

Oral health of youth housed in socio-educational centers of the Juvenile Penal Area of the Province of Córdoba, Argentina

María M. Barnetche, Lila S. Cornejo

Universidad Nacional de Córdoba, Facultad de Odontología, Grupo de Investigación Interdisciplinario "Promoción Contextualizada". Argentina

ABSTRACT

The purpose of this research was to analyze the oral health status of youth housed in socio-educational centers of the Juvenile Penal Area of the Province of Córdoba, Argentina of corrections by considering clinical evaluation and the main socio-demographic data. Socio-demographics, healthy and unhealthy habits of self-care, and dental clinical profile were assessed for this purpose. An exploratory cross-sectional study was carried out on 70 14- to 18-year-olds who had been institutionalized for at least six months. A clinical examination was conducted and the WHO Oral Health Survey was applied. Centralization and dispersion measurements, relative frequency, multiple correspondence analysis and generalized linear models were used to describe the data. The results showed: males 94%, mean age 16.91 ± 1.11 , complete primary schooling 34%, from Córdoba City 69% and belonging to nuclear families 29%. Regarding healthy habits, 71% had frequent sugar intake, and

46% brushed teeth daily; while among unhealthy habits, 80% smoked tobacco, 63% drank alcohol and 73% used psychoactive substances. Sixty-three percent had visited a dentist once, and in 80% of the cases reason for the visit was pain. Clinical examination showed high prevalence of deterioration of the oral health component ($DMFT = 8.94 \pm 4.75$, $SiC = 14.26 \pm 2.15$, $IPC3 = 56\%$, $MO = 53\%$).

Clinical profile showed marked prevalence of a very high level of caries severity, gingival disease and malocclusion, but not of initial stages of caries, alterations of enamel or temporomandibular dysfunction.

The socio-demographic characteristics revealed conditions of social, educational and health vulnerability, a situation which interferes with the inclusion of these youths in the productive system and their access to better living conditions.

Key words: oral health, adolescent, vulnerable populations.

Salud bucal de jóvenes alojados en centros socioeducativos del Área Penal Juvenil de la Provincia de Córdoba, Argentina

RESUMEN

El propósito de esta investigación fue analizar la situación de salud bucal de jóvenes alojados en centros socioeducativos del Área Penal Juvenil de la Provincia de Córdoba, a través de la evaluación clínica teniendo en cuenta los principales datos sociodemográficos. Para tal fin se valoraron las características sociodemográfica; los hábitos saludables, no saludables, de autocuidado y el perfil clínico odontológico. Se desarrolló un estudio transversal exploratorio en 70 jóvenes, de 14 a 18 años de edad, alojados por un periodo no menor a seis meses. Se realizó examen clínico y se aplicó la Encuesta de Salud Bucal de la OMS. Para la descripción de los datos se aplicaron medidas de centralización y de dispersión, frecuencia relativa, análisis de correspondencia múltiples y modelos lineales generalizados. Los resultados mostraron el siguiente perfil sociodemográfico: 94% son varones con una edad media de $16,91 \pm 1,11$ que tienen primario completo 34%, son procedentes de la Ciudad de Córdoba 69% y pertenecen a familias nucleares 29%. Respecto

a los hábitos saludables el 71% de los jóvenes tienen una alta frecuencia de consumo de azúcares, el 46% presenta frecuencia diaria de cepillado dental; entre los hábitos no saludables el 80% consume tabaco, 63% bebidas alcohólicas, y 73% SPA, el 63% concurre al odontólogo alguna vez por dolor (80%). El examen clínico mostró una alta prevalencia del deterioro del componente bucal de la salud ($CPOD = 8,94 \pm 4,75$; $SIC = 14,26 \pm 2,15$; $IPC3 56\%$; $MO 53$).

El perfil clínico mostró una marcada prevalencia del nivel muy alto de severidad de caries, enfermedad gingival y maloclusión, no así de los estadios iniciales de caries, alteraciones de esmalte y disfunción temporomandibular. Las características sociodemográficas halladas ponen de manifiesto condiciones de vulnerabilidad social, educativa y sanitaria, las cuales interfieren en su incorporación al sistema de producción y acceso a mejores condiciones de vida.

Palabras clave: salud bucal, adolescentes, grupos vulnerables.

INTRODUCTION

Oral health in young people is an essential factor for the economic and political process in all countries, particularly disadvantaged countries such as those

in Latin America¹. It is essential to vital functions such as nutrition, communication, affection and sexuality, in addition to its relationship with physiological, psychological and social aspects².

Most youths who have broken criminal laws and are institutionalized in socio-educational centers run by the juvenile delinquency office of Córdoba Province first learn nutrition, hygiene and study habits upon entering these establishments. It is often during their first dental visit here that they express their needs, ailments and pains. They often report never having visited a physician, and are even less likely to have visited a dentist, highlighting the inequity in access to learning health habits³.

Social vulnerability is defined as the combination of various social, age, gender and economic events, among others, which prevent subjects or groups from being included in development and having access to better welfare conditions⁴. From this standpoint, youth living at socio-educational centers run by the juvenile delinquency office can be considered vulnerable groups.

The World Health Organization (WHO)⁵ considers that the most prevalent oral conditions are dental caries (60% to 90% of school and adult population, and 85% to 97% in Latin American countries)⁴ and periodontal disease (70% of the world population)⁵. Craniofacial anomalies and malocclusions are of medium frequency, while pathologies of soft tissues, alterations of dental tissues, maxillofacial trauma and dental fluorosis are of variable frequency⁶.

High prevalence of dental caries is recognized as the primary cause of missing teeth, the negative impact of which is appraised by pain, suffering, loss of function and alteration of quality of life; all of which make it a public health issue at community level.⁷ Dental caries affects the population regardless of age, sex or social level.

The etiology of dental caries is multifactorial. Some researchers mention early colonization by microorganisms, accumulation of plaque in the oral cavity and socio-demographic factors as well as eating habits and oral hygiene. There are also socio-environmental factors such as availability of healthcare services, oral health programs, socioeconomic level, area of residence, educational level, occupation, stress, ethnicity, culture and housing type, among others.

White spot lesions are a clinically visible initial stage of caries lesions, and constitute a warning signal for preventive practices.

The most prevalent periodontal condition is gingivitis. Epidemiological studies have shown that

it is common in childhood, more prevalent in adolescence and becomes stable at older ages⁵.

Examination of the oral cavity and detailed exploration of the oral mucosa are important tools for the diagnosis of developmental alterations, infectious and inflammatory diseases and neoplastic pathologies⁶. Prevalence of oral disease is mainly associated to adult age, and world literature reports few cases of oral mucosa conditions in children and adolescents⁶.

Epidemiological studies of soft tissues in the oral cavity conducted in recent years have found considerable variation in the prevalence of oral mucosa lesions according to world geographic location⁷.

Several etiological factors are related to oral mucosa lesions, including toxic, infectious, genetic, emotional and socioeconomic agents. Lesions of the mucosa are therefore considered to have multicausal origin. The most prevalent are lesions in which etiopathogenesis involves cultural, educational and nutritional factors⁷. According to the WHO, malocclusion takes third place among oral diseases⁸. Simões⁸ defines malocclusions as musculoskeletal growth problems during childhood and adolescence, which may produce aesthetic problems involving teeth and face, as well as alterations in masticatory, phonation and occlusal functions. Moreover, the appearance of teeth deviating from the norm may stigmatize a subject, who may be rejected in his/her peer group, fostering a negative stereotype with adverse effect on self-esteem. It may limit opportunities when dental appearance is important, so that poor tooth positioning may become an obstacle to career aspirations and opportunities⁸. This points to the need to consider the importance of malocclusions in the context of subjects' oral health and quality of life⁸.

From the standpoint of public health, distribution of malocclusions according to severity is important because it enables priorities to be established. In this regard, the Dental Aesthetic Index (DAI) classifies malocclusion according to severity and need for treatment. The DAI is a cross-cultural, universal, highly reproducible instrument which is very easy to use and therefore useful in epidemiological studies⁹.

Full examination of the oral component should include evaluation of the temporomandibular joint (TMJ) in order that temporomandibular disorders

(TMD) do not go unnoticed⁹. The WHO⁹ considers the following criteria for evaluation of TMJ: presence or absence of symptoms such as clicking, pain or difficulty to open and close jaw once or several times a week; signs of clicking, pain on palpation of anterior temporal and masseter muscles, and reduced jaw mobility (aperture less than 30 mm).

TMDs include a complex, heterogeneous group of alterations of clinical conditions which affect not only TMJs, muscles involved in mandibular movements, teeth and supporting structures, but also cervical muscles and associated structures, which cause non-dental pain in the orofacial region, limitation of mandibular movements and joint noises such as crepitation and clicking. The etiology of TMD signs and symptoms is multifactorial, with a strong bio-psycho-social component¹⁰. For proper diagnosis, risk factors should be taken into account, including occlusal interferences which can cause repetitive muscle overloading, as well as psychological conditions such as anxiety, frustration and parafunctional habits (nail biting, bruxism)¹¹.

The WHO⁹ has proposed the “oral health survey” with the aim of providing sustainable, replicable bases for evaluating the oral health needs of populations in all regions. The survey provides a systematic method for recording information on oral component status and need for treatment through oral and extraoral clinical examination complemented by socio-demographic data, personal and family background and whether the subjects follow healthy habits.

The aim of this study was to analyze oral health status in youths housed in socio-educational centers of the Juvenile Penal Area of the Province of Córdoba, Argentina through clinical evaluation, taking into account the main socio-demographic data. The description of the situation may contribute to the creation of strategies for providing care for the needs of this population.

MATERIALS AND METHODS

A descriptive cross-sectional study was performed on 70 14- to 18-year-olds of both sexes who had been living at socio-educational centers of the Juvenile Penal Area of the Province of Córdoba for at least six months, and signed their informed consent. The study was conducted considering the guidelines of the Council for International

Organizations of Medical Science (CIOMS), which establishes the guidelines for application of the principles of the Declaration of Helsinki, adopted by the World Medical Association in 1964 and amended in 1975, 1983 and 1989. The work protocol was approved by the Advisory Council of the PhD Course at the School of Dentistry of Córdoba National University (UNC) (Resolution No. 284/2011.)

The WHO Oral Health Survey⁹ was used to determine the oral component status of participating youths, extended with the following dimensions: socio-demographic characteristics, use of psychoactive substances, self-care practices, dental chart and Löe and Silness plaque index, validated in the context with Cronbach's Alpha coefficient, $\alpha = 0,74$.

Clinical examination was performed by a single operator (intra-rater kappa reliability: 0.77), at a dental office in the institution, using explorers and periodontal probes. The WHO⁹ criteria were used for diagnoses.

Data were processed using Infostat¹² statistical software.

Caries process was evaluated following the criteria established in Bordoni et al.¹³ Plaque index, SiC, DMFT, CPI and DAI (Dental Aesthetic Index) were calculated, and need for treatment determined in each case⁹. The behavior of quantitative variables is described using centralization and dispersion measures: mean \pm SD and median for discrete variables. The behavior of qualitative variables is described using Relative Frequency expressed as percentages.

WS+DMFT (sum of teeth with presence of White Spot and DMFT) was constructed as variable of interest, as an indicator of teeth with caries clinical disease in each patient. Values range from 0 to 32. Multiple Correspondence Analysis (MCA) was applied to the following variables: use of psychoactive substances, visits to the dentist, head of family, subject's level of education and WS+DMFT.

Generalized Linear Models (GLM) were applied. Fixed effect models were fitted. Penalized-likelihood criteria (AIC and BIC)¹⁴ were applied to select the model. The explanatory variables considered were classified as shown in Table 1.

In order to establish the patterns of differences for variables with significant effect on WS+DMFT, multiple comparison test - DGC Test¹⁵ was applied.

RESULTS

Socio-demographic characteristics

The study included 70 participants, 94% male and 6% female, 14 to 18 years old, mean age 16.91±1.11, with 37% being 18 years old. Of these, 34% had completed primary school, 69% resided in Córdoba City, and 69% had informal job experience (Fig.1).

Table 1: Classification of variables*

Variables	Categories
Psychoactive substances	Joint/marijuana Paco/cocaine/ mix-multiple use None
Visit to dentist	Public Private None
Head of household	Father Mother Other
Schooling	Illiterate/ Inc. primary/ complete primary Inc. secondary/ complete secondary
WS+DMFT	<10 ≥10

(*)Own research

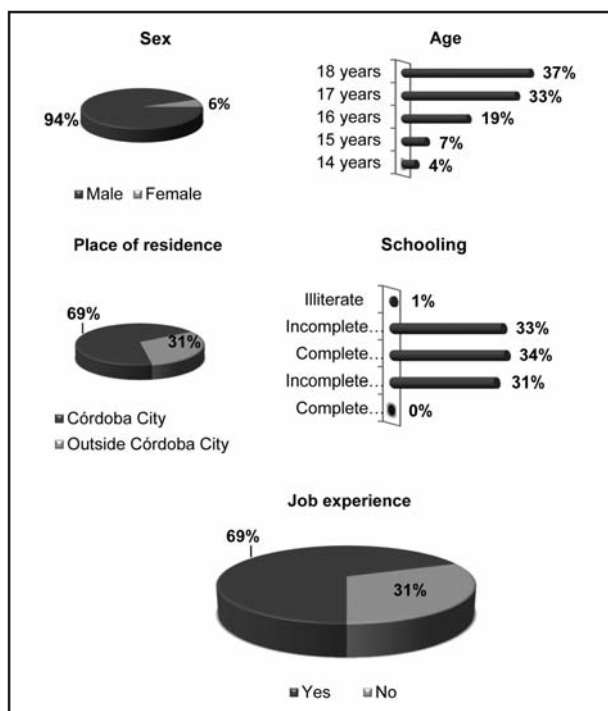


Fig. 1: Distribution of the study population according to individual background.

Participants in the study mostly came from nuclear or single-parent families; only 1% lived at public welfare institutions by judicial ruling. The head of family was mother in 36%; with informal type occupation in 67%. Thirty-six percent of the heads of families had completed primary education (Fig.2). Ninety-three percent of the participants lived in traditionally built housing; 90% had running water provided by public utility and 81% had urban transportation stopping near their homes (Fig. 3).

Unhealthy habits

Twenty percent of participants said they smoked 15 to 20 cigarettes a day, and 20% said they did not smoke. Sixty percent drank alcohol on weekends,

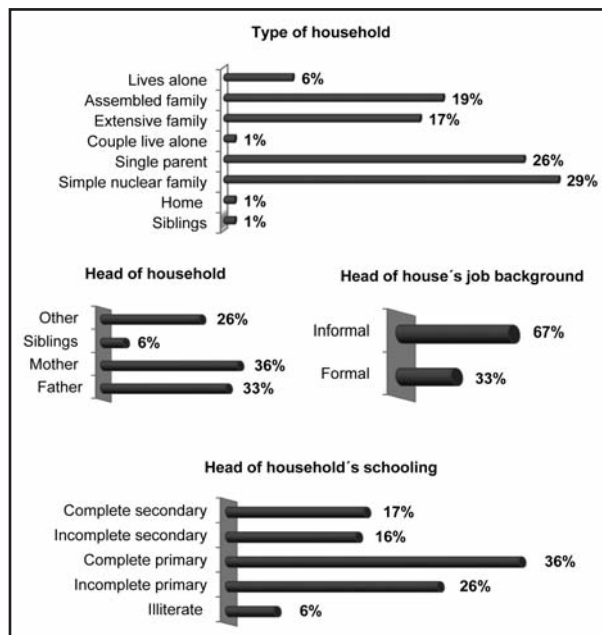


Fig. 2: Distribution of the study population according to family background.

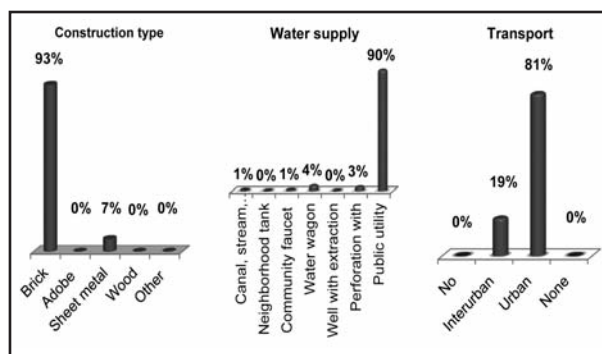


Fig. 3: Distribution of the study population according to housing, water supply and transport.

at parties or social gatherings. Thirty-seven percent used a mix of psycho-active substances (marijuana, cocaine, pills) in a single event; and 47% used psychoactive substances every day(Fig.4).

Healthy habits

Forty-six percent of participants said they ate four meals a day; 29% ate only two meals a day, omitting breakfast and afternoon snack. Sugar intake between meals was more than four times a day in 71% of the study population. Forty-six percent of participants said they brushed their teeth every day and 36% said they brushed their teeth in the morning (Fig.5).

Self-care habits

Eighty-three percent and 63% of participants said they had at some time visited a physician and a dentist, respectively. Reasons for the visits were pain and infection in 69% for physicians and 80% for dentists. For visits to a physician, 95% used public institutions. For dental care, 23% used private dental

offices. Twenty-one percent of participants said they were covered by health insurance managed by workers' unions (*obra social*) (Fig. 6).

Clinical-dental assessment

Clinical inspection of the study population showed “normal appearance” in the extra-oral examination (no ulceration, inflammation, erosion, fissures, lip anomalies, oral cancer, among others)⁹for 89%. Sixteen percent presented some temporomandibular joint symptom, the main signs being clicking in 20% and pain in 19% (Fig.7).

Intraoral inspection of participants showed disorders of the oral mucosa represented by cheilitis in 17%, while the rest had normal appearance (Fig. 8).

As shown in Table 2, the mean value for DMFT index was 8.94±4.75. The decayed component was highest, with mean value 7.44±4.26. The degree of severity was very high in 70% of the study population, according to WHO criteria taken from Bordoni et al.¹³ Fig. 9 shows distribution of enamel

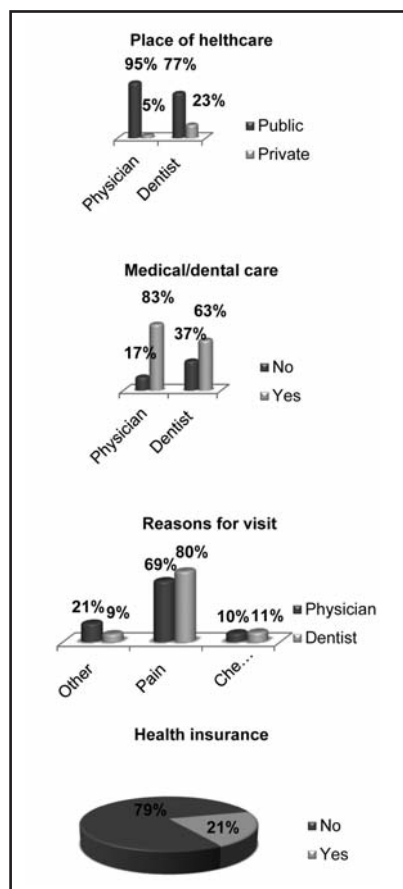
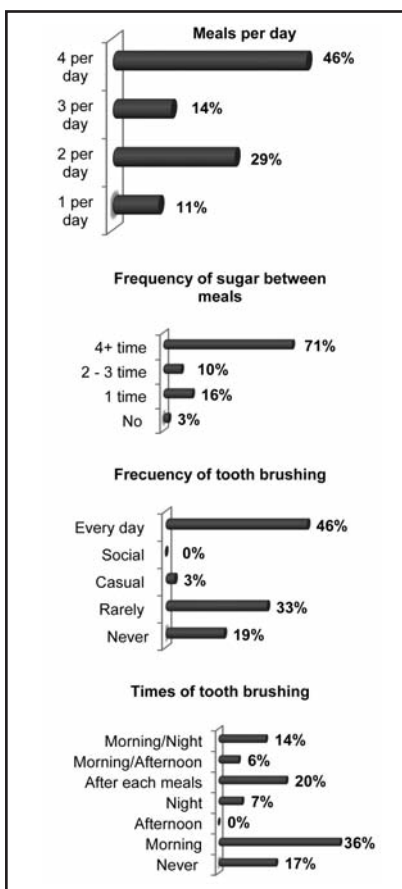
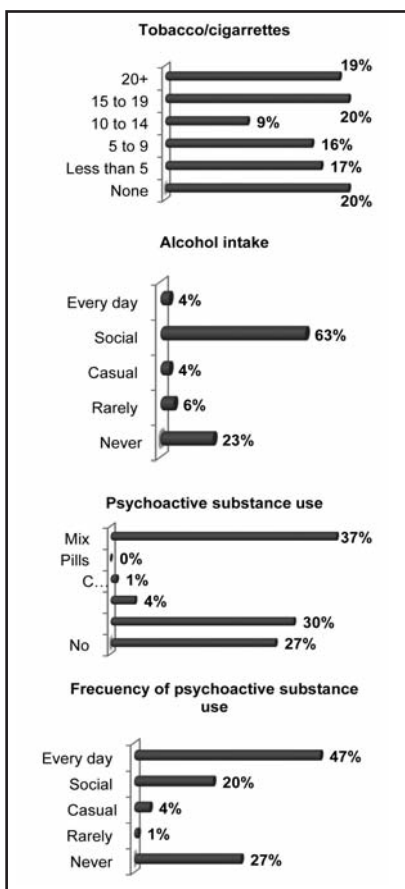


Fig. 4: Distribution of the study population according to unhealthy habits.

Fig. 5: Distribution of the study population according to healthy habits.

Fig. 6: Distribution of the study population according to self-care habits.

Table 2: Mean and median of DMFT, it's components and SIC*

Variable	Mean ± SD	Median
Teeth present in mouth	28.14 ± 4.53	28
DMFT	8.94 ± 4.75	9
SIC	14.26 ± 2.15	14
Decayed teeth	7.44 ± 4.26	7
Missing teeth	0.6 ± 0.91	0
Filled teeth	0.9 ± 1.97	0

(*) Own research

lesions, caries and need for treatment in the study population. Twenty-one percent of the participants had some alteration of dental enamel such as opacity and hypoplasia, as well as white spot, and 67.14% needed rehabilitation treatment.

Mean value for the Löe and Silness index was 0.33±0.12. Community periodontal index (CPI) was consistent with gingival-periodontal health in 3% of participants. In the CPI category distribution, 56% had dental calculus and 40% had gingival hemorrhage (Fig.10). The data collected in the survey section on anomalies of teeth and

lips, according to the Dental Aesthetic Index (DAI) criteria⁹, enables dentition, spacing and occlusion components to be analyzed separately or as a group. It was found that 50% of the study

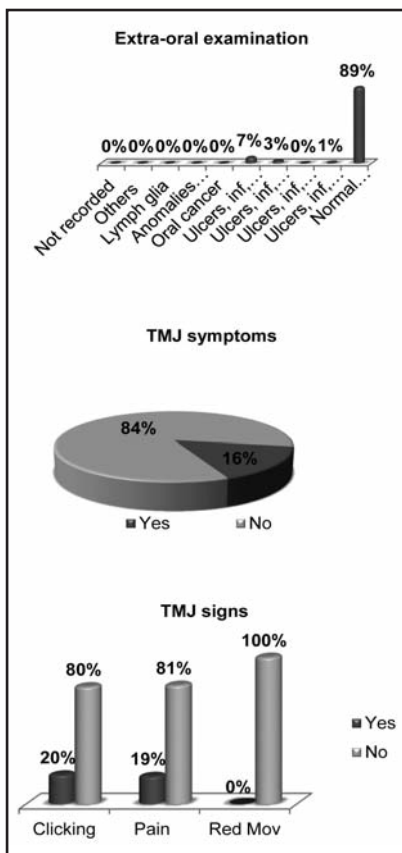


Fig. 7: Distribution of the study population according to findings in extraoral examination.

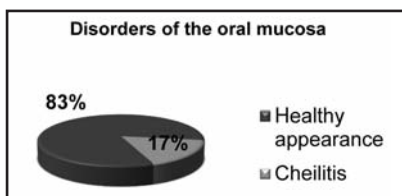


Fig. 8: Distribution of the study population according to disorders of the oral mucosa.

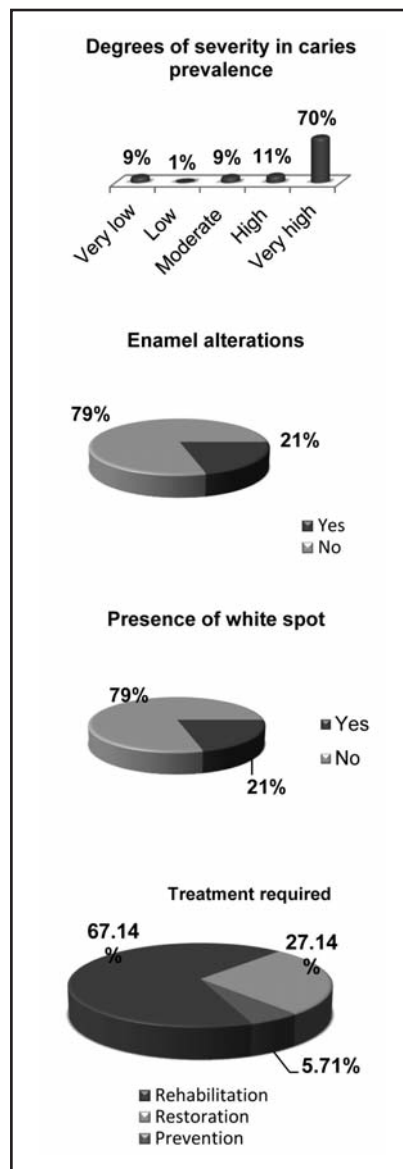


Fig. 9: Distribution of the population according to enamel lesions, caries and need for treatment.

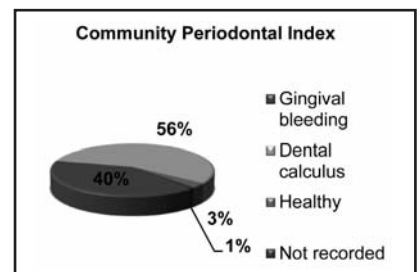


Fig. 10: Distribution of the study population according to the CPI.

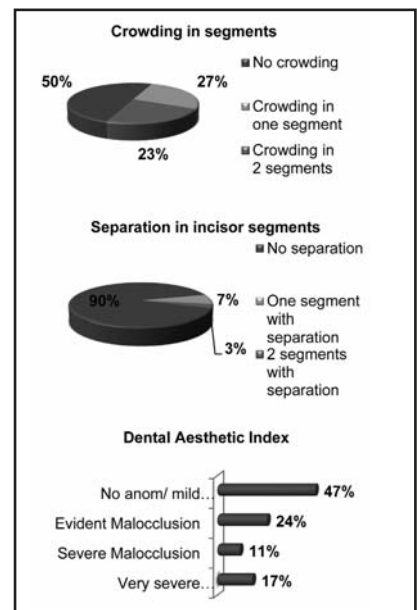


Fig. 11: Distribution of the study population according to dental-labial anomalies.

population did not have crowded teeth, 62% had normal molar relationship, and 90% did not present separation in incisor segments. Fifty-three percent of the study population presented malocclusion, with severe and very severe malocclusion in 17%, according to the DAI categories (Fig.11).

Variables associated to caries clinical stages

Multiple Component Analysis groups youths whose heads of family were neither father nor mother, and who used psychoactive substances, especially marijuana, had not visited a dentist and were illiterate/primary schooled. Although WS+DMFT does not provide an important discrimination measure, the category >10 is located closer to this group (Fig. 12). Another group includes subjects who did not use

psychoactive substances, had attended secondary school, whose head of family was the father and who had visited a dentist.

Sequential hypothesis tests for fixed effects (Table 3) determined that the following variables are regressors to the model, with significant effect on WS+DMFT: frequency of alcohol intake, use of psychoactive substances, frequency of sugar intake, need for prosthesis, disorder of the mucosa, and enamel opacities/hypoplasia. Covariates are plaque index and age.

Variables with significant effect on WS+DMFT found by applying DGC are: use of psychoactive substance, frequency of alcohol intake, frequency of sugar intake between meals, disorders of mucosa, enamel opacities and/or hypoplasia, and need for prosthesis (Table 4).

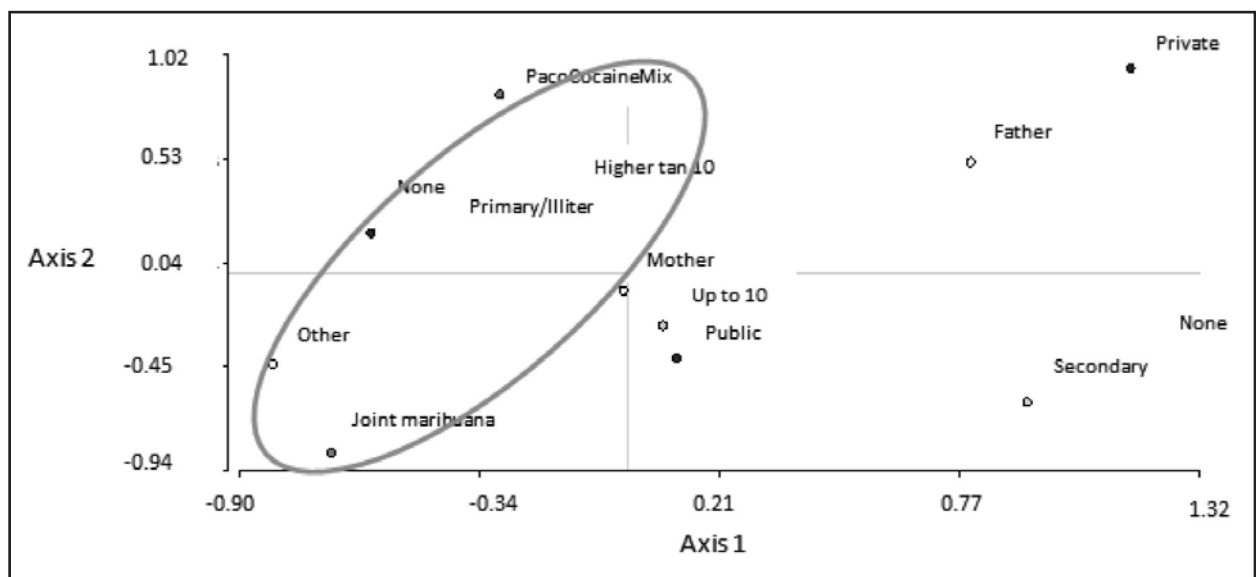


Fig. 12: Multiple correspondence analysis between WS+DMFT and socio-demographic variables, use habits and self-care habits.

Table 3: Sequential hypothesis testing for fixed effects.

	Df	Deviance	Resid. Df	Resid. Dev	Pr(>Chi)
NULL			69	301.42	
Frequency of alcohol intake	1	8.17	68	293.25	0.0043
Use of psychoactive substances	2	12.86	66	280.4	0.0016
Frequency of sugar intake between meals	1	15.6	65	264.8	0.0001
Disorder of oral mucosa	1	15.38	64	249.42	0.0001
Enamel opacity/hypoplasia	1	24.48	63	224.94	<0.0001
Need for prosthesis	1	13.26	62	211.67	0.0003
Plaque index	1	15.05	61	196.63	0.0001
Age	1	13.4	60	183.23	0.0003

Table 4: Variables which have a significant effect on WS+DMFT resulting from the application of DGC.

Variable	Category	PredLin	S.E	Mean	S.E	
Use of psychoactive substances	Joint/marijuana	-1.16	0.12	0.24	0.02	A
	Paco/cocaine/mix	-1.2	0.1	0.23	0.02	A
	None	-1.25	0.12	0.22	0.02	B
Frequency of alcohol intake	Rarely/ never	-1.03	0.11	0.26	0.02	A
	Social/always	-1.38	0.09	0.2	0.01	B
Frequency of sugar between meals	Twice or more	-1.02	0.08	0.26	0.02	A
	Up to once	-1.38	0.14	0.2	0.02	B
Disorder of mucosa	YES	-1.07	0.11	0.26	0.02	A
	NO	-1.33	0.09	0.21	0.01	B
Enamel opacity and/or hypoplasia	YES	-0.97	0.08	0.27	0.02	A
	NO	-1.43	0.13	0.19	0.02	B
Need for prosthesis	YES	-0.94	0.1	0.28	0.02	A
	NO	-1.46	0.01	0.19	0.02	B

Means with the same letter do not differ significantly ($p>0.05$).

DISCUSSION

The socio-demographic profile of the youths in confinement who took part in this study was similar to that in other studies conducted on youths who had broken the law.

In our study population, sex was predominantly male (94%), as in findings of studies conducted on youth that had broken the law in Asturias (M: 90%; F: 10%)¹⁶, and in 2012 in Mexico (M: 97.5%; F: 2.5%)¹⁷.

Although few local studies have been conducted on this type of population to date, one study performed in 2008 in the same context found a similar ratio between sexes (M: 96%; F: 4%)³.

This predominance of male sex may be related to the construction of identity in males, which leads to being on the streets, where they are exposed to multiple risk factors. In Argentina, as in other parts of the world, there are no groups of law breakers made up exclusively of females, but rather, girls take part in the role of collaborators³.

Although mean age (16.91 ± 1.11) has not varied substantially from findings in the year 2008 at the same institution (16.42 ± 0.82), there has been a change in predominant age (mode). In the current study, 37% of the youths were 18 years old, while in the previous study, 42% were 16 years old³. To date, we have no available information on potential institutional or social factors that might explain this. Other studies on youth in conflict with the law report average age 15.5 years in Asturias¹⁶ and 15 ± 1.83 years in Colombia¹⁸, while mean age in

Mexico was 18.05 years, with predominance (30%) of 18 years¹⁷.

With regard to provenance of the youths in the study, there was an increase in the proportion of residents from the interior of Córdoba Province, Argentina, compared to a previous study at the same centers³.

For level of schooling, youths in the current study were found to have a higher level than that found in studies conducted on teenagers residing in the "Closed Regime Center" (*Centro de Régimen Cerrado*) in Buenos Aires City and Units for young adults run by the Federal Penitentiary Service in 2012, where 66% of the participants had not completed primary schooling¹⁹.

Regarding jobs, our study found a high proportion of youths with job experience (69%), as was true of their parents, in contrast to the results found in Buenos Aires for youths detained at closed centers in 2012, (11% of the youths with job experience, 66% of mothers and 44% of fathers did not work)²⁰. Job experience among these youths was informal, and the activities they had performed were related to construction, automobile mechanics, and delivery, among others.

Predominant family organization in this study was nuclear family, in contrast to the findings in the same context in 2009, where the most frequent was single-parent families. In both studies, however, the mother acted as head of household³.

Our enquiries about the habits of participants were always referred to their practices prior to entering these socio-educational centers.

With regard to unhealthy habits, the use of psychoactive substances such as marijuana, cocaine, psychopharmacological drugs and mix/multiple drugs every day was lower in this study than the rate reported by drug-dependent youths before entering rehabilitation programs in Córdoba City¹⁹. The Sub-regional Report on drug use in school population, through a study conducted in 2007 showed a 35% prevalence of multiple drug use and/or mix in Argentina²¹. These data are consistent with our research, which found that multiple drug use/mix was highest, with 37%, followed by marijuana (30%). This reflects a strong tendency towards multiple drug use which has already been noted in other studies on drug-dependent youths undergoing rehabilitation¹⁹.

The frequencies found for use of tobacco (80%) and alcohol (77%) in this study are much higher than those in a study on minors who had broken the law in the Principality of Asturias in 2012 (tobacco: 10.3%; alcohol: 16.4%)¹⁶. It should be noted that use of alcohol was limited to social occasions and weekends, and both alcohol and tobacco were used more frequently by youths living outside Córdoba City. The difference in the reports regarding these habits between youths living inside and outside Córdoba City is noteworthy, suggesting that it is more difficult for youths living outside Córdoba City to obtain psychoactive substances.

Use of psychoactive substances began at an early age –12 to 14 years – which is younger than the age observed in studies on drug-dependent youths¹⁹. This may be because youths in the current study perceived no barriers to access to these substances, and the use of marijuana was deemed natural in their reports of smoking a “joint” every day, in agreement with observations from other studies on adolescents in Córdoba, Argentina²². The youths considered smoking a joint to be similar to smoking a cigarette, and distinguished it from other psychoactive substances, such as cocaine (which they referred to as “drug”) and pills. They distinguished the effects of each and explained multiple use by the need to counteract some of the effects. Alcohol was drunk at social gatherings or parties and often combined with other substances. In their current situation of confinement, tobacco was smoked a lot and helpful at times of anxiety and boredom.

With regard to healthy and self-care habits prior to entering the institutions (Fig. 5), four meals a day

were reported with the greatest frequency. When fewer meals a day were reported, breakfast and afternoon snack were omitted.

Our study showed that youths’ oral-dental care habits (tooth brushing) were more deficient than those observed in Chile²³; in Asunción, Paraguay among 14-to 16-year olds at schools during 2015²⁴; and in Spain among 2- to 15-year-olds from June 2006 to June 2007²³. Sugar intake between meals was lower than among children and youths in Spain (89.03%)²⁵; and higher than among 12- to 14-year-olds in Venezuela (53.3%) in 2011²⁶.

For visits to the dentist, the youths in the current study reported a similar frequency for use of oral-dental health care services as children and adolescents in Spain²⁵, and lower frequency than in the Community of Valencia, Spain, in 2004, where the main reason for visiting a dentist is pain/ infection²⁷.

With regard to extraoral examination, the population in the current study showed prevalence of “some temporomandibular joint (TMJ) symptom” in 16%, which is worse than the rate found in studies on a population of over 18 years of age in the Municipality Trinidad (1.3%) in 2010¹¹; and better than the rate found in a study in Uruguay on 15- to 39-year olds undergoing treatment for problematic drug use²⁸. The predominant signs in our study were prevalence of pain and clicking, which was not as bad as rates found in studies on 13- to 18-year old students in Temuco, Chile, who presented joint noise (F: 35.6%; M: 40.4%) and periauricular pain (F: 20.3%; M: 3.5%)¹⁰. Clicking and pain of the temporomandibular joint were worse in a group of drug-dependent youths (25.71%, 14.28%) in Córdoba City²⁹. Alterations in children are mostly mild, while in adolescents they reach 75.8%, with clicking being the only sign³⁰. Pain has greater predominance in females than males³¹ and during puberty and middle age than in old age and young childhood¹⁰.

Intraoral examination in this study showed that 11% of the youths had disorders of the oral mucosa, a rate somewhat higher than that found in pediatric patients, among whom 7.4% presented lesions¹⁵. The rate of stomatological lesions was similar in youths from peripheral urban schools and drug-dependent youths from the Cambio Program (34.48% and 31.43%, respectively), but differed from the 25.86% in youths from Córdoba City center schools²⁹.

The DMFT values found in this study (DMFT = 8.94 ± 4.75) are similar to those found in drug-dependent youths in Córdoba (7.14 ± 5.01)²⁹. This value shows a population with high risk of caries, according to WHO criteria⁹ and these results are far from the millennium goals proposed by different Latin American institutions, which aim for DMFT 1 to 2.9 for 2015 in Latin America³².

Significant Caries Index (SiC = 14.26 ± 2.15) in our study population was similar to that in a group of drug-dependent youths in the Cambio Program (12.91 ± 2.87), and twice as high as the index for youths from schools in central and marginal Córdoba City, 7.45 ± 2.60 ; 7.20 ± 2.44 , respectively²⁹; and for adolescents and young adults in Mexico³³.

This information showed that the group at highest risk had DMFT index values which were twice as high as those observed in the whole sample, suggesting the need for greater and better monitoring of this group and implementation of programs at all three levels of healthcare.

Our study found 21% prevalence for presence of white spot (0.49 ± 1.19), which was only half as much as the percentage for drug-dependent youths undergoing recovery (49.18%) in Córdoba, Argentina³⁴; and lower than the mean values recorded in comparative studies on youths attending pre-university school (2.56 ± 4.8), peripheral urban school (2.82 ± 4.73) and drug recovery program (4.5 ± 5.9) in Córdoba, Argentina²⁹. This may be related to differing individual diagnostic criteria. On the other hand, this low frequency for white spot in youths in confinement may be related to the incorporation of oral hygiene habits upon entering these institutions.

In the current study, 79% of the youths presented some structural alteration of enamel (opacity and/or hypoplasia), which was higher than the value found in a study on 6- to 17-year-old schoolchildren (39.8%) in Cuba³⁵. These alterations occur during the dental enamel formation stage and may be associated to different local, systemic and hereditary factors. The different causes these youths have been exposed to may be related to physical conditions and eating habits, among others, of their mothers during pregnancy; infections and local trauma to teeth; hypocalcemia, high fever, allergies, prenatal and perinatal diseases, and nutritional deficiencies suffered by these youths.

With regard to prevalence of periodontal pathologies, the community periodontal index showed low

prevalence of the status compatible with gingival-periodontal health in youths in this study, and no data were recorded indicating advanced stages of periodontal disease. Indices for presence of plaque were low, in contrast to those found in studies on drug-dependent youths in Córdoba City¹⁹. Frequency of gingival bleeding is somewhat higher than values found in studies on 11- to 15-year-olds (37.5%) in Cuba³⁵. These differences may be related to different factors such as examination conditions issued by the WHO⁹, where a lower number of teeth is recorded in subjects 20 years of age, and in subjects under 15 years old, loss of insertion should not be recorded, and only hemorrhage and calculus should be considered. This situation of gingival-periodontal health may be related to the way in which these youths perform their oral hygiene, suggesting the possibility of implementing promotional and preventive actions.

Prevalence of malocclusion in this study was 53%, similar to the value found in youths in the drug rehabilitation program (57.71%), and better than in youths at a peripheral urban school (65.62%) but worse than in youths at schools in central Córdoba City²⁹ and in studies conducted in Uruguay (33.8%)³⁶. Dental Aesthetic Index (DAI) showed prevalence of malocclusions (MO) where the highest frequency was represented by youths without alterations or with slight malocclusion, while the proportion with very serious malocclusion was smaller. These data are higher than those from the previously mentioned study³⁶ regarding defined MO: 18.8%, severe 6.49% and very severe 8.54%; while it is higher than normal occlusion with 66.2%. These results show a more adverse malocclusion situation among the participants in our study.

The factors found in this study which are related to presence of caries lesions are: head of household role not filled by father or mother, use of psychoactive substances/marijuana, not visiting the dentist and schooling level illiterate/primary school. As in other studies³⁷, the results reinforce the idea of the effect of psychoactive substances on caries lesions in their different stages (WS+DMFT>10).

In contrast to the results of a binary logistic regression multivariate analysis applied to a population of 6- to 12-year-old children in Mexico³⁷ which showed risk of caries presence associated to a study zone (city or greater city) and mother's schooling, in our study, use of psychoactive substances, frequency of alcohol

intake, frequency of sugar intake between meals, disorder of the mucosa, need for prosthesis, enamel opacity/ hypoplasia and the covariates plaque index and age are explanatory variables that arise from applying the generalized linear statistic model. These differences may be consistent with the difference in ages considered in these studies. As age increases, various lifestyle-related factors and anatomical-physiological conditions appear which are responsible for interactions and particular synergy that may affect the presentation of different stages of caries.

Some authors have explained the association of psychoactive substance and alcohol use with pathologies of the oral component³⁸.

ACKNOWLEDGMENTS

We are grateful to the Juvenile Penal System of Córdoba Province, Argentina, for allowing the research to be conducted. We thank María Inés Ahumada and Laura Isabel Luna from the Department of Statistics and Demographics at the School of Economic Science of Córdoba National University, Argentina for their cooperation with statistical processing of data.

REFERENCES

1. Tuesca-Molina R, Centeno-Romero H, Salgado MO, García-Delgado N, Lobo- López J. Calidad de vida relacionada con la salud y determinantes sociodemográficos en adolescentes de Barranquilla (Colombia). *Rev Sal Univ* 2008;24:53-63. URL: <https://search.proquest.com/openview/a7881f2095a2de470b0964ae79b29b45/1?pq-origsite=gscholar&cbl=2027436>.
2. López Castellanos G, López Ramírez LB, Nachon García MG, Hernández Lunagomez D. Salud bucal, salud percibida y calidad de vida en adultos mayores. *Rev Med UV* 2014; 14: 6-11. URL: https://www.uv.mx/rm/num_antteriores/revmedica_vol14_num2/articulos/salud.pdf.
3. Barnetche MM. Factores de riesgo de salud en adolescentes con restricción de la libertad en establecimientos correccionales de la Ciudad de Córdoba. Escuela de Salud Pública. Facultad de Ciencias Médicas. Universidad Nacional de Córdoba; 2009. URL: <http://fcm.biblio.unc.edu.ar/cgi-bin/koha/opac-detail.pl?biblionumber=18625>
4. Comisión Económica para América Latina y el Caribe Vulnerabilidad sociodemográfica: viejos y nuevos riesgos para comunidades, hogares y personas. Santiago de Chile, CEPAL, LC/R.2086. 2002. URL: <http://www.cepal.org/es/publications>
5. Organización Mundial de la Salud. Nota informativa N° 318. 2012. URL: <http://www.who.int/mediacentre/factsheets/fs318/es>
6. Espinosa – Zapata M, Loza G, Mondragón R. Prevalencia de lesiones de la mucosa bucal en pacientes pediátricos. Informe preliminar. *Cir Cir* 2006; 74:153-157.
7. Jiménez Palacios C, Villarroel Dorrego M, Pérez C, Bauce B, Córdoba M. (2013). Factores que influyen en la prevalencia de patologías bucales de tejidos blandos y duros de niños y

Socio-cultural and demographic characteristics detected in the study group reflect conditions of social, educational and health vulnerability, which interfere with subjects' inclusion in the productive system and their access to better living conditions. The clinical profile of youths in confinement showed marked prevalence of the very high level of severity of caries, gingival disease and malocclusion, but not initial stages of caries, enamel alterations and temporomandibular dysfunction. The DMFT and SiC indexes showed high severity in youths in our study, a situation which they do not recognize as harm or risk, there by generating a major difference between the reality measured and the self-image of these youths.

CORRESPONDENCE

Dra. Mgter. María Marcela Barnetche
Facultad de Odontología
Av. Haya de la Torre Universidad Nacional de Córdoba,
Ciudad Universitaria, 5000 Córdoba, Argentina.
marcebarnetche@gmail.com

- adolescentes. Revisión de la literatura. *Acta Odontológica Venez.* 2013; URL: <http://www.actaodontologica.com/ediciones/2013/1/art22.asp>.
8. Ourens M, Roger C, Hilgert J, Lorenzo S, Hugo FN, Álvarez R et al. Prevalencia de maloclusiones en adolescentes y adultos jóvenes del interior del Uruguay. *Relevamiento nacional de salud bucal 2010-2011. Odontostomatología* 2013; 15: 47-57. URL: http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S1688
9. Organización Mundial de la Salud. Encuestas de Salud Bucodental. Métodos Básicos. 4° Ed Ginebra; 1997. URL: <http://www.who.int/iris/handle/10665/41997>
10. Corsini G, Fuentes R, Bustos L, Borie E, Navarrete A, Navarrete D, et al. Determinación de los signos y síntomas de los trastornos temporomandibulares, en estudiantes de 13 a 18 años de un colegio de la Comuna de Temuco, Chile. *Int. J. Morphol* 2005; 23: 345-352. <http://www.scielo.cl/pdf/ijmorphol/v23n4/art10.pdf>
11. Castro Gutiérrez I, Pérez Muro Y, Bermúdez Paredes M, Fernández Serrano JM. Trastornos de la articulación temporomandibular en la población mayor de 18 años del municipio Trinidad 2010. *Gac Méd Espirit* 2015; 17:12-22. URL: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S1608-89212015000200002&lng=es
12. Di Rienzo JA, Casanoves F, Balzarini MG, Gonzalez L, et al. InfoStat versión 2010. Grupo InfoStat, FCA, Universidad Nacional de Córdoba, Argentina. URL: <http://www.infostat.com.ar>
13. Bordoni N, Escobar A, Castillo Mercado R. *Odontología Pediátrica. La salud bucal del niño y el adolescente en el mundo actual.* Buenos Aires, Argentina. Ed Panamericana, 2010:103-122.

14. Fang Y. Asymptotic equivalence between cross-validations and Akaike Information Criteria in mixed-effects models. *Journal of Data Science* 2011; 9: 15-21. URL: <http://www.jds-online.com/files/JDS-652a.pdf>.
15. Di Rienzo JA, Guzman TW, Casanoves F. A multiple comparisons methods based on the distribution of the root node distance of binary tree. *Journal of Agricultural, Biological and Environmental Statistic*. 2002; 7: 129-142. URL: <https://link.springer.com/article/10.1198/10857110260141193>.
16. Fernández Suarez A, Pérez Sánchez B, Fernández Alonso L, Herrero Olaizola J, Rodríguez Díaz FJ. Perfil de menores infractores extranjeros acompañados y no acompañados en Asturias. *Rev. De Psicología. Univ de Chile*. 2015; 24: 1-18. URL: <http://dx.doi.org/10.5354/0719-0581.2015.36911>
17. Amaya Bastarrachea A, Salgado Góngora A, Martínez Loeza J, Chablé de la Cruz S. Perfil familiar, sociodemográfico y demográfico de jóvenes de un tutelar de menores. *Rev. Electrónica de Psicología Iztacala* 2013; 16. URL: <http://www.revistas.unam.mx/index.php/rep>.
18. Sanabria AM, Uribe Rodríguez AF. Factores psicosociales de riesgo asociados a conductas problemáticas en jóvenes infractores y no infractores. *Rev Diversitas* 2010; 6: 257- 274. URL: <http://tuxchi.redalyc.org/articulo>.
19. Gigena PC. Salud bucodental de adolescentes y jóvenes drogodependientes y no consumidores de sustancias psicoactivas, en la Ciudad de Córdoba, Argentina. Facultad de Odontología. Universidad Nacional de Córdoba. 2013. URL: <http://hdl.handle.net/11086/1617>.
20. Varela O, De la iglesia M, Rojas Breu G, Caputo M. Estudio exploratorio sobre la génesis de los actos transgresores en jóvenes adolescentes de la provincia de Buenos Aires. 2013. URL: <https://www.aacademica.org/000-054/535.pdf>
21. Secretaría de Programación para la Prevención de la Drogadicción y la Lucha contra el Narcotráfico. (SEDRONAR). "El Uso Indevido de Sustancias y la Consulta de Emergencia. 2009. URL: <http://www.boletinoficial.gov.ar/DisplayPdf.aspx?s=04&f=20100215>.
22. Lucero MF. Representaciones sobre salud/enfermedad/atención construida por adolescentes de la Ciudad de Córdoba, Argentina. Facultad de Odontología. Universidad Nacional de Córdoba. 2013 URL:<http://odo.biblio.unc.edu.ar/cgi-bin/koha/opacdetail.pl?biblionumber=3364>.
23. Espinoza Santander I, Muñoz Poblete C, Lara Molina M, Uribe Cifuentes JP. Hábitos de Higiene Oral en Estudiantes de Odontología de la Universidad de Chile. *Rev. Clin. Periodoncia Implantol. Rehabíl. Oral* 2010; 3: 11-18. URL: [https://doi.org/10.1016/S0718-5391\(10\)70035-5](https://doi.org/10.1016/S0718-5391(10)70035-5)
24. Arhens Villar AN, Colmán Rodríguez RE, Martínez Ramírez NE, Morel Barrios MI, Osorio de Galli M, Paciello de Ayala MR. Actitud y práctica sobre salud bucal en adolescentes de colegios públicos de Asunción. *Rev. Salud Pública Parag* 2015; 5: 40-47. URL:<http://www.ins.gov.py/revistas/index.php/rssp/article/view/332/263>
25. Barriuso Lapresa L, Sanz Barbero B. Análisis multinivel del uso de servicios de salud bucodental por población infante-juvenil. *Gac Sanit* 2011; 25:391-396.
26. Fernández Vega LR, Barrueco Botiel LB, Díaz del Mazo L, Rosales Torres I, Barzaga Domínguez Y. Caries dental en adolescentes de una comunidad venezolana. *Medisan* 2014; 18:1070-1075.
27. Almerich Silla JM, Montiel Company JM. Encuesta sobre hábitos higiénicos orales en la población adolescente de la Comunidad Valenciana 2004. *RCOE* 2006; 11:195-201.
28. Riva R, Rotemberg E, Sanguinetti M, Rodríguez A, Massa F. Drogodependencia, Bruxismo y Trastornos Témporo-Mandibulares: Análisis comparativo en dos poblaciones: Muestra Nacional y población en tratamiento por consumo problemático de drogas en Portal Amarillo. *Odontoestomatología* 2014; 16: 26-33. URL:http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S1688-93392014000200005&lng=es
29. Gigena PC, Bella M, Barnetche MM, Verduci P, et.al. Situación de salud bucal de adolescentes de diferentes contextos de la Ciudad de Córdoba, Argentina. 2015. URL: <http://inf.ufrgs.br/clioa>
30. Barone A, Sbordone L, Ramaglia L. Craniomandibular disorders and orthodontic treatment need in children. *J. of Rehabilitation* 1997; 24: 2-7. URL: <http://dx.doi.org/10.1111/j.1365-2842.1997.tb00252.x>
31. DeBont, L. G.; Digkraaf, L. C. & Stegenga, B. Epidemiology and natural progression of articular temporomandibular disorders. *J. Oral. Surg. Oral Med. Oral Pathol. Oral Radiol and Endod* 1997; 83: 72-76
32. Romero Y. Las metas del milenio y el componente bucal de la salud. *Acta Odontol Venez* 2006; 44: 210- 215.
33. García-Cortés JO, Mejía-Cruz JA, Medina-Cerda E, Orozco-De la Torre G, Medina-Solís CE, Márquez-Rodríguez S, Navarrete-Hernández JJ, Islas-Granillo H. Experiencia, prevalencia, severidad, necesidades de tratamiento para caries dental e índice de cuidados en adolescentes y adultos jóvenes mexicanos. *Rev Invest Clín* 2014; 6: 505-511.
34. Gigena PC, Bella MI, Cornejo LS. Salud bucal y hábitos de consumo de sustancias psicoactivas en adolescentes y jóvenes drogodependientes en recuperación. *Odontoestomatología* 2012; 14: 49-59. URL: http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S1688-93392012000200006&lng=es.
35. Pedroso Ramos L, González Rodríguez S, Reyes Suárez VO. Anomalías estructurales del esmalte y afectación estética en escolares de 6-17 años de Cojimar. 2015. URL: <http://www.estomatologia2015.sld.cu/index.php/estomatologia/nov2015/paper/view/799/466>
36. Ourens, M; Abegg, Claidis; Alvarez, Ramón; Hugo, Fernando Neves; Lorenzo, Susana; Hilgert, Juliana Balbinot; Celeste, Roger Keller. Prevalencia de maloclusiones en adolescentes y adultos jóvenes del interior de Uruguay. *Relevamiento nacional de salud bucal 2010- 2011. Odontoestomatología* 2013; 15: 47- 57. http://www.scielo.edu.uy/scielo.php?script=sci_arttext&pid=S1688-93392013000200006&lng=es.
37. Medina-Solís C, Maupomé G, Pelcastre-Villafuerte B, Ávila-Burgos LA, Vallejos-Sánchez AA, Casanova-Rosado AJ. Desigualdades socioeconómicas en salud bucal: caries dental en niños de 6 a 12 años de edad. *Rev Invest Clín* 2006; 58:296-304.
38. Wynder EL, Stellman SD. Comparative epidemiology of tobacco related cancers. *Cancer Res* 1977; 37: 4608-4616.