ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at:www.ijdsir.com
Volume – 8, Issue – 3, May – 2025, Page No. : 37 - 48

Influence of Parents' Educational Level on Knowledge, Attitudes, and Practices Regarding Oral Health in Preschool Children Aged 3 To 5 in Catamayo, Ecuador

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Citation of this Article: Rossana Sempértegui R, Carlos Molina, Jenny Collantes, "Influence of Parents' Educational Level on Knowledge, Attitudes, and Practices Regarding Oral Health in Preschool Children Aged 3 To 5 in Catamayo, Ecuador", IJDSIR- May – 2025, Volume – 8, Issue – 3, P. No. 37 – 48.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Education plays a crucial role in children's health, personal development, and social impact. Throughout life, the educational process acts as a powerful tool that can reduce health inequities in adulthood. Health education, understood as a set of learning opportunities based on communication and information strategies, aims to develop skills for maintaining individual and collective health.

This study aims to analyze the influence of parents' educational level on their knowledge, attitudes, and practices (KAP) regarding the oral health of children aged 3 to 5 in schools in Catamayo. For this purpose, a cross-sectional observational survey was conducted, collecting 461 records on demographic characteristics and topics related to dental caries, prevention, diet, and oral hygiene. The final sample consisted of 455 children from a population of 908, with a margin of error of 0.05 and a 95% confidence level.

A KAP indicator was established on a scale from 0 to 10, where 0 represents lack of knowledge, negative attitudes, and poor practices, and 10 represents the opposite. The general results showed positive averages: 7.3 in knowledge, 8.0 in attitudes, and 7.7 in practices. Although statistically significant differences were found between some groups, these were not considered relevant from a numerical standpoint.

Keywords: Health Behavior, Health Knowledge, Attitudes, Practice, Oral health.

Introduction

Understanding knowledge, attitudes, and practices is essential for gaining a deeper insight into culture, as well as being key to identifying the specific informational needs of parents and/or caregivers[1]. This understanding facilitates the selection of appropriate methods for designing and implementing oral health education strategies tailored to the socio-economic and cultural context of the community [1]. Parents and/or caregivers play a fundamental role as the primary social influence in child development. Appropriate intervention during the early stages of life lays the foundation for the development of abilities, competencies, skills, adaptations, learning, and oral health levels, among other aspects [1].

Education plays a crucial role in children's health and overall development, generating a lasting social impact[2]. Therefore, the educational process becomes an essential factor in reducing adverse conditions [2]. As parents' educational level increases, children's oral health conditions improve, similarly, a more positive parental attitude toward health, following participation in educational processes, is also positively associated with children's health status [2].

Knowledge, attitudes, and practices in oral health are essential for the prevention and treatment of diseases, however, dental caries remains one of the leading causes of oral morbidity worldwide [3]. In Ecuador, the situation is no different, as oral health is not considered a priority by the population due to factors such as socioeconomic and cultural conditions, lack of education, among others, this leads many people to visit the dentist only when a symptomatic issue affects their daily activities [3].

Children under the age of five typically spend most of their time with their mother and/or family members, during these early years of socialization, they adopt routines, habits, and behaviors that are established as norms in their home, which are influenced by the knowledge, attitudes, and practices of their parents, caregivers, and surrounding environment [4]. Parental or caregiver knowledge, beliefs, and attitudes about oral health directly impact their children's oral health maintenance, dietary habits, and behaviors related to oral care [4].

Actions to protect children's oral health depend on parental or guardian participation in maternal and child health programs, as well as in general pediatric care. However, a major challenge lies in securing parental collaboration in preventive care and at-home oral health practices [4]. Early childhood dental caries is a serious public health issue, as children who experience caries in early childhood are more likely to develop cavities in both primary and permanent dentition, as well as experience pain while eating [5]. For this reason, the support of professionals, health organizations, and institutions is essential through comprehensive early childhood care programs, providing recommendations for the development of healthy habits throughout different life stages [7].

All efforts made within family, institutional, and governmental settings to improve these behaviors could have a significant impact on reducing both oral and general diseases [6].

A good quality of life is closely linked to oral health; for this reason, the WHO includes oral health in all its general health programs, both at the community and national levels, redirecting its efforts toward health promotion and disease prevention, additionally, the organization develops priority areas in oral health through activities aligned with its global policies [8].

Knowledge is the result of the process of understanding; it is what an individual acquires when they comprehend

the object they come to know, as a rational being, the human assimilates reality and mentally internalizes its components, through language, they are able to transmit this knowledge to others, from generation to generation [9].

It is related to the ability to acquire, retain, and apply information by combining understanding, experience, judgment, and skill, on the other hand, it also refers to the level at which a person assimilates data without forming an opinion about it, which reflects a higher mental state—knowledge [9].

Attitudes are consistent feelings, whether positive or negative, toward an object, they represent a state of mind expressed in a particular way or manner (such as a conciliatory attitude), they can also refer to a person's body posture (when effectively conveying something or when posture reflects an emotional disposition) or that of an animal (when it draws attention for some reason).[10]

There is no linear progression between attitudes and behaviors; often, a change in attitude precedes a change in behavior. However, a change in behavior can also influence or even precede a change in attitude [9].

Practices are the application of rules and knowledge that guide an individual's actions. In this context, related to the study, it refers to the implementation of the knowledge a mother has regarding her child's oral health [11].

Oral health in the early years of life is crucial to ensuring healthy growth and development in children. Issues such as untreated early childhood caries can cause pain, infections, difficulties in eating and speaking, and may even negatively impact a child's learning and socialization[12]. Moreover, it has been shown that oral health at this stage has a significant impact on the quality of life of both the child and their family [12].

Health in early childhood is a fundamental pillar for the comprehensive development of individuals, this period, which spans from birth to the first five years of life, is critical for establishing a solid foundation in physical, cognitive, emotional, and social growth [13].

During early childhood, the brain undergoes rapid development, reaching up to 80% of its adult size within the first three years (Grantham-McGregor, 2007), this growth is strongly influenced by factors such as nutrition, access to medical care, and adequate stimulation, early interventions can mitigate the negative effects of malnutrition and stress, promoting optimal development [14].

Comprehensive health at this stage includes physical aspects, such as access to vaccines, and psychological aspects, such as secure attachment with caregivers, the formation of strong emotional bonds during the early years has a positive impact on long-term mental and emotional well-being [15].

Primary health care also plays a fundamental role. The World Health Organization highlights the importance of preventive strategies such as exclusive breastfeeding, hygiene promotion, and the prevention of infectious diseases, in order to reduce infant mortality and improve quality of life [8].

The family and social environment is also a crucial determinant, investments in early development generate significant economic and social benefits, as children who receive adequate care are more likely to achieve educational and professional success in the future [16].

Children's oral health is an essential component of their overall well-being, as it affects both their quality of life and their physical and emotional development [17]. Factors such as diet, oral hygiene, caregiving practices, and access to dental services play a crucial role in preventing

common oral diseases, such as dental caries and periodontal disease [17].

Diet is a key determinant of children's oral health, and excessive sugar consumption is one of the main risk factors for the development of oral diseases, the World Health Organization identifies high sugar intake as a major contributor to the formation of dental caries, one of the most prevalent chronic diseases in childhood [18]

This study aims to evaluate the influence of parents' educational level on their knowledge, attitudes, and practices regarding oral health in preschool children aged 3 to 5 in Catamayo, Ecuador. It also seeks to establish a model that can be replicated in other communities to improve children's oral health through education and awareness.

Materials and Methods

A cross-sectional observational study is proposed. The study population consists of 908 school-aged children (3 to 5 years old) from fiscomisional, private, and public schools, according to the Ministry of Education [19]

The selected parents and/or legal guardians of children aged 3 to 5 from both public and private and fiscomitional schools in Catamayo were recruited.

For this study parents who signed the informed consent and those who had full mental capacity to understand the questions that were part of the instrument.

After coordination with District 11D02 Catamayo Chaguarpamba Olmedo – Education, contact will be made with the District Director for the submission of the relevant documents in order to obtain the necessary permits.

A construct of sociodemographic questions will be used, including educational level, place of residence, age, and gender, along with previously validated questions from the construct Parental Knowledge of Preschool Children's Oral Health: Development and Validation *of an Instrument.* This survey consists of 20 questions designed to measure the influence of parents' educational level on their knowledge, attitudes, and practices regarding dental caries, prevention, diet, and oral hygiene [20].

Informed consent was obtained from the parents and/or legal guardians. This document clearly explains the purpose of the research, the procedures involved, and the potential benefits and risks.

This study approved by the Ethics Committee of Universidad de Los Hemisferios and received approval on October 7, 2024,

In this context, an initial description of the group is presented, followed by an evaluation of the affirmative responses in the section questions. Finally, the CAP indicator is established as the aggregate of correct answers, normalized to a 10-point scale, where 0 indicates no knowledge, poor attitude, and bad practices, while 10 represents the opposite.

The results of each section are analyzed according to the educational level, as well as the child's age, type of guardian, guardian's age, and type of educational institution. For group comparisons, p-values from chi-square tests are presented to determine whether the variables of interest are associated with the responses provided by the guardians. Additionally, Kruskal-Wallis tests are used to compare scores among three or more groups, and median tests are applied for two-group comparisons. Confidence interval graphs for proportions (percentages) and averages, constructed at a 95% confidence level, are also included.

For data processing, the open-source software R v.4.4.1, available at the time of analysis, is used.

Results and Discussion

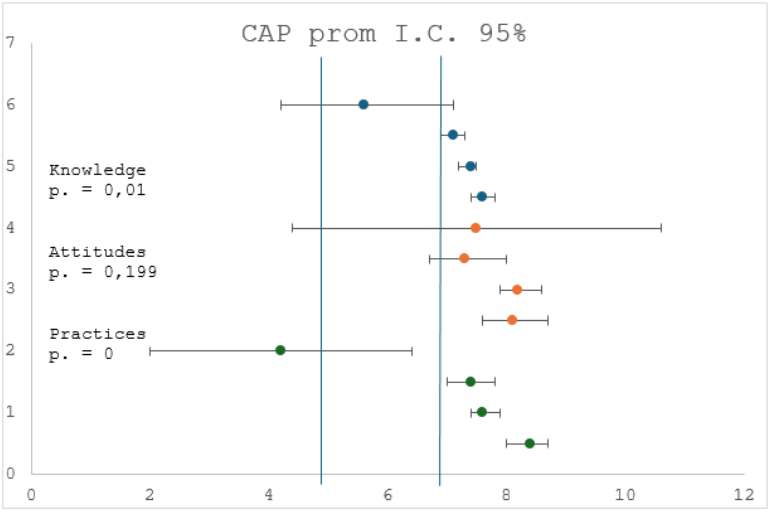
The results showed a significant difference in average knowledge according to the level of education (p =

0.001), indicating that higher education levels are associated with greater knowledge. Regarding attitudes, no statistically significant difference was found (p = 0.199), nor was a clear trend identified. On the other hand, practices showed a significant difference (p = 0.000), suggesting that a higher level of education is associated with better practices [table 1].

Table 1: Descriptive Statistics of CAP According to Education Level

KAP Dimension	Education Level	Sample	Min	Max	Mode	Median	Mean	SD	CV(%)	Lower Limit	Upper Limit
Knowledge	None	6	1.7	7.2	6.6	6.5	5.6	1.9	32.8	4.2	7.1
	Primary	108	3.3	9.4	7.9	7.4	7.1	1.2	17.4	6.9	7.3
	Secondary	231	1.1	10.0	7.4	7.5	7.4	1.1	15.6	7.2	7.5
	Technical and/ or Higher Ed.	116	1.7	9.4	7.8	7.7	7.6	1.1	14.2	7.4	7.8
	Total	461	1.1	10.0	7.7	7.5	7.3	1.2	16.2	7.2	7.4
Attitudes	None	6	0.0	10.0	10.0	9.4	7.5	3.8	50.9	4.4	10.6
	Primary	108	0.0	10.0	10.0	9.1	7.3	3.5	47.8	6.7	8.0
	Secondary	231	0.0	10.0	10.0	9.5	8.2	2.7	32.9	7.9	8.6
	Technical and / or Higher Ed.	116	0.0	10.0	10.0	9.5	8.1	2.9	35.6	7.6	8.7
	Total	461	0.0	10.0	10.0	9.5	8.0	3.0	37.5	7.7	8.2
Practices	None	6	0.0	7.5	2.8	5.3	4.2	2.8	66.3	2.0	6.4
	Primary	108	0.0	10.0	7.5	7.6	7.4	2.1	28.4	7.0	7.8
	Secondary	231	2.5	10.0	7.5	7.7	7.6	2.0	26.0	7.4	7.9
	Technical and/ or Higher Ed.	116	2.5	10.0	10.0	8.7	8.4	1.8	21.9	8.0	8.7
	Total	461	0.0	10.0	7.5	7.7	7.7	2.1	26.7	7.5	7.9

Fig 1: Average CAP (95% C.I.) by Education Level

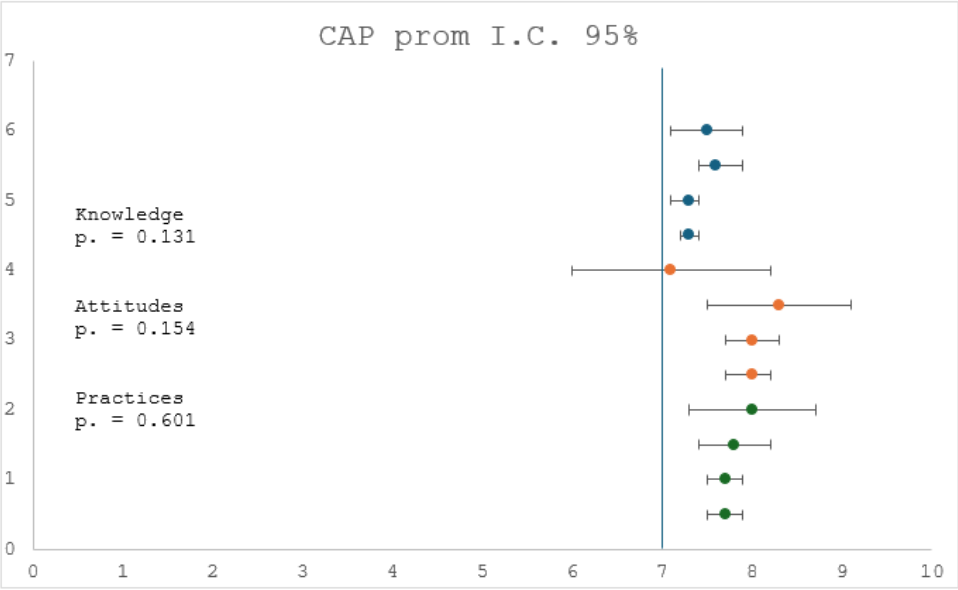


Regarding the child's age, the average knowledge did not show a significant difference (p = 0.131), nor did it indicate a clear trend based on age. Similarly, attitudes did not present a statistically significant difference (p = 0.154) or a defined trend. Lastly, practices also did not reflect a significant difference (p = 0.601), indicating the absence of a relationship between the child's age and the evaluated practices [table 2].

Table 2: Descriptive Statistics of CAP According to Child's Age

KAP	Child's Age	Sample	Min	Max	Mode	Median	Mean	SD	CV (%)	Lower Limit	Upper Limit
Knowledge	3 years	36	4.4	10.0	7.9	7.7	7.5	1.2	15.8	7.1	7.9
	4 years	56	5.6	9.4	7.7	7.7	7.6	0.9	12.2	7.4	7.9
	5 years	369	1.1	9.4	7.7	7.4	7.3	1.2	16.7	7.1	7.4
	Total	461	1.1	10.0	7.7	7.5	7.3	1.2	16.2	7.2	7.4
Attitudes	3 years	36	0.0	10.0	10.0	8.5	7.1	3.4	48.1	6.0	8.2
	4 years	56	0.0	10.0	10.0	9.5	8.3	2.9	34.7	7.5	9.1
	5 years	369	0.0	10.0	10.0	9.5	8.0	2.9	36.8	7.7	8.3
	Total	461	0.0	10.0	10.0	9.5	8.0	3.0	37.5	7.7	8.2
Practices	3 years	36	2.5	10.0	7.5	8.3	8.0	2.1	26.4	7.3	8.7
	4 years	56	2.5	10.0	7.5	7.7	7.8	1.6	21.0	7.4	8.2
	5 years	369	0.0	10.0	7.5	7.7	7.7	2.1	27.5	7.5	7.9
	Total	461	0.0	10.0	7.5	7.7	7.7	2.1	26.7	7.5	7.9

Figure 2: Average CAP (95% C.I.) by Child's Age



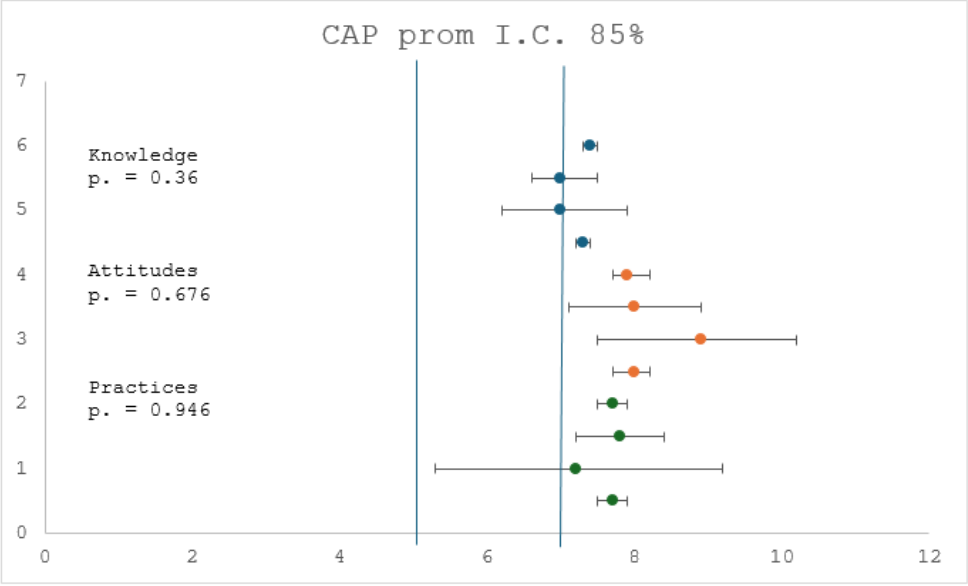
Regarding the type of guardian, the average knowledge did not show a significant difference (p = 0.360), although there is a slight tendency for mothers to have greater knowledge. In terms of attitudes, no significant difference was found (p = 0.676); however, other guardians exhibited a better attitude compared to fathers

and even mothers. Finally, practices did not show a significant difference (p = 0.946), indicating the absence of a clear trend based on the type of guardian[3].

Table 3: Descriptivos del CAP según tipo de tutor

KAP	Informant	Sample	Min	Max	Mode	Median	Mean	SD	CV (%)	Lower Limit	Upper Limit
Knowledge	Mother	407	1.1	10.0	7.7	7.5	7.4	1.2	15.7	7.3	7.5
	Father	45	1.7	9.4	7.7	7.4	7.0	1.4	19.6	6.6	7.5
	Guardian	9	4.4	8.9	7.1	7.4	7.0	1.3	19.0	6.2	7.9
	Total	461	1.1	10.0	7.7	7.5	7.3	1.2	16.2	7.2	7.4
Attitudes	Mother	407	0.0	10.0	10.0	9.5	7.9	3.0	37.7	7.7	8.2
	Father	45	0.0	10.0	10.0	9.3	8.0	3.1	38.2	7.1	8.9
	Guardian	9	5.0	10.0	10.0	10.0	8.9	2.1	23.4	7.5	10.2
	Total	461	0.0	10.0	10.0	9.5	8.0	3.0	37.5	7.7	8.2
Practices	Mother	407	0.0	10.0	7.5	7.7	7.7	2.0	26.4	7.5	7.9
	Father	45	2.5	10.0	7.5	8.0	7.8	2.1	26.4	7.2	8.4
	Guardian	9	2.5	10.0	9.3	8.9	7.2	3.0	41.4	5.3	9.2
	Total	461	0.0	10.0	7.5	7.7	7.7	2.1	26.7	7.5	7.9

Figure 3: Average CAP (95% C.I.) by Type of Guardian

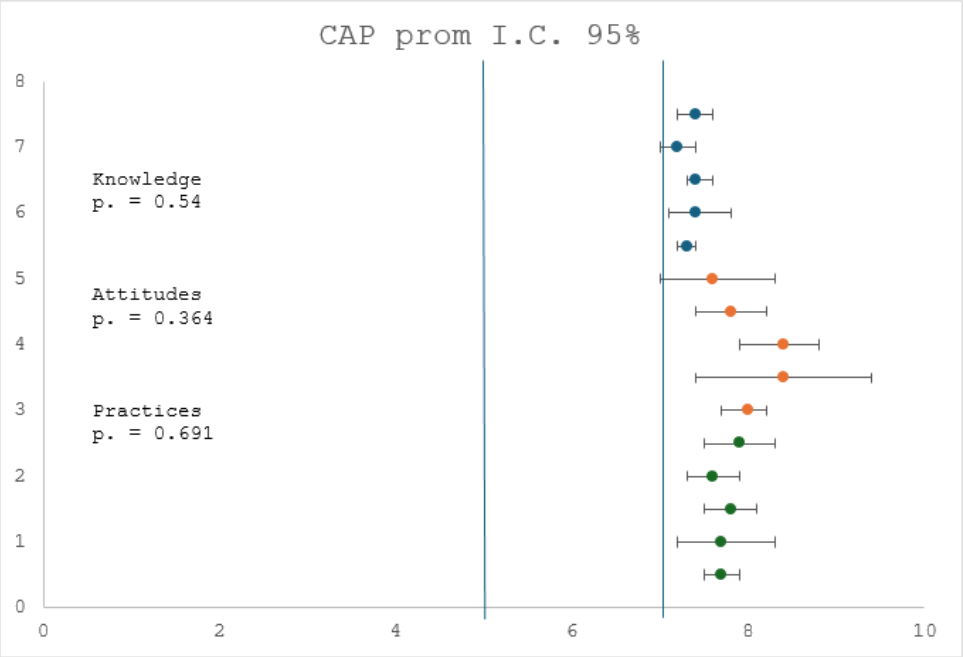


Regarding the respondent's age, the average knowledge did not show a significant difference (p = 0.540), nor did it indicate a clear trend in relation to age. Similarly, practices did not present a significant difference (p = 0.691), indicating the absence of a relationship between the respondent's age and the evaluated practices. However, in the case of attitudes, although no statistically significant difference was found (p = 0.364), there is a perceived trend suggesting that older respondents tend to exhibit better attitudes[4].

Table 4: Descriptive Statistics of CAP According to the Age of the Guardian

KAP	Age Group	Sample	Min	Max	Mode	Median	Mean	SD	CV (%)	Lower Limit	Upper Limit
Knowledge	18–25	89	4.4	8.9	7.7	7.6	7.4	1.0	14.1	7.2	7.6
	26–35	213	1.1	9.4	7.7	7.4	7.2	1.3	18.3	7.0	7.4
	36–45	137	1.7	10.0	7.7	7.6	7.4	1.1	14.6	7.3	7.6
	45+	22	5.6	8.9	7.8	7.6	7.4	0.8	10.9	7.1	7.8
	Total	461	1.1	10.0	7.7	7.5	7.3	1.2	16.2	7.2	7.4
Attitudes	18–25	89	0.0	10.0	10.0	9.2	7.6	3.3	42.9	7.0	8.3
	26–35	213	0.0	10.0	10.0	9.4	7.8	3.1	39.8	7.4	8.2
	36–45	137	0.0	10.0	10.0	9.5	8.4	2.6	31.6	7.9	8.8
	45+	22	5.0	10.0	10.0	10.0	8.4	2.3	27.7	7.4	9.4
	Total	461	0.0	10.0	10.0	9.5	8.0	3.0	37.5	7.7	8.2
Practices	18–25	89	2.5	10.0	7.5	8.0	7.9	2.0	26.0	7.5	8.3
	26–35	213	0.0	10.0	7.5	7.7	7.6	2.2	29.5	7.3	7.9
	36–45	137	2.5	10.0	7.5	7.8	7.8	1.9	23.9	7.5	8.1
	45+	22	5.0	10.0	7.5	7.7	7.7	1.3	16.6	7.2	8.3
	Total	461	0.0	10.0	7.5	7.7	7.7	2.1	26.7	7.5	7.9

Figure 4: Average CAP (95% C.I.) by Guardian's Age



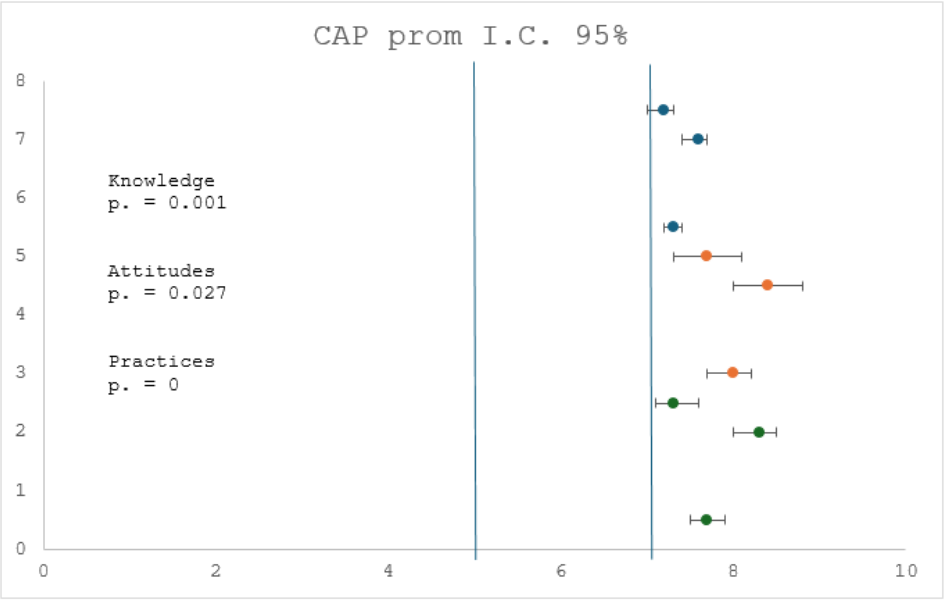
Regarding the type of institution, a significant difference was found in average knowledge (p = 0.001), showing that respondents from private schools have a higher level of knowledge. Similarly, attitudes also showed a

significant difference (p = 0.027), with respondents from private schools demonstrating a more positive attitude. Additionally, practices reflected a highly significant difference (p = 0.000), indicating a marked superiority in practices among private schools compared to public schools[5].

Table 5: Descriptive Statistics of CAP According to the Type of Institution

KAP	Institution Type	Sample	Min	Max	Mode	Median	Mean	SD	CV (%)	Lower Limit	Upper Limit
Knowledge	Public (Fiscal)	278	1.1	9.4	7.2	7.3	7.2	1.3	17.5	7.0	7.3
	Private	183	3.9	10.0	7.8	7.7	7.6	1.0	13.6	7.4	7.7
	Total	461	1.1	10.0	7.7	7.5	7.3	1.2	16.2	7.2	7.4
Attitudes	Public (Fiscal)	278	0.0	10.0	10.0	9.4	7.7	3.1	40.6	7.3	8.1
	Private	183	0.0	10.0	10.0	9.6	8.4	2.7	32.6	8.0	8.8
	Total	461	0.0	10.0	10.0	9.5	8.0	3.0	37.5	7.7	8.2
Practices	Public (Fiscal)	278	0.0	10.0	7.5	7.5	7.3	2.1	29.0	7.1	7.6
	Private	183	2.5	10.0	10.0	8.3	8.3	1.8	22.0	8.0	8.5
	Total	461	0.0	10.0	7.5	7.7	7.7	2.1	26.7	7.5	7.9

Figure 5: CAP promedio (I.C. 95%) según tipo de institución



The results of this study demonstrate a significant relationship between parents' educational level and their knowledge and practices regarding the oral health of their children aged 3 to 5 years. The average knowledge scores showed a significant difference (p = 0.001), indicating that a higher level of education is associated with greater awareness of oral health. These findings align with previous studies, such as Sharma et al. (2020),

which reported a positive correlation between educational level and the understanding of the importance of children's oral care. Similarly, Ramos et al. (2019) found that parents with higher education levels had more detailed knowledge about cavity prevention and the proper use of a toothbrush.

On the other hand, regarding attitudes, no significant difference was found (p = 0.199), nor was there a clear trend suggesting that a higher educational level leads to more favorable attitudes toward oral health. This result is similar to findings reported in studies such as García and López (2018), which suggest that while knowledge may be influenced by formal education, attitudes can depend on other factors, such as personal experience and cultural influences. In contrast, studies like that of Kim et al. (2021) have indicated that specific educational programs can significantly modify parents' attitudes toward their children's oral health.

Practices, on the other hand, showed a significant difference (p = 0.000), indicating that a higher level of education is associated with better oral hygiene practices among parents for their children. This finding is consistent with studies such as Fernández et al. (2017), which concluded that the adoption of healthy habits largely depends on parents' ability to access information and apply what they have learned. Additionally, a study by Wu et al. (2022) found that parents with higher education levels demonstrated greater adherence to regular dental visits and stricter supervision of their children's toothbrushing routines.

Given the above, it is recommended that future research expand the study population and include other factors that may influence children's oral health, such as socioeconomic status and barriers to accessing dental services. Additionally, it would be relevant to design longitudinal studies to assess the long-term impact of parents' educational level on their children's oral health. It is also suggested to explore educational intervention strategies targeted at parents with lower levels of education to improve their oral hygiene practices.

Conclusion

The results of this study demonstrate that the educational level of parents has a significant influence on their knowledge and oral health practices regarding the care of preschool-aged children (3 to 5 years old) in Catamayo, Ecuador. Parents with higher levels of education showed greater knowledge and more appropriate oral hygiene practices for their children. These findings confirm the main objective of this research, which was to evaluate the influence of parents' educational level on their knowledge, attitudes, and practices related to children's oral health.

Although attitudes did not show a statistically significant relationship with the educational level, this suggests that attitudes may be influenced by other factors such as culture, family beliefs, prior experiences, or the social environment. Therefore, the study emphasizes the need for more comprehensive strategies that address not only the educational aspect but also sociocultural and psychological dimensions that shape parental behavior.

Furthermore, based on the analysis and the practical recommendations derived from the findings, this research also fulfills its second objective: to propose a model that can be replicated in other communities. The study highlights the importance of implementing educational and awareness programs tailored to different parental education levels as a viable strategy to improve children's oral health. By focusing on accessible educational tools, interdisciplinary collaboration, and long-term follow-up, this model can serve as a foundation for similar interventions in other contexts with comparable socio-educational characteristics.

In conclusion, the objectives of the study were successfully achieved. First, it was confirmed that parental educational level significantly influences knowledge and practices related to oral health in children. Second, the findings allow for the design of a replicable model for other communities, contributing to the broader goal of reducing childhood oral disease through education, prevention, and community engagement. These results reinforce the pediatric dentist's role not only as a clinical practitioner but also as an educator and advocate for family-centered oral health promotion.

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