



## Educational Actions for Oral Health in Patients with Manifestations Secondary to Chemotherapy Treatments

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### Abstract

**Background:** health education is the combination of actions designed to teach how to control determinants of health.

**Objective:** to propose a system of educational actions to raise information on oral health in patients with manifestations secondary to chemotherapy.

**Methodology:** an educational intervention study was conducted in the period from September 2019 to February 2022. The population consisted of 80 patients with oral manifestations secondary to chemotherapy, belonging to the Oncology service of the Provincial General Hospital of Sancti Spiritus, the sample was made up of 67 patients, for its selection a simple random probability sampling was used. Theoretical, empirical and statistical-mathematical methods were used. The variables studied were age, sex, oral manifestations and level of information on oral manifestations secondary to chemotherapy.

**Results:** in the initial diagnosis it was found that half of the patients had a regular level of information on oral manifestations secondary to chemotherapy in 41.7%. Based on the results of the diagnosis and the theoretical foundations, a system of actions was designed that was characterized by being integral, flexible, intentional and participatory. The experts assessed as quite adequate, the relevance of the system of educational actions. By partially implementing the system of actions, patients demonstrated a level of good information about oral manifestations secondary to chemotherapy.

**Conclusions:** when partially applying the system of educational actions, a favorable variation of the information was achieved in patients with oral manifestations secondary to chemotherapy.

**Keywords:** Oral Manifestations; Chemotherapy; Educational Actions; Level of Information

### Introduction

Quality of life is a significant issue today, for the same fact that over the years, it is not improving, especially if we talk about those people who have a chronic disease such as cancer [1].

Cancer defined according to the World Health Organization (WHO), is a process of uncontrolled growth and dissemination of cells, second cause of death in the world, after cardiovascular

diseases, causing 8.7 million deaths [2]. It has been considered as the disease of the XXI century, that because currently the cases that are reported annually continue to increase [3].

More than 70% of all cancer deaths occur in low- and middle-income countries, where resources for prevention, diagnosis and treatment of the disease are limited or non-existent [4].

Cancer is part of the set of high-cost diseases that have economic, social and emotional implications [5]. Despite advances in various fields of oncology, cancer treatment continues to be based primarily on the administration of chemotherapy with or without radiotherapy and surgery, [6]. which produce side effects in different organs and systems, including the oral cavity [5].

Chemotherapy consists of administering drugs that affect certain cell populations in specific phases of the cell cycle, looking for the death of tumor cells and affecting healthy cells that coincide with that phase [7]. It is the first-choice treatment for many types of cancer and is almost always used as a systemic treatment. More than 100 chemotherapy drugs are currently used in cancer treatment, either alone or in combination with other drugs or treatments [8]. It is used to treat approximately 70% of cancer patients, of these patients, 40% develop oral manifestations [9].

The condition of the oral cavity is one of the most frequent side effects of chemo-radiotherapy and one of those that causes greater discomfort to the patient. It alters fundamental functions such as phonation, feeding, swallowing and is also accompanied by pain, so the prevention and control of oral complications can help you continue with cancer treatment and have a better quality of life [10]. Mucositis, one of the most frequent side effects of chemotherapy, alteration of salivary flow, superinfection of oral lesions and the possibility of gingival hemorrhages are also common; later trismus, osteoradionecrosis and dysphagia may also appear [11].

International studies confirm the presence of oral manifestations as a result of chemotherapy treatment. The results obtained by Condori Escobar [12]. prove that dysgeusia was the most representative oral alteration; while the research carried out by Castillo Borja AZ., shows that the most frequent pathology is oral mucositis [13].

Studies conducted at the Metropolitan University of Barranquilla, Colombia show multiple symptomatic effects during and after stomatological treatments, which trigger in the patient a significant acute state of discomfort and disability, such as oral mucositis (mb) in its different stages, trismus, dysphagia and xerostomia [14].

In Cuba, cancer is a health problem for the population with increasing mortality levels predominantly related to the aging

population taking place in the country. It is the leading cause of premature mortality in Cuba [14].

In the province of Sancti Spiritus cancer continues to be the leading cause of death, every year around 1000 countrymen die from this pathology [15].

There is now a need to increase the level of information on cancer for the creation and implementation of public health programs that inform about its prevention, early detection and timely treatment as key tools to counteract its morbidity and mortality statistics. It is important to raise awareness about self-examination and attendance at periodic oral evaluations that contribute to early diagnosis this allows the patient to seek appropriate treatment in the early stages of the disease, which would improve their prognosis [16].

Information about how to contribute to health can come from different avenues, from family members to health promotion and education programmes of different services and the mass media [16].

Increasing the level of information does not ensure behavioral change, but numerous studies show a positive association between the level of information and behavior. Health information is necessary before the patient makes the decision to take action regarding their health [17].

In research conducted by Nicot Navarro AM., *et al.*, they observed that in general, the level of information related to oral cancer and its possible consequences is the starting point if you want to gain in risk perception that at the same time is the first step to modify harmful behaviors [17].

The World Health Organization (WHO), in the context of the Ottawa Charter, highlights the importance of Health Education (HSE) as a form of transformation of the human being, which should occur with the commitment of the education and health sector when applying methodologies to inform and educate about healthier attitudes and ways of life [18].

Health education aims to transmit knowledge that motivates and enhances knowledge and know-how. It must ensure that people are aware of, analyse the social, economic and environmental

causes that negatively influence health; to develop skills that lead to a situation where people: want to live healthy, know how to achieve health, do what is necessary, individually and collectively, to maintain health, and seek help when they need it [19].

Despite the existence of educational actions to contribute to the education for oral health of the population, in the literature consulted there are few referring to patients with oral manifestations secondary to chemotherapy treatments that help them improve their information; there is also a large influx of patients who come to consultations, after presenting obvious oral manifestations related to the application of chemotherapy treatments, which is considered a problematic situation to investigate.

It is considered convenient the need to develop a system of educational actions that includes this type of patient, based mainly on educational-participatory techniques specific to this group, which stimulates and encourages their participation and appropriate information that leads to changes in their oral health.

## Material and Method

An educational intervention study was conducted in the period from September 2019 to February 2022, at the Camilo Cienfuegos Provincial General Hospital in Sancti Spíritus.

The population consisted of 80 patients with oral manifestations secondary to chemotherapy, belonging to the Oncology service of the Provincial General Hospital of Sancti Spíritus. The sample consisted of 67 patients.

The postulates of ethics were respected, by which patients were explained the objective of the research, that the information obtained would not be used for other purposes outside the framework of the research, their participation would be voluntary and that they would have the possibility of abandoning it if they so decided. Their willingness to collaborate with the research was reflected in an informed consent form, signed by them.

## Methods

Research methods of the theoretical level were used: historical-logical, analytical-synthetic and inductive-deductive, systemic approach method. From the empirical: observation, survey and the criterion of experts. In addition the statistical-mathematician.

## Procedures and techniques for collecting information

### Stages of the investigation

#### First stage

Coordination and diagnosis stage: to carry out this research; the subject under study was first communicated to the scientific council and the Ethics Committee of the Provincial General Hospital of Sancti Spíritus. It is a stage of characterization of people and their environment, determination of the current state of health education related to oral manifestations secondary to chemotherapy, patients studied were provided with detailed information about the characteristics of the research and informed consent and willingness to collaborate in the activities were requested. To perform the observation, the patient was placed in front of a window using natural light, the classification set was used to perform the oral examination, the place where they worked was in the consultation where they receive chemotherapy treatment at the General Hospital of Sancti Spíritus. The data were captured in an observation guide. In addition, a survey was conducted to identify the level of information on manifestations secondary to chemotherapy treatment.

#### Second stage

Design stage of the system of educational actions: once the previous stage was completed and in correspondence with the initial diagnosis, the system of educational actions was designed.'

The method of expert criteria was used to obtain a consensus for the relevance of the system of educational actions, according to T. Crespo [20].

The selection of the experts was made based on the self-assessment and assessment made by each of the professionals on the competence in the subject and the sources that argue such level of competence. They were considered as such professionals (doctors and stomatologists) related to teaching and the subject being treated and in turn, who had, at least, one of the following requirements

- Specialist of II Degree of Integral General Stomatology
- Oncology Specialist
- Teacher with higher category
- Master
- Doctor of Science

Each of the experts' evaluations was analyzed and the suggestions issued about the relevance of the proposed system of educational actions were taken into account.

**Third stage**

Partial application stage: three educational actions were applied (action 1, 2 and 3) of the system of actions designed to contribute to favorably raise the level of information on oral manifestations secondary to chemotherapy, for which 20 patients were intentionally selected from the sample under study.

For the evaluation of the educational actions applied, the qualitative technique was used focus group, 20 patients were selected, divided into groups of 10 participants each, taking into account as main criterion the presence of these patients in the chemotherapy consultation.

The focus group allowed the interaction of the participants through the conversation about the research topic, provided balance and reliability in the data and also increased the confidence of the participants to express their opinions, through which information is obtained about what people think and do, exploring the whys and hows of their opinions and actions. For the development of this technique, the author prepared a guide of questions for conducting the session.

Patients were informed of the development of the activity, in visits made to the consultation where they received chemotherapy treatment, belonging to the Oncology service of the Provincial General Hospital. The session lasted approximately one hour and comprised three moments

- **Welcome:** The medical staff and the institution to which they belonged were introduced.
- **Technical framing:** It was reported that the topic of the session was related to oral manifestations secondary to chemotherapy with the purpose of raising the level of information. The lines of work were established from the beginning to guarantee the confidentiality of the information, the good mutual treatment and the comfort of the environment.
- **Farewell:** Patients were thanked for their participation and questioned about how they felt during the session.

The analysis of the results obtained was carried out qualitatively, through the technique of content analysis that involves coding the information and scientific interpretations on the orientation of the answers of the interviewees; with emphasis on the comments, the duration of these, the questions that generated more or less interest.

The following variables were measured: sex (male/female) and age of patients (25-59 years/60-64 years/65 and more), oral manifestations secondary to chemotherapy are classified as.

Mucositis, Xerostomia, Infections, Hemorrhages, Pain and Dysgeusia, level of information on oral manifestations secondary to chemotherapy according to the survey rating of information level is: [Good (24-33 points), Fair (16-23 points) and Poor (0-15 points)].

**Results**

As can be seen in table 1 there is a predominance of women, represented by 55.2%, the most representative age group was that of 60-64 with 50.7%

Age Range	Patients	%
25-59	18	26,9
60-64	34	50,7
65 and over	15	22,3
Sex		
Male	30	44,7
Female	37	55,2
Total	67	100

**Table 1:** Sociodemographic characterization.

In the present research there is a predominance of the female sex, results that are similar to those reported by Padilla Arteaga, where the female sex also predominated [21].

The results differ from those presented in the study of Dr. Chuchuca Guazhco [22] in Guayaquil, Ecuador, where the male sex predominated. It also disagrees with the results obtained by Ramos Francisco YM., *et al.* [23]. where 65,2% were male.

It also does not agree with the study conducted by García Chías BE, [24] where no statistically significant differences were found regarding the sex of the patients.

As for the most representative age group, it was 60-64 years of age. The results of the research differ with those obtained by Velten DB [25], in which the predominant age group was the group of 25-59 years of age.

It is the author’s opinion that the gender difference can be an element that speaks in favor of the predominance of the female sex, also attributing to traditional factors that show that women are more concerned and with greater interest in the appropriation of knowledge.

As can be seen in table 2 of a total of 67 patients with oral manifestations secondary to chemotherapy, dysgeusia was present in 100% of patients, followed by xerostomia with 83.5%, and continuing with oral mucositis with 82%.

Oral Manifestations	Patients	%
Oral mucositis	55	82
Xerostomia	56	83,5
Infections	26	38,8
Haemorrhage	19	28,3
Pain	39	58,2
Dysgeusia	67	100

**Table 2:** Oral manifestations secondary to chemotherapy.

Previous research showed that oral manifestations in patients with oncological therapy develop pathologies such as oral mucositis, alterations of salivary flow in its different degrees, the presence of a large percentage of dysgeusia, hemorrhages, infections and pain. These variations caused by cancer treatments can be influenced in the case of chemotherapy, by the wide variety of drugs that are applied to patients [2]. Triggering a significant acute state of discomfort and incapacity [8].

The present research coincides with studies conducted by Salcedo Hidalgo, where the most frequent manifestation was dysgeusia [26]. They also correspond to the results obtained by Lévano Villanueva C, (27) where the highest percentage of his patients had dysgeusia.

The results were similar to those reported by Padilla Arteaga, [21] with mucositis, dysgeusia and salivary flow variation being the most frequent manifestations found in his study.

They are also similar to those exposed by Vera Álvarez ME, [28] in her study that 89.5% presented some type of oral manifestation and at the end of the study the most frequent conditions were dysgeusia (73.7%), followed by mucositis and salivary flow variation with 47.4%.

Not coinciding with Castillo Borja AZ, [13] where he shows that the most frequent pathology is oral mucositis.

It is the author’s opinion that the high prevalence of dysgeusia is found in 100% of patients, since all reported clinical consequences of chemotherapy such as metallic taste in the oral cavity, variable tolerance of sweet, this being the main cause of aversion to food that leads to malnutrition and decreased quality of life. In addition, the condition has been attributed to physiological changes in the body, medications and cancer treatments.

Table 3 shows the level of information presented by patients on oral manifestations secondary to chemotherapy, where 41.7% of patients had a regular level of information on the subject.

Information Level	Well		Regular	
	No	%	No	%
Patients	39	58.2	28	41.7

**Table 3:** Level of information presented by patients on oral manifestations secondary to chemotherapy.

An international study [29] reports the appropriate level of information on stomatological treatments in this type of patient, but does not refer to oral manifestations secondary to chemotherapy.

Results presented by González Crespo [30] refer to a low level of information on this topic, so it does not coincide with those presented in this research.

They differ from those exposed in a study conducted by Taibi R., *et al.*, where 100% of the population were well informed [31]. They are also different from those of Ordóñez Daza DE., *et al.*, represented by 96.2% [32].

The Regular level of almost half of the patients surveyed shows the gaps they have on this subject. The author considers that the results are due to a lack of knowledge about the self-care measures that must be maintained during chemotherapy treatment, in

addition they do not take into account the risk factors that predispose to suffer from the disease, taking into account that the effects of chemotherapy in the oral cavity can be serious. Identifying these deficiencies in the level of information on oral manifestations secondary to chemotherapy, allows the development of educational actions in order to provide information, confidence, serenity and security in cancer patients.

**Proposal of the system of educational actions**

The term system has multiple definitions. Here are some of them

- “Set of elements that are closely related to each other, that keep the system directly or indirectly united in a more or less stable way and whose overall behavior pursues, usually an objective.” (Marcelo Arnold and F. Osorio, 2003)
- “A set of entities characterized by certain attributes that have relationships with each other and are located in a certain environment according to an objective criterion... relationships determine the natural association between two or more entities or between their attributes” (Juana Rincón, 1998)
- “Set of interacting elements. Interaction means that any element will behave differently if it relates to a different element within the same system. If behaviors do not differ, there is no interaction and therefore there is no system” (Pablo Cazau, 2003)
- “Set of real or imaginary elements differentiated, no matter by what means of the existing world. This assembly shall be a system if
  - The links between these elements are given.
  - Each of the elements within the system is indivisible.
  - The system interacts as a whole with the world outside the system. (L.H. Blumenfeld, 1960).

“A certain integral totality which has as its foundation certain laws of existence... The system is made up of elements that are related to each other.” (Zhamin, V.A, 1979).

“Delimited set of components, interrelated that constitute an integral formation”. (Julio Leyva, 1999).

“Structured set of elements regularly interrelated with each other, which are ordered following a certain law or principle, and which act as an entity of their own whose characteristics become the synthesis of the interrelation of the constituent elements, modifiable by subtracting any of them from the system”. (Cabrera, 2000).

The system approach in its current form, conditioned by the peculiarities of the scientific-technical revolution, uses in all its fullness the wealth of ideas, principles and concrete procedures of investigation of the real systems of reality and integrates more and more the advances that occur in cybernetics and computing. Therefore, it is not easy to synthesize all the volume of knowledge that has been accumulated in this field. In this sense, it is important to point out that in system research two sufficiently specialized areas have been differentiated: theoretical-methodological and applied.

The system that is proposed as a scientific result is formed by educational actions; defined by several authors, all of great significance in health education. The author assumes by the one defined by Cedeño MC,<sup>(33)</sup> where the system is a set of interrelated components, from the static and dynamic point of view, whose operation is aimed at achieving a certain objective.

A system of educational actions in health is a proposal of teaching-learning process, whose organized practice, with flexibility for educators and learners, takes into account for its application creativity, ethics, human values, target groups, themes and scenarios in a given time, as is typical of health education [34].

Educational actions are an effective strategy to modify knowledge and behaviors in patients who have difficulties or low level of learning when intervening in a general and group way. Although, it has the disadvantage that it requires more time, dedication, effort, empathy and tolerance on the part of the person responsible for its execution. Hence the importance of the teaching role played by the stomatologist who carries out a series of educational actions aimed at favoring the self-care of patients and with this measure to reduce post-chemotherapy complications, hospitalizations, delay in the

treatment scheme, the economic expenditure of health institutions, as well as to improve the biopsychosocial-spiritual aspect that is generated in the patient and contribute to the improvement of their quality of life [34].

There is a wide variety of systems and a wide range of typologies to classify them. The system of educational actions designed that are classified according to their basic characteristics and their constitution in abstract systems; And by their nature they are open systems because it takes into account the exchange relations of the object with the environment, through inputs and outputs of influences [35].

The author assumes the position of Zamora Corrales R., *et al*, [35] which states that the system of educational actions is a set of educational activities well structured with their relationships to achieve a general objective, needs a purpose, with a logical sequence and a dependence on each other, with flexibility for educators and learners, takes into account for its application creativity, ethics, human values, target groups, themes and scenarios in a given time, which establishes an interaction between all forming a single whole, as is typical of health education.

The author assumes this definition of system referred to educational actions, since by their organic nature they are considered as the totality of the proposed system, which is formed by components and structural relationships that determine its organization and its functions about health education in the oral manifestations secondary to chemotherapy treatment.

## System of Educational Actions

### Action 1: Presentation and guidance

- Objective: To present the educational proposal, as well as to promote the presentation and motivation of each of the members of the group.

#### Procedures

- Presentation of the coordinator to the group
- Explanation of the reason for their presence

Make a brief introduction about the system of educational actions and invite each of the members of the group to their presentation. The participatory technique is suggested: "Towns and Cities" proposed by Yadira Bautista Ortiz [36].

In this technique the facilitator will give each participant a strip of paper with the name of a town or city. Later he will indicate to the participants that they must find their partner, who owns a strip of paper with the same city or town. Once the couple is found, they must present themselves answering the following questions: Who are you? What are you up to? Why did you come to this workshop? Who am I? What should I do? Why did I come to this workshop? To end the activity, couples must introduce each other to the rest of the group.

Spontaneously, participants should report how they have felt.

### Action 2: Educational talk. Topic: Chemotherapy. Concept and most frequent secondary oral manifestations.

- Objective: To define the concept of chemotherapy, what it consists of and what are the most frequent secondary oral manifestations.
- Ways to proceed: It begins by carrying out the educational talk with the help of the participatory technique: brainstorming, the name of the concept that they are going to define is placed on the blackboard and the ideas expressed by the patients are written below and from there determine the essential characteristics that distinguish the concept and then accurately state the essential features of the concept.

#### Evaluation and Control

The participatory technique "The magic carpet" proposed by Miriam López Domínguez is suggested [36].

- **Objective:** To evaluate the level of information acquired by the participants during the session.
- **Materials:** Sheets, adhesive tape and markers.
- Development
  - The facilitator will ask the group to join the sheets of paper together with adhesive tape, until they form a rectangle.
  - To evaluate the session, instruct the participants to write their learning and observations on the carpet that they all built.

- It is suggested to ask some questions to guide them, for example: what did they learn?, What was the most important thing about the session?
- Once the participants have finished, provide an overall conclusion of the entire session and rescue the most important comments from the “magic carpet”.
- Recommendations
  - During this activity it is important to pay attention to the comments and suggestions of the participants, as this will allow to recognize if the objectives are being well addressed and adapt strategies in the direction that the formation of the group is taking.

**Action 3: Participatory educational techniques. Topic: Self-care measures on oral manifestations secondary to chemotherapy.**

- **Objectives:** To know by patients what are the measures of self-care that they should know before the secondary oral manifestations of chemotherapy.
- Encourage the willingness of patients to continue deepening self-care measures towards oral manifestations secondary to chemotherapy.
- **Ways to proceed:** The facilitator through illustrative banners refers to the self-care measures that must be known to avoid aggravating the effects or oral manifestations secondary to chemotherapy.
- In addition, the technique of “the fish tank” proposed by Rosa Elena Márquez Rosas is proposed [36].
- **Objective:** To encourage group discussion in the reflection of the contents developed during the session.
- **Materials:** No material is required to perform this activity.
- **Development:**
  - The facilitator will divide the group into two teams, one of them will meet in their chairs towards the left side of the room and will be placed in a semicircular way to talk about the topic developed during the session.
  - While the other team will meet towards the right side of the room and will be placed in a semicircular way, the participants of this circle will only listen to what is said by the members who are on the left side of the room.

- To conclude the activity, the whole group reconvenes in a circle to reflect on the discussion that arose in the fish tank.

**Evaluation and Control**

The participatory technique “Fears and hopes” by Osvaldo Pérez González is proposed [36].

- **Objective:** To make the group aware of their motivations, desires and hopes, anxieties and fears.
- **Materials:** A blank sheet of paper and pen. Chalkboard or a large cardboard.

**Development**

- The animator begins by saying that surely everyone has, regarding the treatment, fears and hopes. In the exercise they will do, everyone will be able to express those fears and hopes.
- It will form subgroups of five to seven members each.
- Then distribute a blank sheet to each subgroup, which will appoint a secretary to record the fears and hopes of the team.
- Continuing, the animator will ask each subgroup to express their fears and hopes regarding the oral manifestations of the treatment in the sheet that was given to them, using about seven minutes.
- After the time, the larger group is formed again, so that each group can communicate what was noted.
- The animator will summarize on the board or card and observe that the fears and hopes of the subgroups are probably identical and are reduced to two or three.
- The exercise can continue in this way: the animator asks that the subgroups be formed again, and each one will study more in depth one of the fears or one of the hopes of the group, its characteristics, its manifestations, etc. At the end, again in the large group, one of the members of each subgroup must personalize in mimicry the fear or hope that has been studied in the subgroup. In other words, you must experience and make others feel that fear or hope.

**Action 4 Demonstration of toothbrushing technique**

**Objective:** To demonstrate the correct technique of toothbrushing as an effective method in the prevention of oral manifestations secondary to chemotherapy treatment.



### Ways to proceed

- Patients are demonstrated through a typodon and tooth brush the technique of tooth brushing and the proper use of auxiliary means of interdental cleaning.

### Evaluation and Control

- The group is divided into pairs and each one is given a tablet of Plac-Dent in order to self-evaluate the effectiveness of toothbrushing during the performance. The researcher will constantly advise the activity.
- At the end of the session, a participatory technique is proposed to consolidate the information received. "The collective secret" by Alina R. Avela Lazo [8].
- Materials: No need

### Development

- The place should be organized so that patients sit in circles according to the condition of each patient.

The evaluator will explain that one of the participants begins by secretly saying a question to the person sitting on his right and this in turn must pass it to the person on his right and so on the question is passed until the educator decides to end that round. The last one who heard the question, without saying it, must answer it, while those who did not hear it from the answer given must discover the question. It is confirmed whether or not it is the question, the answer is expanded and the round is restarted from the place where it stopped and thus playing questions will be formulated and answers will be elaborated that consolidate the information received.

### Relationship between the actions that make up the system

The dynamics developed by the system of actions, maintains a relationship that follows the following logic.

First, the presentation will be made, in a second moment and based on the definition of the concept of chemotherapy and its most frequent oral manifestations, the process is directed from the fulfillment of certain requirements aimed at knowing the characteristics of chemotherapy treatments and the most frequent oral manifestations.

In a third moment, based on the information acquired, we proceed to establish the relationship between the self-care measures that they must know to avoid the secondary oral manifestations of chemotherapy, in addition to promoting the willingness of patients to continue deepening these self-care measures.

In a fourth moment we proceed to demonstrate the technique of toothbrushing and the use of auxiliary means of dental cleaning as an effective method in the prevention of oral manifestations secondary to chemotherapy treatment.

Finally, information is synthesized through participatory techniques.

Once the previous actions have been systematized, consciously directed by the researcher, it can be affirmed that patients have internalized and made their own the information about the oral manifestations secondary to chemotherapy treatment, which leads to their transformation and, at the same time, to the formation of a preventive culture during the course of oncological treatment.

Hence, the system of actions occurs in practice in an interconnected manner; That is, each of the actions cannot be seen separately, because the absence of one of them affects the system as such.

### Evaluation of the partial implementation of the system of educational actions

For the evaluation of the partial application of the system of educational actions, the qualitative technique of focus group was used. With the 20 selected participants, 2 groups of 10 patients each were created. They also consisted of a moderator who led the session and an observer who kept the record. The session was conducted by a question guide, prepared by the author.

At the beginning of the actions it was difficult for the participants to express their ideas; Due to the atmosphere of trust that was generated they showed greater willingness for debate and it was necessary to explain in a clear, simple language the forms of presentation of each of the oral manifestations, since the first reaction of the patients was to refer that they did not have any lesion in the mouth that caused them concern, after the educational

actions all the patients referred that if they had oral manifestations and showed interest in knowing the causes and how to prevent them from getting worse. At the end, an analysis of the information generated through the guide of questions prepared for the focus group was carried out. The results obtained are detailed below.

Most patients offered answers related to oral diseases such as dental caries, gingivitis; not including in any case symptoms or signs related to Mucositis, Xerostomia and Dysgeusia, so the scarce level of information regarding this topic was observed. The patients responded, but always showed their doubts that they expressed through questions to the specialists, especially related to oral hygiene issues, symptoms that appeared after chemotherapy treatment and what self-care measures to perform. One person said: "I do not feel pain or discomfort anywhere in the mouth", another said "I do not feel anything either" and a third said that what he presented were canker sores, so almost generalized at the group level the debate was formed. By explaining clearly and directly the symptoms and signs such as: changes in the sense of taste, dry mouth and the appearance of painful ulcers that bother when ingesting solid and liquid foods. The researcher realized that at that moment they became aware of the problem, which shows their level of information on the subject.

Once the educational actions on the oral manifestations secondary to chemotherapy were carried out, a more detailed mastery of the consequences of their treatment for oral health and the measures they should know to avoid aggravating these manifestations was appreciated, they actively began to express their individual experiences and nourish themselves with all the information generated in the interrelation at the group level.

## Conclusions

Health education is a fundamental tool to raise the level of information on oral manifestations in patients treated with chemotherapy. In the population studied, the presence of oral manifestations secondary to chemotherapy and a regular level of information on the oral manifestations resulting from the treatment of their disease are observed. A system of educational actions is designed, with assessment by experts of its relevance as quite adequate and after its partial application a favorable variation of the information on the oral manifestations secondary to chemotherapy is obtained.

## Recommendations

To carry out an investigation with experimental design to evaluate the effectiveness of the proposed system of educational actions, in increasing oral health education on oral manifestations secondary to chemotherapy.

## Conflict of Interest

The authors declare that they have no conflict of interest in this research.

## Authors' Contribution

- **VPGC:** Conceptualization and ideas, data curation, formal analysis, fundraising, research, project management, supervision, visualization, original draft writing, writing, review.
- **MAHR, MZMS:** Conceptualization and ideas, data curation, research, supervision, visualization, writing, review.
- **LCTR, ICH:** Data curation, formal analysis, research, visualization, review.

## Bibliography

1. Acosta Farfán DA., *et al.* "Oral changes in paediatric patients undergoing oncological chemotherapy treatment". *VisDent* 23.3 (2021): 8-16.
2. Vega-Menchaca N., *et al.* "Oral diseases secondary to chemo and radiotherapy in patients with head and neck cancer". *Oral* 19.61 (2018): 1644-1651.
3. Valdivieso Urbina FF. "Thesis. Effect of radiotherapy and chemotherapy on oral health status. 2020-10 (2022).
4. Melo Álvarez JE. "Thesis. Oral manifestations as a consequence of chemotherapy in patients with head and neck cancer". 2020-10 (2022).
5. Ordoñez D., *et al.* "Dental care of cancer patients from the perspective of institutional actors in Cali, Colombia, 2019". *Colombian Dental Act* 10.1 (2019): 71-83.
6. Cruz PA., *et al.* "Risk factors for oral cancer". *Revista Cubana de Estomatología* 53.3 (2016).

7. Lee YH., *et al.* "Prospective evaluation of clinical symptoms of chemotherapy-induced oral mucositis in adult patients with acute leukemia: A preliminary study". *Clinical and Experimental Dental Research Res* 6.1 (2020): 90-99.
8. Parisuaña Yucra N and Cosislla Cruzado G. "Level of knowledge and attitude of relatives towards chemotherapy in children with cancer of the oncohematology service of the Edgardo Rebagliati Martins National Hospital (2019).
9. Velten DB., *et al.* "Prevalence of oral manifestations in children and adolescents with cancer submitted to chemotherapy. *BMC Oral Health* 17.49 (2017).
10. Jeldres Mathias., *et al.* "Pathogenesis and treatment of mucositis associated with radiotherapy and/or chemotherapy treatment in patients with head and neck cancer". *Revista Uruguaya De Medicina Interna* 6.1 (2016): 4-13.
11. Kusiak A., *et al.* "Oncological-Therapy Related Oral Mucositis as an Interdisciplinary Problem-Literature Review". *International Journal of Environmental Research and Public Health* 17.7 (2020): 2464.
12. Condori Escobar MDP. "Oral manifestations secondary to oncological chemotherapy treatment in patients attending Hospital III Daniel Alcides Carrión, Tacna" (2018).
13. Castillo Borja A and Montece Seixas E. "Oral health status in pediatric patients undergoing chemotherapy (2020).
14. Rebolledo-Cobos., *et al.* "Oral health status before, during and after antineoplastic treatment at a cancer institute in Barranquilla, Colombia". *Journal of Oral Research* 8.4 (2019): 316-324.
15. Sotolongo D. "Sancti Spíritus: Increases incidence of cancer. Escambray Newspaper: Sancti Spiritus (2018).
16. Balbis Cabrera M., *et al.* "Social perspective of self-care in patients with oral cancer". *Medical Humanities* 20.1 (2020): 167-188.
17. Nicot Navarro Ana María., *et al.* "Educational intervention concerning oral health in students of the primary school "Rodney Coutin Correa". *Rev. inf. Cient* 97.1 (2018): 457-465.
18. Peñaranda Correa F., *et al.* "Health education in public health: a pedagogical analysis". *Towards promoc. Health* (2017).
19. Díaz Brito Y., *et al.* "Generalidades sobre promoción y educación para la salud". *Revista Cubana de Medicina General Integral* 28.3 (2021).
20. Crespo TP. "Sixteen answers to questions about the criteria of experts in pedagogical research". Lima, Peru: Editorial San Marcos (2007).
21. Padilla Arteaga M and Rodríguez Pérez S. "Oral manifestations associated with antineoplastic treatment in pediatric patients. Systematic review". Montevideo, Uruguay: Universidad de la República (2020).
22. Chuchuca Guazhco L. "Oral manifestations and oral hygiene in pediatric patients who received chemotherapy year 2015". Solca-Cuenca (2016).
23. Ramos Francisco YM and Calero Barreto PA. "Educational intervention to modify knowledge about oral cancer in tobacco factory workers". *Rev Caribbean Social Sciences* 11.1 (2020).
24. García Chías B. "Prevalence of oral side effects to chemotherapy in a hospital in Madrid and associated factors". *Supportive Care in Cancer* 27.9 (2019): 3479-3490.
25. Velten DB., *et al.* "Prevalence of oral manifestations in children and adolescents with cancer submitted to chemotherapy". *BMC Oral Health* 17.1 (2017): 49.
26. Salcedo Hidalgo T. "Secondary oral lesions in patients undergoing chemotherapy in a hospital in Lima in 2019". Inca Garcilaso de la Vega University, Faculty of Stomatology (2019).
27. Lévano Villanueva C. "Management of the oncological patient by the general dentist". *rob* 3.1 (2019): 46-50.
28. Vera Álvarez ME Thesis. 2019-03 (2022):
29. Rodríguez González Gloria María., *et al.* "Level of knowledge about oral cancer in a sector of the population". *Rev. Med. Electron* 39 (2 (2017): 233-244.
30. Grajales Gómez L. "Strategy to reduce the severity of oral mucositis: oral care (2019).
31. Taibi R., *et al.* "Head and neck cancer survivors patients and late effects related to oncologico treatment: update of literature". *European Review for Medical and Pharmacological Sciences* 18.7 (2014): 1473-1481.

32. Ordóñez Daza DE., *et al.* "Evaluation of knowledge of oral cancer and dental management of cancer patients in Cali, Colombia". *Acta Odontológica Colombiana* 10.1 (2020): 47-59.
33. Cedeño Pérez MC. "Proposal of a system of actions for Environmental Education in the ETP". *Monograph* (2021).
34. González González JM., *et al.* "Educational actions in oral health Happy Alert. Methodological recommendations for its extension in Cuba". *INFODIR* (2000).
35. Zamora Corrales R., *et al.* "Theoretical considerations that support the system of educational actions to strengthen the identity of the sports culture in children in the practice of football in the municipality of Bayamo (Review)". *Olympia* 15.51 (2018): 01-13.
36. Collective of authors. Participatory techniques of Cuban educators. Editorial CIE "Graciela Bustillos" 1996 Havana Cuba (1996).