 6 months of age received exclusive breastfeeding, 6 children (30%) indicated that their children receive mixed feeding, i.e. with artificial breastfeeding (milk formulas) and breastfeeding and one child (5%) received only artificial breastfeeding (milk formula), The survey showed that the children who most attended this health center were fed exclusive breast milk until the age of 6 months.

Question 4. Has the child become ill from any type of infection? And if so, what kind of infectious disease do you go to the health facility?

Tipo de Infección por la que acude al servicio de salud

- Respiratorias 50%
- Gastrointestinales 25%
- otras 25%

Analysis and interpretation:

Of the total of the children surveyed, 10 of them (50%) answered that the children who came to the operating unit were because they presented a clinical picture compatible with infectious respiratory diseases, 5 children (25%) indicated that the children came to the health unit for presenting gastrointestinal diseases and finally 5 children (25%) suffer from other infectious diseases such as urinary tract infection. of the skin and immunopreventable, etc., the children who went to the health center No. 8 Tulcán were for suffering from respiratory diseases and of them of the upper respiratory type.

Question 5. What preventive behaviors do you take to avoid AKI?

Qué conductas preventivas toma Ud. para evitar las IRAs

- Vacunación, evitar cambios bruscos de temperatura, ventilar los ambientes evitar el humo de tabaco — 85%
- Lavarse las manos después de ir al baño, no entrar a baños públicos con los cordones desatados, no estar en contacto con personas con diarrea — 15%

Analysis and interpretation:

The survey reflected that 17 parents (85%) responded that the measures that should be taken to avoid infectious diseases are vaccination, avoid sudden changes in temperature, ventilate environments, avoid tobacco smoke and 3 parents (15%), indicated that the measures to avoid infectious diseases are: wash your hands after going to the bathroom, Do not enter public toilets with the cords untied, do not be in contact with people with diarrhea.

Question 6. In case your child has a cough, sore throat, ear, or fever. What's the first thing you do?
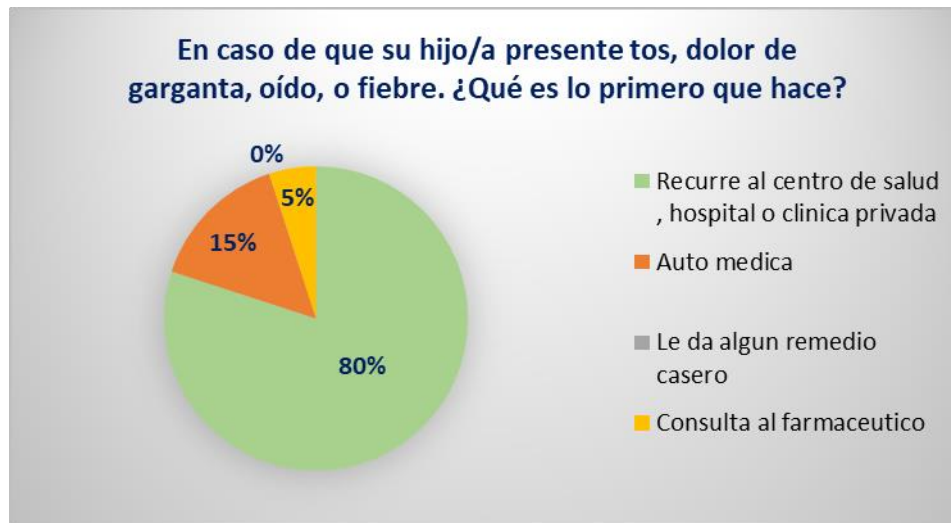
Analysis and interpretation:

The survey showed that 16 parents (80%) answered that when children suffer from infectious diseases they go to the health center, hospital or private clinic, in the same way 3 parents (15%) indicated that they self-medicate their child and a father (5%) indicated that he consults the pharmacist and with 0% indicates that they give them home remedies. Parents have an affinity for taking their children to a health unit when they suspect an infectious disease.

Question 7. What are the symptoms of a respiratory infection?

Analysis and interpretation:

The research showed that 7 parents (35%) knew us that the most common symptoms of children is whitish fecal matter, dark urine and yellowish conjunctiva, and similarly 6 parents (30%) that indicates that the symptoms are urine frequently and with burning and fever, and then we have that 4 parents (20%) that indicates the symptoms are fever, cough, mucus, sore throat and ear and finally we have 3 parents (15%) with symptoms are diarrhea, vomiting and abdominal pain. These results let us know that only 20% know what the symptoms of a respiratory tract infection are, while there is a high percentage of parents who do not know the symptoms and signs caused by a respiratory tract infection.

In the network of the Ministry of Public Health, Health Center No. 8, is considered within the first level of care, which is the gateway to the health system, and which helps for the diagnosis of diseases and their symptoms in the initial stage, and that in many cases its treatment is outpatient.

According to the WHO, Acute Respiratory Infections (ARIs) is one of the leading causes of morbidity and mortality in the world, ranking among the top ten causes of death in the general population and within the top three in children under five years of age. It is estimated an average of 4,000,000 deaths in the world per year from this disease, so it is considered a public health problem (Bastidas, 2020; Ricardo, 2020). The population group most at risk of dying from AKI are children under 5 years of age.

In our study it was found that of the 20 children who came to consultation for presenting an infection, 10 children (50%), consulted for presenting a clinical picture compatible with a respiratory tract infection, this information shows that the first cause of morbidity in children under 5 years is due to AKI, agreeing with what the WHO refers.

The WHO indicates that Latin America managed to reduce infant mortality (MDG 4) by 67%, from 53.8 to 17.9 per 1,000 live births between 1990 and 2015. Diarrhoea and pneumonia remain important causes of death; These two diseases caused 14% of all deaths in children in 2015. Of all under-5 deaths, diarrhoea causes 10% in Haiti, 8% in Nicaragua, 7% in Guatemala and 6% in Bolivia. In these

countries the use of oral rehydration salts is low (about 50%). The proportion of pneumonia as a cause of under-5 mortality is 23% in Haiti, 17% in Guatemala, 16% in Nicaragua and 14% in Bolivia.

Although there is also a decrease in diarrheal diseases worldwide, it is also important to know that in our study the second cause of morbidity consultation was due to gastrointestinal infections after ARIs, in accordance with the information referred to by the WHO on infectious pathologies in children under 5 years of age.

In his research on infectious diseases, he states that it is a health problem in Algeria that continues to cause sick and deceased children; also, acute diarrhoeal diseases and acute respiratory infections are the main causes of hospital care in the province of Ballad (Santos, 2018; Bastidas, 2020; Ricardo, 2020), caused by early weaning and malnutrition, factors that contribute to high incidence of morbidity and low mortality, so special attention should be paid to patients under 5 years of age, including those under one year of age, who are the most frequently ill.

This information is also consistent with the evidence of the research conducted by us, that infections in children under 5 years of age are an important cause of morbidity at this age, as a risk factor early weaning, since in our research of the 20 children surveyed only 13 of them (65%) were exclusively breastfed until 6 months, while 6 children (30%), their diet was mixed, that is, milk formulas and breast milk and one child was fed exclusively with milk formula.

4. Conclusion

Thanks to the research, it was possible to theoretically substantiate the role of infectious diseases within infant morbidity and mortality in children under 5 years of age, in the Health Center 8 of Tulcán in the period 2022. It was possible to design the methodological framework to be used for the development of research, its techniques and instruments according to obtain the results proposed for the correct development of research. It was possible to structure a plan for prevention and timely detection of infectious diseases that affect infant morbidity and mortality in children under 5 years of age, in the Health Center 8 of Tulcán in the period 2022. In our study it was evidenced that the first cause of consultation in children under 5 years of age in health center No. 8 was for Acute Respiratory Infections (50%), followed by Diarrheal Infections (25%) and the rest for other types of infections such as skin diseases, urinary tract infection and immunopreventable. It will be necessary to carry out another type of research with a more significant sample, which allows to confirm the results of this research and results of other investigations that indicate the relationship between infectious diseases and morbidity and mortality in children under 5 years of age. It is important to analyze the low knowledge about respiratory tract infection, only 4 parents (20%), know their symptoms, knowing that this pathology is the first cause of morbidity consultation in children under 5 years in our health unit.

References:

Analyst. (2020). Acute respiratory infection in children - Fundación Valle del Lili. https://doi.org/10.1186/s13054-020-2756-3

Bastidas NPE, Cabrita CMM, Flores DFC, Castillo MRD. (2020). Legal pluralism as an alternative system of law. A proposal from the critical paradigm. University and Society, 12(S(1)), 39–46.

Calle Orellana PL, Cepeda Balla RC. (2018). Evaluation and modification of the knowledge, attitudes, and practices of handwashing in the children of the Ramón Ulloa School, Victoria del Portete parish, Cuenca 2008-2009. Read More

Córdova Sotomayor DA, Chávez Bacilio CG, Bermejo Vargas EW, Jara Ccorahua XN, Santa Maria Carlos FB, et al. (2020). Prevalence of acute respiratory infections in children under 5 years of age in a maternal and child center in Lima. Horizonte Médico, 20(1), 54–60.

Health in the Americas, 1998 Edition, v.1. (1998). https://doi.org/10.1016/S0002-9149(97)00937-5

Luna LAL, Lastra ORE, Bunay AP, Cortez LEÁ. (2020). Impact of economic investment on the nationalities of Pastaza and poverty levels. University and Society, 12(S(1)), 24–30.

Mengana López E, Azahares Arguello H, Pérez Reyna E, Casanova Delgado AL. (2020). Clinicoepidemiological characterization of Algerian children with infectious diseases. Medisan, 24(6), 1049–1064.

Noboa H. (2023). Mortality C. unsolved tragedy. https://doi.org/10.3390/safety9020034

Ricardo JE, Flores DFC, Diaz JAE, Teruel KP. An exploration of wisdom of crowds using Neutrosophic Cognitive Maps. Infinite Study, 2020.

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Ricardo JE, Hernández NB, Zumba GR, Márquez MCV, Balla BWO. The ASSESSMENT CENTER FOR THE EVALUATION OF THE COMPETENCES ACQUIRED BY HIGHER LEVEL STUDENTS. Oper Research, 40(5).

Rosique G, Mercedes R. (2010). Risk factors for morbidity and mortality from acute respiratory infections in children under 5 years of age. Revista Médica Electrónica, 32(3).

Sanitas RM, Carolina D, Henao V, María E, Gomez P, Carrillo MH, et al. (2018). Read More https://doi.org/10.1007/s00108-004-1224-5

Santos Preciado JI. (2018). The CISEI: reference in research on infectious diseases in the XXI century. Salud Pública de México, 60(1), 1–2. https://doi.org/10.21149/9234

Vazquez MYL, Ricardo JE, Vega-Falcon V. (2022). Artificial intelligence and its application in the teaching of Law. Estudios Desarrollo Soc Cuba Am Lat, 10, 368–380.

Villamarín SMG, Moncayo JCN, Borbor AMC. (2020). Legal certainty and the paradigms of the constitutional state of rights. University and Society, 12(S(1)), 346–355.