

ORAL HEALTH CARE PRACTICES OF ADOLESCENTS FROM CORDOBA, ARGENTINA, IN THE COVID-19 SCENERY

Prácticas de cuidado de salud bucal de adolescentes de Córdoba, Argentina, en el escenario de COVID-19

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ABSTRACT

Background: The COVID-19 pandemic caused by the SARS-CoV-2 virus, and the measures adopted for its mitigation especially those aimed at preventive social isolation generated multiple changes in the daily dynamics of most people's lives. Recent research by UNICEF shows that the COVID-19 crisis has had a significant impact on the mental health of adolescents and young people in Latin America and the Caribbean. Although fortunately the changes were not always negative, it was found that a significant proportion of this group felt less motivated to carry out their usual activities. In this context, we can consider the possibility of changes in health care practices that may have a negative impact on the current and future oral health status of adolescents. **Aim:** To understand behaviors related to adolescent health care practices in the context of COVID-19.

Material and Methods: The study population consisted of 31 adolescents (10 males and 21 females), who attended for emergency (n=14) and orthodontic treatment control (n=17), at the Dentistry Service of the San Roque Hospital, in the city of Cordoba, Argentina, during the months of April and May 2021. During the pandemic, a self-administered survey was applied to identify oral health-related practices.

Results: The mean age of adolescents surveyed was 16.84 years and 29.03% had COVID-19. The reason for consultation of 47% of the participants was for emergency (pain), and 53% for an orthodontic check-up. Of the participants, 96.66% used a toothbrush, 29.03% used dental floss and 93.55% used toothpaste. During the pandemic, 33.33% of adolescents increased the frequency of brushing; 53.33% changed eating habits, 35% consumed more cariogenic foods; 19.35% started drinking alcohol; 26% could not continue their studies and 19.35% worked before and during the pandemic.

Conclusions: Although our results do not allow us to assert that the COVID-19 pandemic has produced substantial modifications in relation to oral health practices, they do show changes in habits that alert us to the need for different health promotion actions aimed at this age group.

Keywords: *Health Knowledge, Attitudes, practice; Oral health; Adolescent; COVID-19; Adolescent Health; Cross-Sectional Studies*

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RESUMEN

Introducción: La pandemia de COVID-19 producida por el virus SARS-CoV-2 y las medidas adoptadas para su mitigación, especialmente aquellas encaminadas al aislamiento social preventivo, generaron múltiples cambios en la dinámica cotidiana de la vida de la mayoría de las personas. Una reciente investigación realizada por UNICEF muestra que la crisis del COVID-19 ha tenido un importante impacto en la salud mental de las y los adolescentes y jóvenes de Latinoamérica y el Caribe. Aunque, afortunadamente, los cambios no son siempre en sentido negativo, sí se detectó que una importante proporción de este grupo se sintió menos motivada para realizar las actividades habituales. En ese marco de circunstancias, podemos considerar la posibilidad de que se produzcan cambios a nivel de las prácticas de cuidado de salud que impacten de manera negativa en la condición de salud bucal actual y futura de los adolescentes. **Objetivo:** Evaluar conocimientos, actitudes y prácticas de cuidado de salud bucal y cambios en prácticas de salud que podrían incidir en la salud bucal, en el contexto de COVID-19.

Material y métodos: La población de estudio estuvo constituida por 31 adolescentes (10 varones y 21 mujeres), que asistieron por urgencia (n=14) y por control de tratamiento de ortodoncia (n=17), al Servicio de Odontología del Hospital San Roque, de la Ciudad de Córdoba, Argentina, durante los meses de abril y mayo de 2021. Se aplicó una encuesta para identificar las prácticas relacionadas con la salud bucal durante la pandemia.

Resultados: La edad promedio de los adolescentes encuestados fue de 16,84 años y el 29,03 % tuvo COVID-19. El motivo de consulta del 47 % de los participantes fue por urgencia (dolor), y del 53% por control de ortodoncia. El 96,66% usa cepillo dental, el 29,03 % usa hilo dental y el 93,55 % utiliza pasta dental. Durante la pandemia, el 33,33 % de los adolescentes aumentó la frecuencia de cepillado; el 53,33 % modificó los hábitos alimentarios, el 35 % consumió más alimentos cariogénicos; el 19,35 % empezó el consumo de alcohol; el 26 % no pudo continuar con los estudios y el 19,35 % trabaja antes y durante la pandemia. No se observan diferencias significativas con registros anteriores previos al contexto de pandemia de COVID-19.

Conclusiones: Nuestros resultados, si bien no nos permiten aseverar que la pandemia de COVID-19 haya producido modificaciones sustanciales en relación a las prácticas de salud bucal, evidencian cambios en hábitos que alertan sobre la necesidad de distintas acciones de promoción de la salud dirigidas a este grupo etario.

Palabras clave: *Conocimientos, actitudes y práctica en salud; Salud bucal; Adolescente; COVID-19; Salud del adolescente; Estudios transversales*

INTRODUCTION

History and literature give an account of the multiple pandemics (smallpox, plague, yellow fever, cholera, influenza A) that humanity has suffered. The advance of scientific knowledge has allowed the development of vaccines and generated socio-sanitary conditions, which have contributed to control and prevent the resurgence of new outbreaks.¹

Recently, in an unexpected and abrupt manner, COVID-19 emerged, produced by the SARS-CoV-2 virus. The outbreak of COVID-19

generated an unprecedented global social and health situation due to the speed of its spread and the severity of its effects. “*Staying at home*” was one of the measures promoted by governments around the world to stop the pandemic, in addition to restricting trips abroad and any kind of contact with other potentially contagious people. In Argentina, preventive and mandatory social isolation (ASPO)² was ordered for the entire population in March 2020.

In the city of Córdoba, the measure was main-

tained until the end of June, when the “preventive and obligatory social distancing” (DSPO)³ was established, which allowed the movement of people in public spaces, but not crowds, while educational and recreational establishments remained closed. The measures adopted to mitigate the COVID-19 pandemic, aimed mainly at preventive social isolation, generated multiple changes in the daily dynamics of most people's lives. Coping with it exacted a heavy toll on individuals, families, communities and societies around the world. Daily lives were significantly transformed, economies went into recession, and many of the traditional social, economic, and public health networks came under unprecedented pressure.⁴

Isolation, imposed to minimize the danger associated with the coronavirus, also entailed a number of risks for adolescents. Recent research conducted by UNICEF⁵ shows that the COVID-19 crisis has had an impact on the mental health of adolescents and young people in Latin America and the Caribbean. Of 8,444 adolescents and young people aged 13-29 years in nine countries and territories in the region, 27% reported feeling anxiety and 15% depression in the last seven days.

Likewise, 46% reported having less motivation to perform activities they normally enjoyed and 36% felt less motivated to perform usual activities. In adolescence, some habits can contribute to feeling good and achieving a better health-related quality of life, such as physical activity, reduction of hours/screen time and adequate sleep and rest.⁶ In school-children in Cordoba, Argentina, physical activity and the use of outdoor neighborhood spaces were correlated with the health dimensions of autonomy and family life.⁷

A study⁸ with 12/13-year-old adolescents from the city of Cordoba, in relation to self-perce-

ived health, school performance and other health-related habits, shows that changes in daily life could affect various dimensions of their health-related quality of life. The same study observed that: an increase in school performance corresponded with a better score with respect to school environment; an improvement in the availability of the study place correlated inversely with feelings of social acceptance and positively with the dimension of relationship with parents and family life; an increase in hours of sleep and cell phone use was negatively associated with psychological well-being. Conversely, the more hours of cell phone use, the better they felt about social acceptance.⁸

On the other hand, Bella *et al.*,⁹ analyzing how undergraduate and graduate students of the Faculty of Dentistry of the National University of Cordoba, Argentina interpret the context of the COVID-19 pandemic, point out the effect of virtuality on daily life and the reconsideration of professional practice after the pandemic as outstanding categories. The same authors conclude that the flexibility and adaptive effort of these students makes possible the change imposed by the new context.

COVID-19 also influenced the oral health of the population. After a first stage in which care was limited to emergency dental care, teledentistry and care with mirrored equipment, from the end of 2020, most dentists resumed their full activity with scheduled shifts and triage.¹⁰ Under these circumstances, we consider the possibility of changes at the level of health care practices that impact the current and future oral health status of adolescents. The aim of the present work was to evaluate knowledge, attitudes and practices of oral health care and changes in health practices that could impact on oral health, in the context of COVID-19.

MATERIALS AND METHODS

A descriptive cross-sectional study was carried out on adolescents who attended the Provincial Institute of Dentistry in the city of Cordoba, Argentina, during the months of April and May 2021. The study group consisted of all the adolescent patients who requested clinical care and gave written consent to participate in the study. The public agency is located in the center of the capital city, providing care mostly to people who lack private health insurance.

To determine the level of knowledge, attitudes and practices of the young participants, the survey by Gupta *et al.*,¹¹ adapted to the context of application by Carletto *et al.*,¹² was applied. A dimension was added to the original survey in order to record possible changes in health practices that could have an impact on oral health during the COVID-19 context.

For its validation in the scope of application, the survey was analyzed by researchers, dental professionals and psychologists, in terms of interpretation, acceptance of questions and

linguistic forms, and was finally composed of 42 questions: 11 true/false, 13 multiple choice and 18 dichotomous questions distributed in five domains:

- 1) Demographic characteristics;
- 2) Knowledge of oral health;
- 3) Attitudes related to oral health;
- 4) Practices related to oral health;
- 5) Other practices related to integral health.

The study protocol was developed in accordance with the Regulations of the Council for International Organizations of Medical Sciences (CIOMS),¹³ which establish guidelines for the application of the principles of the Declaration of Helsinki, adopted by the World Medical Association in 1964 and modified in 1975, 1983 and 1989.¹⁴ It also had the approval of the Training Commission of the Provincial Institute of Dentistry considering the recommendations for dental care in the context of Covid-19, of the Ministry of Health of the Argentine Nation.¹⁵

All the adolescents who participated in the study expressed their agreement and presented informed consent signed by

Figure 1.

Frequency distribution of changes in comprehensive health related practices

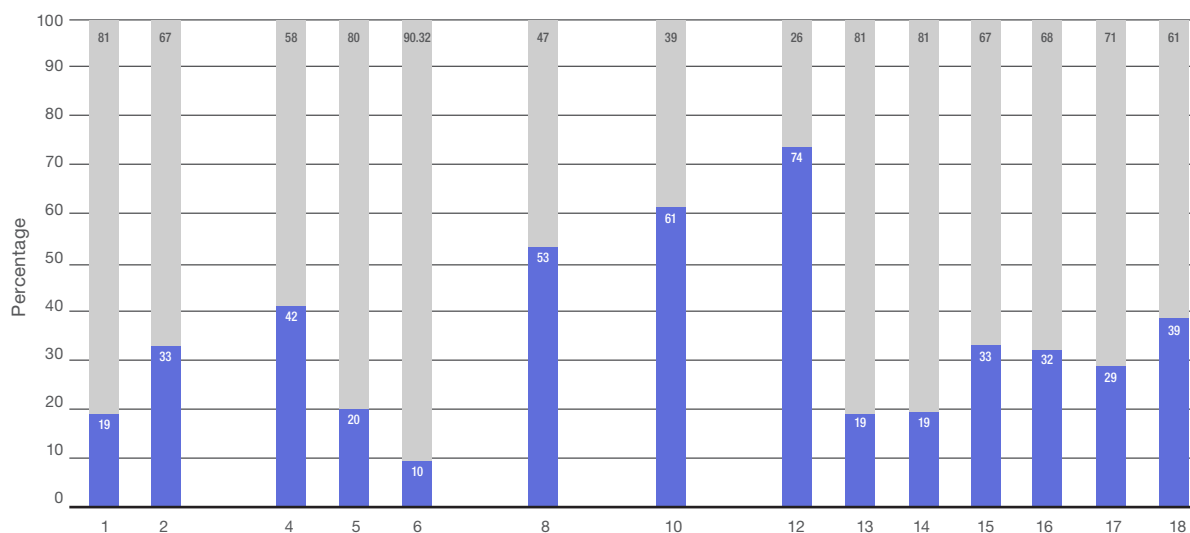


Table 1.

Demographic data of the adolescents under study (n=31)

Gender (%)		Education level* of mother (%)		Health System (%)	
Male	Female	Primary	Secondary	Public	Other
32.25	67.75	35	65	87.09	9.67

*: Each level of education comprises six years of study.

Table 2.

Knowledge related to oral health

Question	Correct answer (%)	Don't know/ No response (%)	Incorrect answer (%)
Bacteria on teeth cause cavities.	90.32	6.45	3.22
Natural teeth are better than false teeth.	80.64	6.45	12.90
Brushing your teeth can prevent cavities.	96.77	0.00	3.22
Eating and drinking sweet foods does not cause cavities.	70.96	3.22	25.80
You should visit the dentist at least once a year, even if you have no tooth problems or pain.	96.77	0.00	3.22
Flossing can prevent cavities.	48.38	22.58	29.03
Using fluoride prevents cavities.	48.38	41.93	9.67
Bleeding while brushing can be a sign of gum disease.	90.38	6.45	3.22
Gum disease can be caused by poor dental hygiene.	90.38	9.67	0.00
Brushing does not prevent gum problems.	58.07	16.12	25.80
Maintaining natural teeth is not as important.	74.19	3.22	22.59

Knowledge index 5.82±2.8

Table 3.

Attitudes related to oral health

Question	Answers (%)	Percentage (%)
How well do you think you take care of your teeth?	Very good	20.68
	Good	48.30
	Average	24.13
	Poor	6.89
My knowledge of gum disease is:	Very good	0.00
	Good	25.80
	Average	51.61
	Do not know	22.60
How important is it for you to clean your teeth?	Very important	58.10
	Important	38.70
	Not important	3.20
How important is it for you to have healthy oral conditions?	Very important	61.30
	Important	38.70
	Not important	0.00
What is the most important factor for the future of oral health?	My own endeavors	80.65
	Dentist	19.35

Attitude index 7.20±2.0

their parents or guardians. The survey was voluntary and anonymous, administered in person, in paper format, and prior to the clinical examination. The relative frequencies of the responses expressed as a percentage were determined. The general level of knowledge, attitudes and practices were calculated by applying the knowledge, attitude and practice indexes.¹²

RESULTS

The study group consisted of 31 adolescents aged 14 to 21 years. Adolescents up to 21

years of age were included in adherence to authors who contemplate late adolescence.¹⁶

The average age of the participants was 16.84 years. The analysis of the sociodemographic characteristics of the study group (Table 1), shows that females represent more than half of the adolescent participants.

Likewise, in relation to the educational level of the mother, more than half indicated having completed secondary school. Regarding the health care system, the majority (87.09%) of the respondents answered that they used the public system and a very small proportion

Table 4.

Practices related to oral health

Question	Answers (%)	Percentage (%)
Do you use a toothbrush?	Yes	96.66
	No	3.22
Do you use dental floss?	Yes	29.03
	No	70.96
Do you use toothpaste?	Yes	70.96
	No	29.03
What kind of toothpaste do you use?	Fluorinated	35.48
	Nonfluorine	29.03
	I don't know	35.48
How long do you brush your teeth?	Less than 3 minutes	51.72
	More than 3 minutes	48.28
At what time of the day do you brush your teeth?	When you get up, after lunch and snack and before going to bed	33.33
	When you get up and before going to bed	37.51
	Before going to bed	8.33
	After lunch and after dinner	8.33
How often do you change the toothbrush?	1 to 3 months	36.66
	4 to 6 months	30.02
	7 to 12 months	13.33
	After one year	3.33
	I don't know	16.66
What brushing technique do you use?	Horizontal movements (side to side)	45.16
	Up and down movements	32.26
	Both	16.13
	I do not apply any technique	6.45

Practice index: 5.90± 1.91

Table 5.

Changes in practices related to comprehensive health

Question	Answers (%)	Percentage (%)
1. During the pandemic, did you change your oral hygiene habits?	Yes	19.35
	No	80.65
2. During the pandemic, did you increase the frequency of brushing?	Yes	33.33
	No	66.66
3. Did you brush your teeth?	1 (once) a day	19.35
	2 or + times a day	77.41
	Don't know/No answer	3.24
4. Did you change the times you brushed your teeth?	Yes	41.94
	No	58.06
5. During the pandemic, did you use dental floss (N=30)?	Yes	20
	No	80
6. Did you use any mouthwash?	Yes	9.68
	No	90.32
7. Time of brushing duration (N=29)	Less than 3 minutes	48.25
	More than 3 minutes	45.16
	Don't know/No answer	6.45
8. During the pandemic, did you change your eating habits?	Yes	53.33
	No	46.66
9. During the pandemic, did you consume more: (N=28)	Candies	45.16
	Pasta	77.42
	Meats	64.51
	Vegetables	51.61
	Fruits	45.16
	Sweetened beverages	54.84
	Bakery products	61.29
10. During the pandemic, did you gain weight?	Yes	61.30
	No	38.70
11. During the pandemic, did you start or increase your consumption of: (9 participants responded)	Cigarettes	9.68
	Alcohol	19.35
12. During the pandemic, were you able to continue your studies?	Yes	74.20
	No	25.80
13. Did you start any other studies?	Yes	19.35
	No	80.65
14. Were you employed before the pandemic?	Yes	19.35
	No	80.65
15. Were you able to continue your work during the pandemic (N=22)*	Yes	33.33
	No	66.66
16. Did you need to find a job?	Yes	32.25
	No	58.06
	Don't know/No answer	9.68
17. Did you have COVID-19?	Yes	29.03
	No	70.96
18. Did anyone in your family have COVID-19?	Yes	38.70
	No	61.30

*Only 22 teenagers were working before the pandemic

answered that they had used private health care systems.

The knowledge about oral health expressed by the adolescents (Table 2), shows that most of them recognize that bacteria cause caries, that brushing teeth is useful as a preventive factor and that gum disease (gingivitis) could occur due to poor dental hygiene.

Regarding the attitudes of adolescents in relation to oral health (Table 3), 68.98% expressed taking very good/good care of their teeth and 51.61% considered having regular knowledge about gum disease. Likewise, 96.8% of the respondents stated that it was important/very important to clean their teeth and all indicated that it was very important to have good oral health.

Finally, the vast majority of the participating adolescents prioritize their own efforts to maintain good oral health. In relation to oral health practices (Table 4), the largest proportion of respondents reported that they brush their teeth with water and toothpaste. Approximately half of them do so for less than three minutes with horizontal movements. Only one third brushed when getting up and before going to bed, with a similar proportion brushing when getting up, after lunch and snack, and before going to bed. More than half of the young people (66.68%) reported that they renew their toothbrush between 1 and 6 months of use.

The mean values of the indices of “*knowledge*”, “*attitudes*” and “*practices*” resulted: 5.82 ± 2.8 ; 7.20 ± 2.0 and 5.90 ± 1.91 respectively. In relation to changes in practices related to integral health, not all participants answered all items, modifying their N as indicated in Table 5. Most of the respondents (80.65 %) did not recognize changes in their oral hygiene practices during the pandemic, al-

though 33.33% reported having increased the frequency of brushing.

They do express modifications in practices related to their eating habits. Among the latter, the consumption of pasta and bakery products occupies a preponderant place. Of the adolescents, 35.71% consumed sweets, sweetened beverages and bakery products together.

In relation to other integral health practices, during the pandemic, weight gain, alcohol consumption and cigarette smoking are highlighted. Most of the respondents were able to continue with their studies and/or start other studies. Meanwhile, more than half of the adolescents who were working before the pandemic were not able to keep their jobs.

Figure 1 reveals that the variation in specific oral health practices is lower in relation to variations that took place in the context of the pandemic in practices that have an indirect impact on oral health but that affect the overall health of the adolescents under study, and consequently, their quality of life. The numbering of the bars corresponds to the categories shown in Table 5. The red bars correspond to healthy changes and the gray bars to unhealthy changes.

DISCUSSION

The results of our study suggest that the participating adolescents have a level of knowledge similar to that observed in other studies carried out in the region,^{17,18} although the knowledge index is slightly lower than that determined by our research team in a study carried out prior to the pandemic in the same health care center.¹²

Of note in the present study is the high

percentage of young people who recognize that brushing their teeth can prevent caries and the importance of visiting the dentist at least once a year, even in the absence of tooth problems or pain.

However, very few recognize the preventive value of the use of fluoride and dental floss, data that are in agreement with those observed in adolescents in Abha, Saudi Arabia.¹⁹ Although gingivitis is the most frequently observed type of periodontal disease in young people, only 58.07% of the respondents recognize the preventive value of toothbrushing for periodontal diseases.

These results are in line with those found in other studies.²⁰ The attitudes and practices of the adolescents are in line with the knowledge about oral health expressed by them and present values similar to those found in a study carried out by our research team before the pandemic.¹²

The great majority of them recognize their own efforts as the most important factor for the maintenance of their oral health; however, only half of them consider that they take good care of their teeth and that their knowledge about gum disease is insufficient. On the other hand, in relation to oral health practices, 70.96% of the respondents affirmed that they use toothpaste for brushing, but as in our previous study, 35.48% did not know if their toothpaste contained fluoride, so it follows that they are unaware of the preventive role of fluoride, ratifying what was expressed in the knowledge survey.

Analyzing the responses on practices, it could be inferred that knowledge about the value of healthy practices is scarce. It is not enough to know about the importance of

toothbrushing, but it is also important to know the moment, the time, the technique applied and the use of tooth-paste with or without fluoride, among other aspects.

In relation to changes in healthy practices during the pandemic, the young people participating in the study have not improved their oral hygiene while at the same time they have increased unhealthy habits that have a negative impact on general health and oral health in particular, such as the consumption of alcohol, cigarettes and cariogenic foods.

On the other hand, the increased consumption of pasta, sweets, sugary drinks and bakery products is directly related to weight gain. Other aspects such as continuity in study and work affect people's overall health; in our study context, strategies were implemented that allowed most of the young people to continue with their studies.⁹ For its part, the reduction of economic activity during the pandemic affected the sources of work and consequently the permanence in the jobs of the youngest. However, in these exceptional circumstances, Argentine adolescents reported good capacity to organize their own routine and very good or good coexistence in their homes.⁹

Oral health as part of the integral health of people is of high incidence in their quality of life. It is during adolescence that healthy or unfavorable health behaviors are modeled, so it is essential at this stage of life to try to strengthen responsibility in self-care and adherence to good health practices.²¹

Information on knowledge, attitudes and practices in relation to oral health and the possible incidence of the COVID-19 context is very important for the design of strategies for oral health promotion, prevention and

care that consider the particular needs and characteristics of the target population.²²

It is important to point out that the data obtained in this study come from subjects who attended a provincial public dental center in a pandemic context, in a specific period of time, and were seen for presenting an oral pathology or for orthodontic treatment control, so they would not be representative of the adolescent population of Cordoba.

Likewise, it is important to point out that given the size of the population under study we cannot discriminate the weight of each of the factors studied.

CONCLUSIONS

It is clear that it is important to raise awareness among adolescents in order to take care of their teeth and to maximize oral hygiene measures. It is necessary to design, with the participation of the target group, educational strategies for the promotion of oral health, in which the contents are organized according to the interests and characteristics of the target group, focusing on habits, customs and knowledge related to oral health, specifically directed towards nutrition, hygiene and unhealthy habits.

The promotion strategies should also include knowledge about the risks associated with negative lifestyles for the health of the members of this population group and their environment.

CONFLICT OF INTERESTS

The authors have no conflicts of interest.

ETHICS APPROVAL

All adolescents who participated in the study expressed their agreement and presented informed consent signed by their parents or guardians.

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AUTHORS' CONTRIBUTIONS

Lila Susana Cornejo: Conceptualization, design of the pandemic-related questionnaire and overall article design; Formal analysis; Writing – original draft: development of the article's discussion and overall writing.

Carolina Isla: Investigation: participant enrollment; Data curation: creation and management of the database.

Fabiana Carletto-Körber: Conceptualization: article design; Formal analysis; Writing – review and editing.

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PEER REVIEW

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