

EXPERIMENTAL SOUND CORRECTION GAMES FOR CHILDREN 3-6 YEARS OLD AFTER CLEFT LIP - PALATE REPAIR SURGERY IN HO CHI MINH CITY

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ARTICLE INFORMATION ABSTRACT

Journal: Vinh University
Journal of Science
Educational Science and Technology
p-ISSN: 3030-4857
e-ISSN: 3030-4784

Volume: 53

Issue: 4C

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Received: 13 September 2024

Accepted: 29 October 2024

Published: 20 December 2024

Citation:

Pham Tran Thuy Khue, Nguyen Hoa Phuong (2024). *Experimental sound correction games for children 3-6 years old after cleft lip - palate repair surgery in Ho Chi Minh city.* *Vinh Uni. J. Sci.* Vol. 53 (4C), pp. 37-44
doi: 10.56824/vujs.2024c141c

There have been many studies on treatment methods and phonetic support to help children with cleft lip - palate have more opportunities to integrate into everyday life. However, studies on the effectiveness of sound correction games for children with cleft lip - palate after surgery have yet to be conducted. In this article, we experimented with a sound correction game for children aged 3-6 after cleft lip and palate surgery. The experimental results showed that after surgery, children with cleft lip and palate could correct most of the errors they made. Depending on each case and the degree of deformity, the ability to progress will vary over time and usually fluctuate from 22 to 24 months with an intervention frequency of 2-3 sessions/week. The experimental results also clearly show that the sound correction process for children with cleft lip and palate after surgery at school age will help them have more opportunities to achieve their expectations in daily life and study.

Keywords: Children aged 3-6; cleft lip and palate; sound correction game.

1. Introduction

Children who undergo cleft lip and palate surgery often face challenges with pronunciation and communication, necessitating an effective speech correction program. This process begins immediately after surgery and continues until school age, with adjustments to the intervention content based on the child's developmental stage. Without timely, adequate, and effective intervention, speech disorders may persist, causing difficulties in articulation. Consequently, children with cleft lip and palate often experience feelings of inferiority, reluctance to communicate, and obstacles in social integration.

Recognizing these challenges, we understand that an important responsibility of early childhood education is to facilitate phonetic correction to improve communication skills, helping children lead more confident lives. Given the practical need for children

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to learn through play and the philosophy of “learning through play, playing while learning”, games serve as an effective and engaging medium for children to acquire knowledge. This is particularly significant for children with cleft lip and palate, for whom resources for speech-corrective games are scarce. This scarcity can hinder the process of improving speech clarity and delay effective communication development.

In this study, we conducted experiments with a system of phonetic correction games for children aged 3-6 years after cleft lip and palate surgery in Ho Chi Minh City.

2. Experimental studies on phonetic correction games for postoperative cleft lip and palate children

2.1. Phonetic correction and games for postoperative cleft lip and palate children

In this article, “phonetic correction” refers to the process of adjusting and correcting articulation errors in children after cleft lip and palate surgery. The term “phonetic correction”, when searched online, yields significantly more results (60,500) than “speech therapy” (14,400) (H. L. Pham, 2022). Furthermore, “phonetic correction” aligns with the terminology system in medicine, such as “orthopedics” (Ngo, 1984).

Phonetic correction games are designed to help children with cleft lip and palate overcome articulation errors, improving their communication skills and enabling them to integrate into normal life. These games must ensure structured interaction between the instructor and the child to effectively address speech difficulties. They should also be age-appropriate and accessible, making the “phonetic correction” process more enjoyable. Integrating language education into games allows them to be implemented both in educational settings and at home.

Levels of game usage:

- **Level 1: Pre-learning games** - Teachers organize games to activate a lively classroom atmosphere, preparing children for lessons.

- **Level 2: Games as a learning tool** - Teachers use games to deliver lesson content in an engaging and interactive manner.

- **Level 3: Games as the learning content** - Teachers guide children through game-based scenarios, enabling self-discovery of learning materials.

System of phonetic correction games: This study adopts a system of phonetic correction games designed for children after cleft lip and palate surgery, referenced from prior research (T. T. K. Pham & Nguyen, 2024). This system is based on theoretical insights into the linguistic characteristics of postoperative cleft lip and palate children, which include:

- Games for enhancing articulation organs.
- Games for auditory training.
- Games for pronunciation practice.
- Games for improving speech intonation.
- Games for correcting articulation errors.

2.2. Methods for organizing phonetic correction games

Games were conducted 1-2 sessions per week, each lasting 30 minutes, with a 1:1 teacher-child interaction model. Activities included:

- **Warm-up games** for articulation organs (5 minutes).
- **Pronunciation practice games** to guide children in articulating sounds (5 minutes).
- **Error recognition games** to identify and correct articulation errors (5 minutes).
- **Listening and speaking reflex games** to enhance auditory responses (5 minutes).
- **Speech intonation training games** to improve clarity and articulation (5 minutes).
- **Relaxation games** focusing on breathing exercises (5 minutes).

Principles for participant selection: Participants were selected based on direct observation, interviews with guardians, and consultations with doctors or speech therapy experts.

Principles of experimentation:

- **Systematic Approach:** Games were designed specifically for children with cleft lip and palate post-surgery, with outcomes aimed at improving articulation.
- **Comprehensiveness:** Experiments targeted speech development and error recognition.
- **Educational Value:** Activities promoted learning, self-education, and behavioral adjustment.
- **Developmental Focus:** Games aimed to unlock children's potential and foster sustainable linguistic development.
- **Appropriateness:** Activities were tailored from simple to complex, ensuring progression and engagement.

Additionally, experiments adhered to principles of dynamic visualization, suitable durations for children's psychological traits, diversified content and methods, and detailed progress tracking of children's development through interventions.

Speech sample collection: We utilized a word list by Tang and Barlow (2006), selecting 20 monosyllabic words: *mouse, duck, towel, wood, red, flower, sleep, meat, jackfruit, pear, corn, grape, fly, play, pants, paper, man, fan, river, Buddha*.

Experimental procedure:

- Step 1: Initial assessment of pronunciation capabilities: Conduct a preliminary evaluation of the child's pronunciation abilities and compile a list of articulation errors.
- Step 2: Developing an articulation correction plan: Design a tailored plan for articulation correction, incorporating appropriate games to facilitate learning.
- Step 3: Implementation of experimental content: Organize pronunciation exercises following progression from easy to difficult and simple to complex tasks.
- Step 4: Evaluation and adjustment: Analyze the results obtained and develop subsequent articulation correction plans aimed at long-term improvement.

The guidance process involves the following steps:

Step 1: Using a picture, the instructor asks the child a guiding question (e.g., *What is this?* or *Who is this?*).

- If the child answers correctly, record the response and proceed to the next picture.
- If the child answers incorrectly or does not respond, move to Step 2.

Step 2: Provide a hint.

- If the child answers correctly, record the response and proceed.
- If the child answers incorrectly or does not respond, move to Step 3.

Step 3: Offer choices that include the target word (e.g., *Is this a duck or a chicken?*).

- If the child answers correctly, record the response and proceed.
- If the child answers incorrectly or does not respond, move to Step 4.

Step 4: Provide the correct answer and encourage repetition (e.g., *This is a duck. What is it?*).

Note: Audio samples should be collected in a quiet, noise-free environment.

Articulation error analysis: Use phonetic recording sheets to analyze pronunciation errors by comparing the child's articulated phonemes with the target phonemes to identify inaccuracies.

Data processing: Mathematical statistical methods were applied using tools like Google Sheets and Excel to quantify and process data during the research. The process involved:

- Preparing and organizing data for analysis.
- Reading and coding the data.
- Identifying analysis themes.
- Organizing and categorizing themes.
- Establishing models and interconnections between themes.
- Interpreting the data.
- Drawing conclusions and reporting findings.

3. Experimental games for articulation correction in post-surgical children with cleft lip and palate

3.1. Speech correction game experiment - Case 1

General information

- Subject: Đ.L.A.Q (Female, 4 years old)
- Residence: Angel [Thiên thần] Shelter, Ong Nieu Hamlet, District 9, Ho Chi Minh City.

Evaluation of cleft lip and palate condition

- The child has a unilateral incomplete cleft lip on the right side.
- General health is unaffected, with minor nasal deformation and negligible impact on teeth and dental arch.

Language assessment before intervention

- Errors in bilabial and labiodental sounds, including initial consonants /b/, /p/, /m/, /f/, /v/.
- Nasalization phenomenon: mispronunciation of /c/ as /ɲ/.
- Shy and reluctant to communicate.

Training games

- Phonetic correction games:

- “*Holding paper*”: Exercises upper and lower lip coordination for /m/ articulation.
- “*Lizard’s call*”: Tongue exercises to support /c/ articulation.

- Error correction games:

- Reciting poetry.
- “*Follow the teacher’s lead*” repetition game.

Speech correction results**- Phase 1 (October 2023 - January 2024):**

- Persistent errors with consonants /p/, /f/, /v/.
- Nasalization remains.
- Speech improved: more polite expressions, clearer communication of needs.
- Demonstrates increased social interaction, greeting others warmly.

- Phase 2 (March 2024 - July 2024):

- Nasalization reduced significantly.
- Correct articulation of initial consonants /p/, /m/, /v/ in single words.
- Clearer communication in natural interactions.

Future directions

- Expand vocabulary and create more opportunities for communication practice.
- Collaborate with caregivers to practice at home, providing instructional materials for phonetic correction games.

3.2. Speech correction game experiment - Case 2**General information**

- Subject: N.T.M.D (Female, 4 years 2 months old).
- Residence: Ward 22, Binh Thanh District, Ho Chi Minh City.

Evaluation of cleft lip and palate condition

- The child has a complete unilateral cleft lip on the right side.
- Nasal characteristics: flattened nostril and deviated nasal septum.
- Prone to throat infections.

Language assessment before intervention

- Loss of all initial consonants, including /χ/, /γ/, /k/, /ŋ/, /h/, /β/, /t/.
- Significant nasal voice.
- Rapid articulation due to shortened sound production time.
- Uses “ê a” sounds to substitute for intended words.
- Shy in communication but good receptive language skills.

Training games**- Phonetic correction games:**

- “*Holding paper*”: Upper and lower lip coordination for /m/ articulation.
- “*Lizard’s call*”: Tongue exercises for /c/ articulation.

- Error correction games:

- Reciting poetry.

- Speech organ development games:

- “*Blowing paper*” and “*Ship docking*”: Breathing control.
- “*Feeding the chicken*”: Lip exercises for /b/.
- “*Snake hunt*”: Tongue exercises.

Speech correction results**- Phase 1 (June 2023 - September 2023):**

- Still shy and hesitant to speak.
- Improved articulation of /m/, /b/, /t/ but continued loss of other consonants.
- Nasal voice persists.

- Phase 2 (September 2023 - December 2023):

- More open in interactions.
- Improved articulation of /k/ and better bilabial sounds.
- Inconsistent articulation of /ŋ/ and /y/.

- Phase 3 (December 2023 - May 2024):

- Demonstrates confidence and agility in communication.
- Significant reduction in nasal voice.
- Clear and accurate articulation, with minor errors in some initial consonants.

Future directions

- Continue speech correction with parental collaboration and regular vocabulary enrichment.
- Provide game instructions for home practice.

3.3. Speech correction game experiment - Case 3

General information

- Subject: P.H.Đ (Male, 5 years 8 months old).
- Residence: Lives with grandmother and aunt near Tu Te Church, Duc Tin, Duc Linh, Binh Thuan Province.

Evaluation of cleft lip and palate condition

- Bilateral incomplete cleft lip with a thin groove on the vermilion border.
- Mild nasal base widening but minimal structural deformation.
- History of pneumonia.

Language assessment before intervention

- Shy and reluctant to answer, often responds briefly.
- Errors in fricatives /χ/, glottalized stops /b/, and bilabial sounds /f/, /p/.
- Glottalization errors for /t/, /d/, /v/, /l/, /t^h/, /k/, /ŋ/, /z/, /ʒ/.

Training games

- Phonetic correction games:

- “*Holding paper*”: Lip coordination for /m/.

- Speech organ development games:

- “*Blowing paper*” and “*Ship docking*”: Breathing control.
- “*Feeding the chicken*”: Lip exercises for /b/.
- “*Snake hunt*”: Tongue exercises.

- Error correction games:

- “*Rooster Call*”.

- Reciting poetry.

- Intonation training games:

- “*Emotion Faces*”.
- “*Blowing Balloons*”.

Speech correction results

- Phase 1 (May 2023 - August 2023):

- Improved interaction with others.
- Accurate bilabial articulation after three months.
- Glottalization errors persist.

- Phase 2 (August 2023 - January 2024):

- Increased initiative and politeness in communication.
- Correct articulation of /t/, /d/, /v/ after six months.

- Phase 3 (January 2024 - May 2024):

- Confident in communication.
- Clear and intelligible speech, with loud and distinct voice.
- Resolution of glottalization errors in /l/, /t^h/, /k/, /ŋ/, /z/, /ʃ/, /ʒ/.

Future directions

- Continue monitoring and speech training in collaboration with family.
- Regularly create opportunities for verbal expression to enhance active communication.
- Provide game instructions for home practice.

4. Conclusion

The experimental cases demonstrate that common speech errors include initial consonant deletion, initial consonant substitution, and minor tone errors, while vowel errors are rarely observed. These speech errors significantly hinder language development, creating barriers to learning and communication. Without timely post-surgical speech therapy and regular practice environments, children with cleft lip and palate may develop entrenched speech habits that are difficult to correct. Speech intervention experiments should be goal-oriented, aiming to improve articulation, expand vocabulary, and enhance communication skills. The results indicate that children with cleft lip and palate can overcome most speech errors following surgery. Progress varies depending on the individual case, the severity of the condition, and the duration of therapy, typically taking 22 to 24 months with 2-3 sessions per week. Furthermore, the findings underscore that speech intervention for school-aged children with cleft lip and palate provides them with greater opportunities for success in both academic and daily life. To maximize effectiveness, speech therapy requires close collaboration among teachers, parents, medical professionals, and speech-language therapists.

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TÓM TẮT

THỰC NGHIỆM TRÒ CHƠI CHỈNH ÂM CHO TRẺ 3 - 6 TUỔI SAU PHẪU THUẬT VÁ KHE HỖ MÔI - VÒM MIỆNG TẠI THÀNH PHỐ HỒ CHÍ MINH

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Ngày nhận bài 13/9/2024, ngày nhận đăng 29/10/2024

Đã có nhiều nghiên cứu về cách thức điều trị, hỗ trợ ngữ âm góp phần giúp cho trẻ bị khe hở môi - vòm miệng có thêm cơ hội hòa nhập với cuộc sống bình thường. Tuy vậy, những nghiên cứu về hiệu quả của việc sử dụng trò chơi chỉnh âm cho trẻ bị khe hở môi - vòm miệng sau khi tiến hành phẫu thuật vá vẫn chưa được tiến hành. Bài viết này, chúng tôi thực nghiệm trò chơi chỉnh âm cho trẻ 3-6 tuổi sau phẫu thuật vá khe hở môi - vòm miệng. Kết quả thực nghiệm đã cho thấy trẻ bị khe hở môi - vòm miệng sau phẫu thuật đã có thể khắc phục đa số lỗi mắc phải. Tùy vào từng ca bệnh, mức độ dị tật mà khả năng tiến bộ sẽ khác nhau theo thời gian và thường dao động từ 22 đến 24 tháng với tần suất can thiệp từ 2-3 buổi/tuần. Kết quả thực nghiệm cũng đồng thời chỉ rõ được quá trình tác động chỉnh âm đối với trẻ bị khe hở môi - vòm miệng sau phẫu thuật trong độ tuổi đi học sẽ giúp các em có nhiều cơ hội đạt được những điều mong đợi trong cuộc sống thường ngày lẫn việc học tập.

Từ khóa: Trẻ 3-6 tuổi; hở môi - vòm họng; trò chơi chỉnh âm.