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ORIGINAL

"Tooth fairy" educational strategy for infants in the fifth year of life

Estrategia educativa "el hada de los dientes" para infantes de quinto año de vida

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ABSTRACT

Introduction: caries in early childhood is one of the most frequent diseases and can influence the development of the infant. Childhood is a stage characterized by intense learning processes and fundamental in the formation of habits and behaviors in the process of education and human development. It depends on the joint action of teachers, health personnel and legal guardians that infants have access and opportunity to transform health information into knowledge, attitudes and adequate practices that allow them to take care of and protect their health.
Objective: to implement the educational strategy "The Tooth Fairy" in infants in the fifth year of life.
Method: a quasi-experimental before-and-after study with a control group was carried out. The sample consisted of 34 infants in the fifth year of life in the Juan Delio Chacón neighborhood, obtained by simple random sampling.
Results: before the intervention, a poor level of knowledge about oral health predominated in the infants, representing 70,6 % of the experimental group, as well as in the legal guardians and educators for 56,7 %, raising it to good after the intervention in 88,2 % and 86,66 % respectively.
Conclusions: the implementation of the strategy in the educational context, involving families, educators and community proved to be effective since it modified lifestyles and lifestyles, also increasing the level of knowledge about oral health of infants, educators and legal guardians.

Keywords: Oral Health; Dental Caries; Infants; Educational Strategy; Oral Health Knowledge Level.

RESUMEN

Introducción: la caries en la primera infancia es una de las enfermedades más frecuentes, pudiendo influir en el desarrollo del infante. La infancia es una etapa caracterizada por intensos procesos de aprendizaje y fundamental en la formación de hábitos y conductas en el proceso de educación y desarrollo humano. De la acción conjunta entre maestros, personal de salud y responsables legales, depende que los infantes tengan acceso y oportunidad para transformar la información sobre salud, en conocimientos, actitudes y prácticas adecuadas que le permitan cuidar y proteger su salud.
Objetivo: implementar la Estrategia educativa "El Hada de los Dientes" en infantes de quinto año de vida.
Método: se realizó una investigación cuasi-experimental de tipo antes después con grupo control. La muestra fue de 34 infantes de quinto año de vida del Reparto Juan Delio Chacón; obteniéndose mediante muestreo simple aleatorio.
Resultados: antes de la intervención predominó en los infantes el mal nivel de conocimiento sobre salud bucodental representando el 70,6 % del grupo experimental, así como en los responsables legales y educadoras para un 56,7 %, logrando elevarlo a bueno después de la misma en un 88,2 % y 86,66 % respectivamente.
Conclusiones: la implementación de la estrategia en el contexto educacional, involucrando familias, educadoras y comunidad resultó ser efectiva puesto que modificó modos y estilos de vida, incrementando además el nivel de conocimiento sobre salud bucal de infantes, educadoras y responsables legales.

Palabras clave: Salud Bucodental; Caries Dental; Infantes; Estrategia Educativa; Nivel de Conocimiento Sobre Salud Bucodental.

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INTRODUCTION

Early childhood is considered the period of life before six years of age; in turn, it constitutes a crucial stage during which physical, emotional, cognitive, and social transformations occur. Ensuring the healthy and comprehensive development of infants, meeting their needs is fundamental during this life stage. Among these needs, the care of oral health plays a crucial role, to guarantee a proper craniofacial and physical growth and development. Adequate infant development is evidenced by the correct evolution of chewing and swallowing patterns, breathing, and language. Disruptions in any of these functions can lead to negative effects on the quality of life for children.

Health phenomena, when considered from a community perspective, become complex due to the simultaneous interaction of variables of different orders. Ensuring the good health status of infants entails the necessity of policies that consider the coordination among various sectors responsible for guaranteeing the comprehensive development of childhood, in which the family, the community, and the state participate actively.

Early Childhood Caries (ECC) represents a condition that affects the oral health status, defined as the presence of one or more decayed (cavitated or non-cavitated), missing, or filled tooth surfaces in any primary tooth in a child under six years old. Children affected by ECC exhibit twice the number of decayed, filled, and missing teeth at four and six years old, in relation with those who do not suffer from this pathology. Caries has been recognized as the most frequent condition affecting oral health globally in the general population, and with a significant impact on the quality of life of the early childhood population.[1]

The World Health Organization [2] reports that between 60-90 % of children worldwide have dental caries, making it the most prevalent disease in Latin America and Asia. The following studies have demonstrated the increasing and concerning incidence and prevalence of caries in early childhood populations in recent decades: the Fourth National Oral Health Study in Colombia[3], reported a prevalence of 43,77 % and 52,2 % in children aged three and five years, respectively; in Wuhan, China[4], the prevalence was 50,8 %, 63,6 %, and 71,9 % for three, four, and five-year-old children, respectively.

Another study published in Spain[5], reported that out of 121 infants aged three to five years present on the day of the review, there was an incidence of 77,3 %, in the third-course students. In another study published in La Habana province[6], during the period 2020-2022, 158 infants aged between two and five years from the "William Soler Laeda" daycare center (círculo infantil) were examined, and 55 of them were affected by dental caries, accounting for 34,8 %.

Malocclusions rank third among dental alterations. Among the habits most frequently detected in early childhood include: thumb-sucking, mouth breathing, tongue thrust, onychophagia (nail biting), faulty positions during sleep, prolonged use of pacifiers, and biting of lips, pencils, or other objects. A study conducted[7] with the objective of providing updated information about oral deforming habits, 17 texts were selected, where it is revealed that Cuba is the country with the highest prevalence of oral deforming habits at 78,18 %, followed by Mexico and Colombia at 68,2 % and 67 %, respectively, and Venezuela with 56 %, while in Ecuador, the prevalence of these habits is lower, at 52,6 %.

Despite the heterogeneity of the data shown across different countries, the presented estimations suggest that oral conditions represent a significant health problem due to their high prevalence, public demand, and strong impact in terms of pain, discomfort, limitation, and social and functional disability, as well as due to their effect on the quality of life of this population group. In light of this, education in a health-focused culture emerges as a primary prevention action capable of promoting the adoption of healthy habits and lifestyles that can be reproducible throughout life.

Learning strategies are conscious and intentional decision-making processes, in which the student chooses and retrieves, in a coordinated manner, the knowledge needed to meet a particular demand or objective, depending on the characteristics of the educational situation in which the action happens. In this regard, the authors consider that the greatest effort must be directed towards reducing the frequency of oral diseases through the increase of promotional activities within the school setting, in a planned manner. This approach influences favorably on the knowledge, attitudes, and behaviors of infants. It depends on the joint action of educators, health personnel, and legal guardians that infants have access and opportunity to transform health information into knowledge, attitudes, and adequate practices.

The analysis of the above issue led to the formulation of the following scientific problem: How to contribute to raising the level of knowledge about oral health in infants in the fifth year of life from the Juan Delio Chacón neighborhood on the Isla de la Juventud in the year 2023? The general objective of the current research was: to implement the educational strategy "The Tooth Fairy" in infants in the fifth year of life from the Juan Delio Chacón settlement in the year 2023. The specific objectives were:

- To determine the level of knowledge about oral health among legal guardians and educators, before and after the implementation of the educational strategy.
- To determine the level of knowledge about oral health among the study sample, before and after the implementation of the educational strategy.
- To evaluate the effectiveness of the educational strategy.

Through the research results, we contribute to: a study on the existing relationship between the utilization of educational games, theatrical plays, and information technologies; and the level of knowledge about oral health; and an educational strategy as a proposal to increase the level of knowledge of infants, educators, and legal guardians. The present investigation contributes to strengthening the common effort to preserve the social achievements in health and education, consolidating an indissoluble bond not sufficiently achieved in practice. The scientific novelty resides in the proposal of an educational strategy not yet existing in the National Program of Dental Care that contributes to increasing knowledge regarding oral health in infants in the fifth year of life, educators, and legal guardians.

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METHOD

Type of study

A quasi-experimental before-and-after applied research study was conducted with a control group, with infants in the fifth year of life from the Juan Delio Chacón neighborhood, Isla de la Juventud, in the year 2023.

Population and sample

The population for this study consisted of 54 infants aged four to five years from that settlement, who were grouped into two categories; one from the daycare center (círculo infantil) with 34 infants, and the other from non-formal pathways with 20 infants. To determine the sample size, a simple random probabilistic sampling was conducted. The number of infants who were included in each group of the experiment was calculated bearing in mind their enrollment; the calculated sample size was 17 for each group of the experiment. The selection of infants who were measured was carried out using the systematic sampling procedure, which involved selecting 17 infants from the total group, based on a sample interval K. In this way, K=N/n, where N is the total number of children, n is the sample size, and K is a systematic selection interval. Therefore, in the daycare center (círculo infantil) group, where the total number of children was 34, the interval was 2; while the interval was 1 in the non-formal pathways group.

The sample selection process commenced randomly, by selecting a number from a list prepared for this matter, and following the sample interval K until the required number of sample elements was reached. To achieve the initial equivalence, a random assignment of the two groups of the experiment was carried out to determine which would be the experimental group and which the control one. The randomization of the groups involved the use of an unbiased coin. The legal guardians and educators were also grouped into an experimental and a control group, both consisting of the same number of units of analysis (30 per group) and considering the inclusion of the infants under their care in the groups of the experiment.

Inclusion criterion: infants aged 4 to 5 years whose legal guardians provided consent for their participation in the study.

Variables

Dependent variables: level of knowledge about oral health among legal guardians and educators, level of knowledge about oral health among infants in the fifth year of life.

Independent variable: educational strategy “The Tooth Fairy”.

Methods

Theoretical methods (analytical-synthetic, inductive-deductive, historical-logical analysis, and system approach); empirical methods (observation, documentary analysis, survey, and experimental); and mathematical-statistical methods (descriptive and inferential statistics) were used. The results were elaborated and presented in tables and graphs, expressing them in absolute frequencies, relative frequencies, and percentages. Homogeinity tests were applied using the non-parametric Chi-square analysis statistic to assess the relationship between two categorical variables.

Techniques and procedures

An oral health interview (Annex 3) was administered to all infants comprising the sample, both before and after the implementation of the educational strategy, to assess their level of knowledge about oral health. The interview was conducted using educational games and heuristic conversation with the infants.

An educational strategy named “The Tooth Fairy” was designed and implemented in health promotion and education activities for infants in the fifth year of life at the daycare center (Círculo infantil), which resulted the experimental group, over three months with a frequency of two sessions per week. This strategy comprised of six distinct sessions that centered around knowledge about oral hygiene, oral deforming habits, cariogenic diet, and children’s behavior during stomatological care and in the stomatological clinic. It also incorporated control questions to assess the infants after each planned activity. The knowledge survey on oral health appearing in the National Program of Dental Care (PNAE) was administered to legal guardians and educators. Their training using information and communication technologies was included within the strategy’s planning.

Both the educational strategy and the knowledge survey on oral health were validated by expert judgment; among the experts involved included methodologists from the Municipal Directorate of Education in that field, pedagogues with excellent expertise in that field and higher education, doctors in Stomatology, specialists in Comprehensive General Dentistry, Orthodontics, Prosthodontics, Maxillofacial Surgery, Comprehensive General Medicine, Pediatrics, Biostatistics, Higher Education, Masters in Community Oral Health, Dental Emergencies, Clinical Trials, Preschool Education, and Interdisciplinary Studies of Latin America, the Caribbean, and Cuba; graduates in preschool education, psychologists, defectologists, and art instructors.

Techniques for the processing and analysis of the results

The data collection process was carried out through the designed interview. All the gathered information was digitally processed using a computer with Windows 10 as the operating system and Microsoft Office 2016 applications, in particular Word and Excel programs, for text preparation, statistical tables, and graphs.

To assess the relationship between two categorical variables, the non-parametric Chi-square analysis statistic was employed, considering a confidence level of 0,001 and a degree of freedom of 2. It was calculated using the following equation:

$$x^2 = \frac{\sum(O_i - E_i)^2}{E_i}$$

x^2= Chi-square
Oi= observed value
Ei= expected value

Ethical considerations

The data obtained during the study were used in compliance with the Declaration of Helsinki. Informed consent was obtained from the Municipal Directorate of Education, the daycare center director, and the legal guardians of the infants.

RESULTS

Before the implementation of the strategy, there was a predominance of a poor level of knowledge in both the experimental and control groups, with 17 out of 30 individuals for 56,7 % and 15 out of 30 for 50 %, respectively. Only four individuals in the experimental group and five in the control one had a good level of knowledge at that time, with five out of all of them being the educators. After the implementation of the strategy, significant changes were obtained in the experimental group, with a predominance of a good level of knowledge in 26 individuals, accounting for 86,66 %. It can be noted that there is a significant difference in the experimental group regarding the level of knowledge about oral health after the realization of the planned training in the educational strategy; this was not the case in the control group (figure 1).

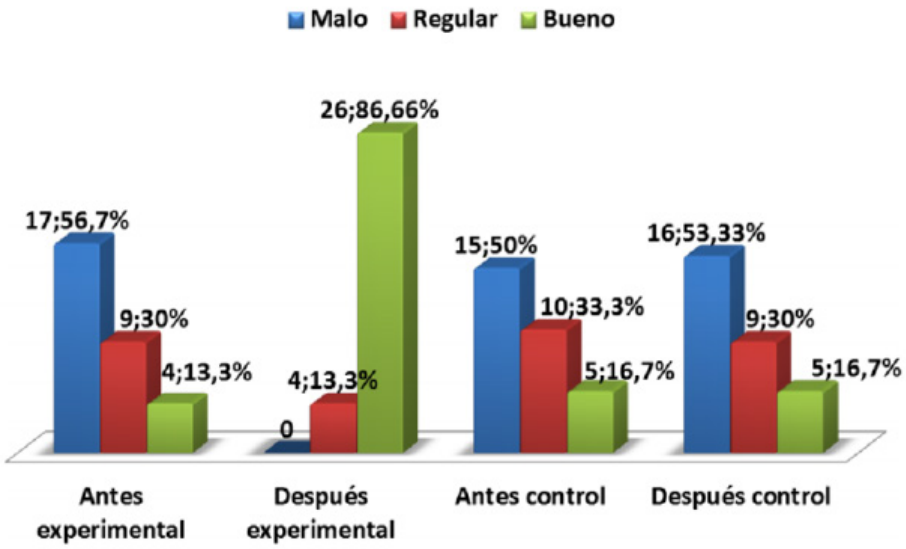

Figure 1. Distribution according to the level of knowledge about oral health among legal guardians and educators of infants in the fifth year of life, before and after the implementation of the educational strategy. Juan Delio Chacón neighborhood, 2023

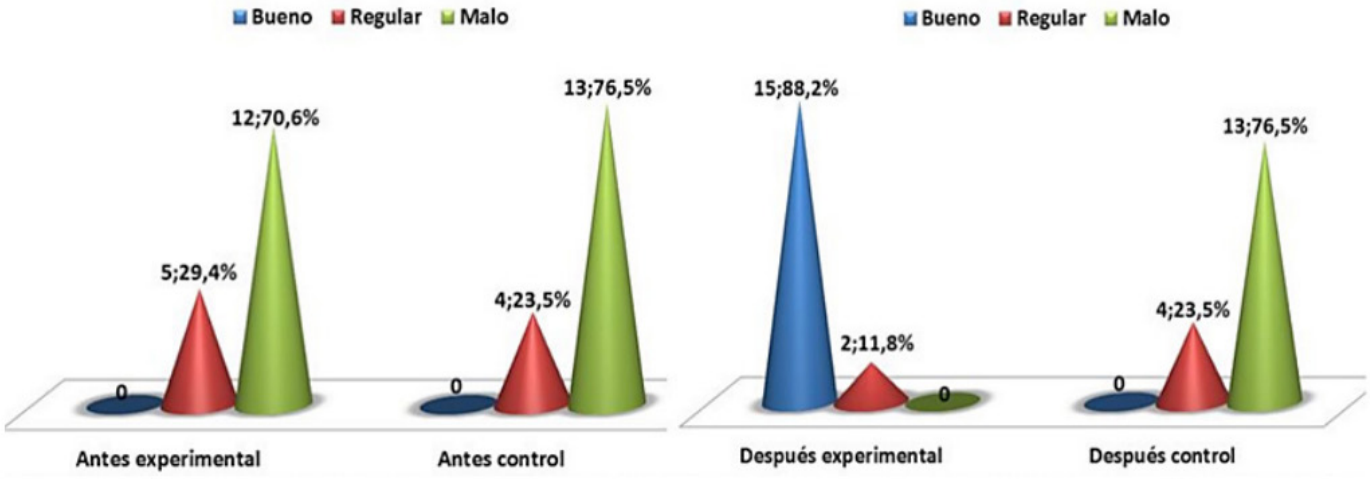

Figure 2. Distribution according to the level of knowledge about oral health among infants in the fifth year of life, before and after the implementation of the strategy. Juan Delio Chacón neighborhood, Isla de la Juventud 2023

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Before the implementation of the educational strategy, there was a predominance of poor knowledge about aspects related to oral health. Out of the 17 infants included in the experimental group, 12 had poor knowledge, accounting for 70,6 %. In the control group, out of the 17 infants, 13 had a poor level of knowledge, representing 76,5 %. After the implementation of the strategy, there were significant changes in the experimental group regarding knowledge about oral health, with a predominance of good knowledge in 15 individuals, accounting for 88,2 %; this was not the case in the control group. Statistically significant differences were observed (figure 2).

DISCUSSION

Through the observation method conducted in the setting where the pre-experiment was developed, it was confirmed that despite the significant potentialities achieved in the Education and Public Health System, these are not utilized for carrying out Health Promotion activities. The principal problems identified were:

- Insufficient training of legal guardians regarding aspects related to health promotion.
- Insufficient training materials related to the promotion and prevention of oral diseases in the institution.
- Lack of flexibility in the school organization and schedules to favor the necessary practices for a healthy lifestyle.
- Hygiene conditions do not correspond to the desired level for the formation of adequate habits.
- A smooth practice in the integration of the educational institution and stomatologists was not achieved at the desired levels, often due to a lack of creativity, limiting the multisectoral nature of actions aimed at promoting health.

The presence of these difficulties evinces a contradiction between what can and must be done in terms of promoting health and disease prevention in educational centers. It is for that reason that the authors consider it necessary to investigate the knowledge that children have about health in order to determine an effective preventive strategy that strengthens cohesion between organisms and organizations.

Health promotion intervenes in the social dimension of the health determinants of the population, and it is an integrative category, essentially intersectoral and involving social participation, so it goes beyond the boundaries of the health sector and extends far beyond of the exclusive competence of medical practice. Collective learning methods turn out to be very attractive and useful to guide the present proposal, allowing for the grouping of people with the same needs, interests, and level of competence. Oral hygiene practices are an individual matter, but it is necessary to educate both the infant and the communities to develop habits that enable them to maintain an adequate oral hygiene.

Most infants have significant gaps in terms of oral health; therefore, health education constituted an essential element in the present research, which had the goal of promoting, organizing, and guiding infants, legal guardians, and educators on what should be done to maintain optimal oral health. The development of the educational component, in this case, was facilitated through educational techniques aimed at encouraging knowledge and reflection on topics related to oral health and the responsibility of self-care as a key factor in cultivating individual, family, and community health. The practice of self-care must be encouraged by health team members, who should provide the population, in collaboration with them, with theoretical and practical means to develop it effectively, considering that through this practice, a more active participation and optimization of material resources will be achieved; an essential aspect in the current economic context.

The major deficiencies identified by the authors were that the infants lacked knowledge about the proper manner and frequency with which toothbrushing, and consequently, its execution is done. Additionally, they did not recognize the main risk factors that predispose to the appearance of oral pathologies. The prevalence of a poor level of knowledge reflects the significant lack of awareness in terms of oral health exhibited by both the infants and legal guardians.

The authors consider that incorporating training actions for legal guardians and educators into the strategy enables not only an increase in the level of knowledge regarding oral health among these individuals, but also among the infants. The data obtained during the research demonstrate the need to design and implement an educational strategy so that, through training for legal guardians and educators as well as the instruction and education of the infants, the knowledge of all involved, and the perception of the risk of disease can be increased.

In this way, the high rates of prevalence and incidence of dental caries and malocclusions at such early ages of life can be diminished, allowing our princes and princesses to smile happily and healthily. After applying the statistical analysis, it was possible to demonstrate that the educational strategy designed and implemented to increase the level of knowledge about oral health in infants in the fifth year of life turned out to be effective, as the variables were found to be significantly related.

Similar results to the present investigation were reported in educational interventions conducted with a favorable effect on the level of knowledge about oral health in caregivers of minors in the Dr. Mario Muños Monroy University Polyclinic, Cuba[8], where knowledge improved from 54,7 % (poor before) to 84,37 % (good after); in Sancti Spíritus, Cuba[9], where insufficient knowledge was increased from 53,2 % to sufficient at 82,3 %; in Lima, Peru[10], medium knowledge was increased from 79,2 % to high in the 83,3 % of those intervened; in eight primary schools in the Huayrapata district, Department of Puno[11], where regular knowledge improved from 65,62 % (before) to 87,5 % (good knowledge, after).

Regarding the effect of educational strategies applied in child populations, there are similarities with the results obtained in Ecuador[12], Peru[13], Ciego de Ávila[14], Miranda-Venezuela[15], and Bolívar-Venezuela[16] in oral health intervention studies in the educational context. After the implementation of the interventions, their effectiveness was demonstrated by increasing the level of knowledge about oral health to good in the intervened children (47,3 %; 93 %; 86,20 %; 86,67 %).

The beginning of the new century imposes two challenges: to demonstrate and communicate in a way that health promotion

policies and practices can make a difference in the health and quality of life of infants. In order to meet the fundamental objectives of the contemporary Cuban society, it is essential that this new person of the future, to whom we open the doors of knowledge, is shaped as an integral whole; the maintenance of an adequate oral health status constitutes a premise for that.

CONCLUSIONS

At the beginning of the intervention, a poor level of knowledge about oral health predominated among the infants, legal guardians, and educators. The implementation of the educational strategy "The Tooth Fairy" in the educational context, involving families, educators and community proved to be effective since it increased the level of knowledge about oral health of infants, educators, and legal guardians.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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