

An educational strategy on craniofacial anomalies for dental surgeons in Primary Health Care: design phase of the ADDIE Model

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Received: 01/28/2020. Approved: 06/25/2021.

ABSTRACT

The training of professionals for the Unified Health System is still a concern for managers, educational institutions and professionals, and Continuing Education strategies are a resource to improve professional practice. In this context, this study aimed to validate the contents and competencies in the field of craniofacial anomalies for the development of a distance-learning course in the ADDIE (analysis, design, development, implementation and evaluation) model for dental surgeons (DSs) working in Primary Health Care (PHC). The sample consisted of 16 specialists from the multiprofessional team of three referral centers for the treatment of craniofacial anomalies, and the Delphi method was used to reach consensus among them. In analyzing the answers, the minimum and maximum means were used, as well as the percentage of agreement based on the grouping of answers on a Likert scale. After the third Delphi round, with 90 to 100% agreement, the experts listed 10 general and 6 specific content components, as well as 9 general and 9 specific competencies. The design of the course on craniofacial anomalies for PHC DSs was achieved through content and competency validation by specialists in the field.

Descriptors: Validation Studies. Craniofacial Anomalies. Continuing Education. Curriculum. Dentistry.

1 INTRODUCTION

According to the National Curriculum Guidelines (DCN), the profile of dental surgeons (DSs) graduating from higher-education institutions should be based on a “generalist, humanistic, critical and reflective professional, who is able to work in all health care levels, in a multiprofessional manner, and transform reality through the performance of his/her activities”¹.

Therefore, curricular training periods in public health services favor the education of DSs through a combination of clinical gains and the establishment of bonds with patients and the health team, multidisciplinary teamwork in Primary Health Care (PHC) services, and a change in the understanding of health care networks².

In addition to undergraduate education, the training of professionals for the Unified Health System (SUS) is still a concern for managers, educational institutions and professionals, therefore, Continuing Education (CE) strategies are used to improve professional practice. The Ministry of Health defines CE as on-the-job learning, with the teaching-learning process incorporated into the daily routine in order to improve the quality of health services³. The incorporation of information technology becomes a facilitator in the training process because it allows the construction and improvement of knowledge without the need for students’ presence in a physical location, facilitating access to education⁴.

It is observed that there is a limitation to the knowledge of PHC DSs regarding the treatment of individuals with craniofacial anomalies, since much is said about corrective surgery, but little is discussed about dental treatment aiming at the correct development of the masticatory, respiratory, speech, and swallowing functions^{5,6}.

Therefore, we proposed to validate the content and competencies in the field of

craniofacial anomalies of a distance learning (DL) course. For the development of the distance learning course, the ADDIE model was adopted - analysis, design, development, implementation and evaluation - in which content validation is an integral part of the design phase⁷.

2 METHODOLOGY

This is an exploratory methodological-development study, referring to a process of content validation for a DL course, based on the Delphi method, in order to identify the appropriate content and competencies on the subject. It is part of the actions by the Tele-education Program of the Center for Care of Facial Defects at the Institute for Integral Medicine Prof. Fernando Figueira (CADEFI-IMIP).

The Delphi method is a set of questionnaires that are sequentially answered by the participants with summarized information about the group’s answers to the previous questionnaires in order to determine a form of dialogue among the participants and gradually build a collective response^{8,9}.

In this study, the Delphi method was prepared according to the classic model, in three rounds¹⁰, following the steps listed in figure 1.

The study was conducted with professionals from the multidisciplinary team of three referral centers located in the northeastern, southeastern, and southern regions for treatment of craniofacial anomalies. The centers were identified on the website of *Associação Brasileira de Fissuras Lábio Palatinas (ABFLP)* and should provide care exclusively for SUS patients. Also, the respondents should have at least five years of experience in the treatment of craniofacial anomalies.

The initial contact was made with the centers’ staff managers, who provided an invitation and data-collection link using Google Forms. The study was approved by the Research

Ethics Committee (Report no. 3.077.876 and CAAE 02940518.3.0000.5201), in compliance with Resolution no. 510/2016 by the National Health Council. The informed consent form (ICF) was included in the first section of the

questionnaire sent by email in each round. Soon after adherence, the experts were asked to answer about their education (undergraduate studies and specialization) and the referral center to which they belonged.

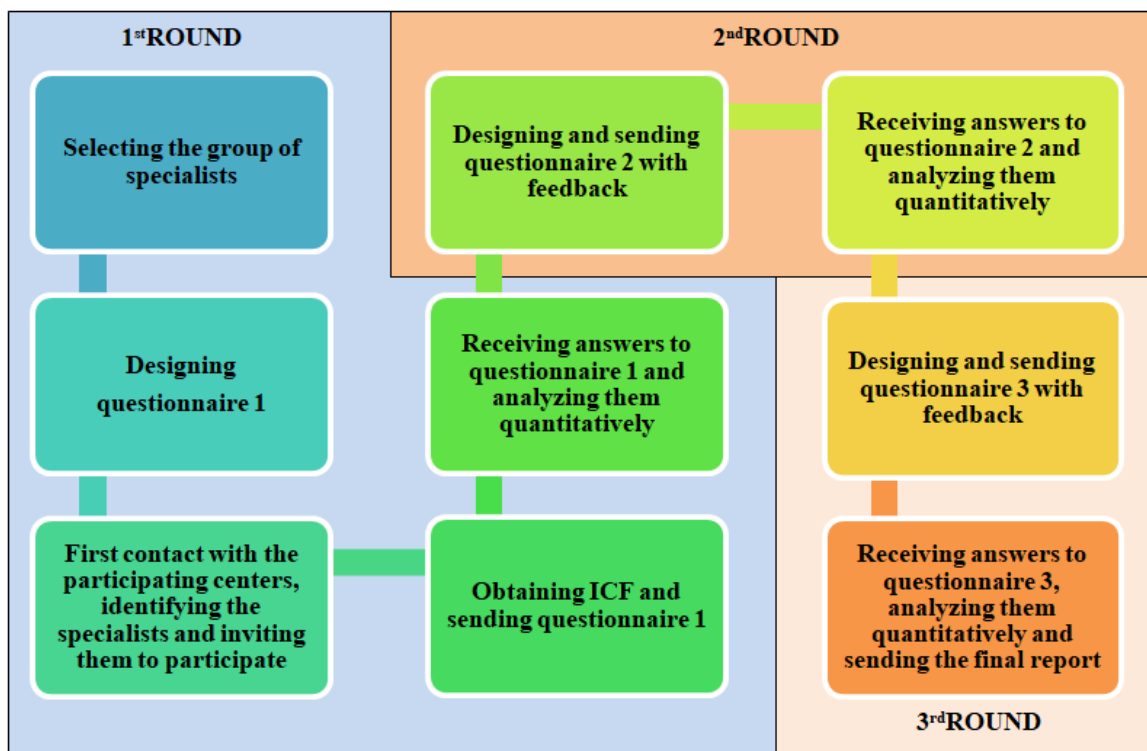


Figure 1. Steps of the Delphi method for consensus building

The collection instrument in the 1st round consisted of four open questions to suggest the general content and competencies that were relevant to the topic of craniofacial anomalies, as well as the relevant specific content and competencies of Dentistry in the same topic. For data analysis, a qualitative approach was considered, identifying the suggested topics.

In the 2nd round, the researchers designed an instrument with 13 general-content items, 12 general-competency items, 6 specific-content items, and 8 specific-competency items to be analyzed, using a seven-point Likert-type scale

so as to investigate the importance of each item, starting from 0 - no importance; 1 - almost no importance; 2 - little importance; 3 - medium importance; 4 - important; 5 - very important; 6 - extremely important; and 7 - not applicable. Additionally, an open field was provided for suggestions on the main types of craniofacial anomalies.

In the 3rd round, the same instrument used in the previous round was applied to the items that were modified. In order to assess agreement for the final proposed model, an instrument with 10 general-content items, 11 general-

competency items, 6 specific-content items, and 9 specific-competency items was submitted to judgment using a five-point Likert-type scale: 1 - I totally disagree; 2 - I partially disagree; 3 - I neither agree nor disagree; 4 - I partially agree; and 5 - I totally agree.

For data analysis, the mean of the answers, minimum and maximum values, were used to scale the hierarchy of importance and content agreement. A percentage of importance and agreement was utilized, having a cutoff point of 80% in the 2nd round, and 90% in the 3rd round, according to the following formulas¹¹:

Importance percentage = number of answers 6, 5 and 4 / total number of answers * 100

Agreement percentage = number of answers 5 and 4 / total number of answers * 100

Additionally, items that were rated 1 - "strongly disagree" or 2 - "partially disagree" in Round 3 were excluded.

3 RESULTS

The study sample consisted of 16 experts, of whom 9 were dentistry specialists: Restorative Dentistry (1), Endodontics (1), Orthodontics (6), and Periodontics (1); 3 were plastic surgeons; 3 were speech therapists; and 1 was a social worker.

In the 1st round, with the participation of 11 specialists, the following topics were listed as general contents, in descending order: 1) types and classification, addressing clefts and genetic syndromes (eight specialists); 2) anatomy and physiology, contemplating anatomy, craniofacial growth and development, and neuropsychomotor development (six specialists); 3) multiprofessional treatment and protocols, addressing chronology and multiprofessional treatment protocols, basic care, and treatment benefits (six specialists); 4) embryology (four specialists); 5) epidemiology,

emphasizing prevalence and incidence in the country (three specialists); 6) etiology (two specialists); and 7) psychosocial aspects in addressing patient embracement (one specialist).

As for the specific contents, the following were listed: 1) dental treatment, discussing oral health maintenance and dental specialties (three specialists); 2) stomatognathic system alterations as a diagnosis, tooth-number and shape alterations (two specialists); 3) anatomy and physiology with emphasis on facial growth (one specialist); 4) multidisciplinary treatment (one specialist); a dental surgeon specialist suggested an orthodontic approach; and 5) periodontal approach (one specialist). The non-dental professionals did not provide any contributions.

The professionals found it difficult to list general and specific competencies; therefore, it was necessary for the researchers to propose them, based on the answers about knowledge, making it evident that a competency is what DSs are able to accomplish after the course.

Twelve specialists participated in the 2nd round, and in analyzing the answers, it was observed that the lowest percentage was 83% for the general component. The epidemiology content was the item with the lowest mean, although 83% of the specialists corroborated the importance of knowing about the local epidemiology of craniofacial anomalies, considering that it is more relevant to PHC DSs. Therefore, for the 3rd round, the item that addressed the global epidemiology of craniofacial anomalies was excluded.

The specialists reported the importance of PHCDSs' knowledge about the main craniofacial anomalies, highlighting 8 major types in the open field: 1) cleft lip and palate; 2) rare clefts; 3) Pierre Robin sequence; 4) Van der Woude syndrome; 5) craniofacial dysostoses (Apert and Crouzon syndromes); 6) ectodermal

dysplasia; 7) holoprosencephaly; and 8) Treacher Collins syndrome.

A modification was necessary for the third round, since a rating of 1 - “almost unimportant”-occurred for the general competency “Knowing the specialized referral center for the treatment of craniofacial anomalies”.

There was consensus on all items for specific contents and specific competencies. The dental alterations to be addressed by the course were: 1) dental anomalies affecting tooth shape, number and position; 2) alveolar bone defects; 3) atresia of bone bases, especially maxillary; 4) sagittal discrepancy of bone bases; 4) alterations in chewing, swallowing, breathing and phonation. A specific content was changed, with the inclusion of the expression ‘notions of orthodontic treatment’ for the third round, as well as the addition of a specific competency for this topic.

Given the high percentage of agreement among the specialists regarding the importance of the topics presented, the 3rd round, with the participation of 10 respondents, involved only the analysis of the items that were changed/included from the same scale used in the previous round, reaching a minimum percentage of 90%.

Also in the 3rd round, these items were incorporated into questionnaire 3, consisting of general contents (Gcont), general competencies (Gcomp), specific contents (Scont), and specific competencies (Scomp) to be validated for agreement by the specialists. In analyzing the answers in the 3rd round, it is observed that the lowest percentage for the general content was 90% (Items Gcont3 and Gcont7) (Chart 1).

For the general competency, the lowest agreement percentage was 80%, which justifies the exclusion of item Gcomp11 without compromising the result, as it fits into item Gcomp10 (Chart 1). The same occurs to item

Gcomp7, justifying its exclusion by classification 2 “I partially disagree” and its inclusion in item Gcomp8 (chart 1).

For the specific component, there was 100% agreement for all items of the specific contents and competencies.

4 DISCUSSION

The content validation stage of a curriculum proposal should undergo a process of analysis by experts^{9,12}. Therefore, the ADDIE model was used for the design of the educational strategy, where the contents and competencies were defined and validated according to what was proposed in the design phase of that model¹³.

The characteristics of participants in the Delphi method, regarding their professional category, were similar to those recommended by the World Health Organization for the treatment of individuals with craniofacial anomalies, which ensured heterogeneity in the responses even with the non-contribution of three professional categories: Nutrition, Psychology, and Nursing. The treatment should be interprofessional, involving Medicine, Dentistry, Speech Therapy, Psychology, Nursing, Nutrition, and Social Work¹⁴.

The number of participants’ contributions was a critical point in this study, since we considered all professionals from the multiprofessional teams of three referral centers for craniofacial anomaly care. Despite the abstentions, the result was not compromised, since the Delphi method must include a minimum of 10 and a maximum of 30 specialists in the sample. The participation of fewer than 10 compromises the results in relation to the consensus and relevance of the answers, while a large number generates a huge amount of data, which results in complex administration and analysis¹⁰.

Chart 1. Mean, agreement percentage, minimum and maximum, of the contents and their respective competencies in the 3rd round of the Delphi method

| GENERAL CONTENT | | | | | GENERAL COMPETENCY | | | | |
|--|------|-----|-----|-----|---------------------|-----|-----|-----|--|
| Item | Mean | % | Min | Max | Mean | % | Min | Max | Item |
| Gcont1. Definition of a craniofacial anomaly | 4.9 | 100 | 4 | 5 | | | | | |
| Gcont6. Anatomy and physiology of craniofacial anomalies | 4.6 | 100 | 4 | 5 | 5 | 100 | - | 5 | Gcomp3. Diagnosing and recognizing the most frequent types of craniofacial anomalies |
| Gcont2. Diagnosis of the main craniofacial anomaly types | 5 | 100 | - | 5 | | | | | |
| Gcont3. Embryology of the main craniofacial anomalies | 4.4 | 90 | 3 | 5 | 4.6 | 100 | 4 | 5 | Gcomp1. Understanding the embryology and etiology of the main craniofacial anomalies |
| Gcont5. Etiology of the craniofacial anomalies | 4.5 | 100 | 4 | 5 | | | | | Gcomp2. Understanding the epidemiology of the main craniofacial anomalies, with emphasis on the local community. |
| Gcont4. Epidemiology of craniofacial anomalies, with emphasis on the local community | 4.7 | 100 | 4 | 5 | 4.5 | 100 | 4 | 5 | Gcomp9. Working in health promotion and in the prevention of craniofacial anomalies |
| | | | | | 5 | 100 | - | 5 | Gcomp10. Embracing and educating patients with craniofacial anomalies and their relatives |
| Gcont7. Treatment of craniofacial anomalies | 4.7 | 90 | 3 | 5 | 5 | 100 | - | 5 | Gcomp11. Respecting the desire for treatment protocol continuity or non-continuity of patients with craniofacial anomalies and their family members |
| Gcont 7.1. The role and importance of professionals in the multiprofessional treatment of craniofacial anomalies | 5 | 100 | - | 5 | 4.1 | 80 | - | 5 | Gcomp5. Recognizing the role and importance of the specialized care center's multiprofessional team |
| Gcont 7.2. Multiprofessional treatment protocol for craniofacial anomalies | 4.9 | 100 | 4 | 5 | 5 | 100 | - | 5 | Gcomp7. Being aware of national and international protocols that are relevant to the practice and management of craniofacial anomalies |
| Gcont 7.3. The importance of treatment's being performed at the referral center for craniofacial anomalies | 4.8 | 100 | 4 | 5 | 4.4 | 90 | 2 | 5 | Gcomp8. Understanding the interventions and treatment protocols in the rehabilitation of craniofacial anomaly patients |
| | | | | | 4.7 | 100 | 4 | 5 | Gcomp12. knowing the rights of individuals with craniofacial anomalies |
| | | | | | 4.6 | 100 | 4 | 5 | Gcomp4. knowing the name and location of the referral center for the treatment of craniofacial anomalies in order to be able to refer to it |
| | | | | | 4.9 | 100 | 4 | 5 | |
| SPECIFIC CONTENT | | | | | SPECIFIC COMPETENCY | | | | |
| Item | Mean | % | Min | Max | Mean | % | Min | Max | Item |
| Scont1. Diagnosis of the main stomatognathic system alterations in patients with craniofacial anomalies | 5 | 100 | - | 5 | 4.83 | 100 | 4 | 5 | Scomp2. Diagnosing the main stomatognathic-system alterations in patients with craniofacial anomalies |
| | | | | | 4.5 | 100 | 4 | 5 | Scomp1. Knowing the stomatognathic system anatomic-physiology in patients with craniofacial anomalies |
| | | | | | 4.57 | 100 | 4 | 5 | Scomp8. Differentiating the concept of patients with craniofacial anomalies from that of patients with disabilities |
| Scont2. Oral health promotion in infants, children, adolescents, adults and the elderly with craniofacial anomalies | 5 | 100 | - | 5 | 5 | 100 | - | 5 | Scomp5. Promoting oral health actions in patients with craniofacial anomalies and their family members |
| | | | | | 5 | 100 | - | 5 | Scomp3. Understanding and advising patients with craniofacial anomalies and their families on primary oral health care |
| Scont3. Dental anesthesia techniques in patients with craniofacial anomalies | 4.83 | 100 | 4 | 5 | 4.83 | 100 | 4 | 5 | Scomp4. Understanding the anatomic-physiological alterations of craniofacial anomalies to safely perform dental anesthesia techniques |
| Scont4. Dental treatment in infants, children, adolescents, adults and the elderly with craniofacial anomalies | 5 | 100 | - | 5 | 5 | 100 | - | 5 | Scomp6. Performing dental treatment in patients with craniofacial anomalies |
| Scont5. Notions of orthodontic treatment in children and adults with craniofacial anomalies | 4.83 | 100 | 4 | 5 | 4.67 | 100 | 4 | 5 | Scomp9. Diagnosing malocclusions that require early intervention in individuals with craniofacial anomalies |
| Scont6. Management of dental emergencies of patients with craniofacial anomalies | 5 | 100 | - | 5 | 5 | 100 | - | 5 | Scomp7. Understanding the management of dental emergencies in patients with craniofacial anomalies |

Gcont: general contents; Gcomp: general competencies; Scont: specific contents; Scomp: specific competencies.

The specialists found it difficult to list the general and specific competencies to be developed for craniofacial anomaly care. This can be explained by the presence of the biomedical health care model, which objectively observes the disease, thus excluding the subjective aspects that accompany any condition¹⁵. Furthermore, the respondents may have found it difficult to understand the term “competency”, given that expertise in the teaching field was not required. The researchers described the competencies for round 2 based on the content descriptions.

Among the main craniofacial anomalies reported by the specialists, the cleft lip and/or palate and associated syndromes, such as Van der Woude’s and Pierre Robin’s sequence, are highlighted. The answers are in agreement with the literature, since cleft lips and palates are very frequent congenital orofacial anomalies in human beings, with an incidence of 1:650 live births, i.e., 1.53 per thousand live births, and in Brazil, the prevalence ranges from 0.19 to 1.54 per thousand live births^{5,16}.

It is essential that DSs promote oral health in infants, children, adolescents, adults and the elderly with craniofacial anomalies, as well as contribute to their treatment, considering that such anomalies deeply affect the lives of individuals and their families since their treatment requires multiple interventions throughout life. Therefore, PHC DSs should emphasize the prevention of oral diseases, seeking to motivate all family members to take care of their health as well as to be prepared to advise parents and guardians throughout the rehabilitation treatment^{5,17}.

Besides performing less complex curative procedures, PHC DSs can prevent morbidity aggravation for patients with craniofacial anomalies by identifying malocclusions early¹⁸. For this reason, the item on orthodontic treatment notions was added along with its respective competency. The need for orthodontic treatment in

patients with craniofacial anomalies is more frequent and, for this reason, there are differentiated incentives from the federal government to subsidize the procedures in referral centers¹⁹.

The most complex interventions to treat craniofacial anomalies are performed in specialized centers or public and private hospitals²⁰. Thus, it is necessary to understand the importance of providing treatment in the referral center for craniofacial anomalies, since the articulation of patient referrals to other SUS services favors care integrity and continuity²¹.

Although a care provision network does not officially exist, the structure of care for individuals with anomalies must go through all complexity levels, thus making it possible to guarantee their rights to access, completeness, and continuity. For this reason, knowing the rights of patients with craniofacial anomalies was established as a competency in item Gcomp12, as the evaluation of service users’ perception and the promotion of health education spaces strengthen the social participation, the autonomy of this segment, and the right to information, as provided for in Law number 8.080, passed on September 19th, 1990²².

Acknowledging the role and importance of professionals in the multiprofessional treatment of craniofacial anomalies through an interdisciplinary approach at the specialized care center is understood as essential. Such agreement is in line with the study that examined the documents published by the American Cleft Palate-Craniofacial Association (ACPA) regarding the information about the service and the role of each professional on the team²³.

Given the difficulty in establishing continuing education for professionals in the network, the DL strategy is closer to a more viable reality, as they can accomplish it asynchronously, without the need for displacement²⁴. Distance learning courses for continuing education in oral health are scarce, even though the organization of

the continuing education process through DL has been one of the strategies for qualifying the Family Health Care team (ESF) for almost two decades²⁵. Once again, the importance of designing a course on craniofacial anomaly treatment for PHC DSs is highlighted.

In the short term, the study brings contributions to the development phase, which is the next phase of the ADDIE model, and in the long term, it seeks to strengthen dental surgeons' role in caring for people with craniofacial anomalies and improving the quality of care. It also seeks to encourage them to build a bond and provide shared care. This will contribute to the decentralization and optimization of services, as well as to the acceptance and adherence to treatment by individuals with craniofacial anomalies²⁶.

6 CONCLUSION

The design of the course on craniofacial anomalies for PHC DSs was achieved through analysis by specialists in the field. Ten general contents, six specific contents, nine general competencies and nine specific competencies were listed for a distance-learning educational strategy. The next phase is the selection of pedagogical resources and the development of the educational proposal for dental surgeons.

RESUMO

Estratégia educacional sobre anomalias craniofaciais para cirurgiões-dentistas da Atenção Primária à Saúde: fase de desenho do Modelo ADDIE

A formação dos profissionais para o Sistema Único de Saúde ainda é uma preocupação de gestores, instituições de ensino e profissionais, sendo as estratégias de Educação Permanente um recurso para aprimorar a prática profissional. Nesse contexto, o presente estudo teve como objetivo realizar a validação de conteúdos e competências na área de anomalias craniofaciais para o desenvolvimento de um

curso no modelo ADDIE (análise, desenho, desenvolvimento, implementação e avaliação), na modalidade ensino a distância, para os cirurgiões-dentistas (CD) da Atenção Primária à Saúde (APS). A amostra foi composta por 16 especialistas da equipe multiprofissional de três centros de referência no tratamento das anomalias craniofaciais e utilizou-se o método Delphi para atingir o consenso entre eles. Na análise das respostas, utilizou-se a média, mínima e máxima, como também o percentual de concordância com base no agrupamento das respostas em escala Likert. Após a terceira rodada do Delphi, com 90 a 100% de concordância, os especialistas elencaram 10 conteúdos gerais e 6 específicos, 9 competências gerais e 9 específicas. O desenho do curso sobre anomalias craniofaciais para CD da APS foi obtido por meio da validação de conteúdos e competências por especialistas da área.

Descritores: Estudos de Validação. Anomalias Craniofaciais. Educação Permanente. Currículo. Odontologia.

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